



ADAPTATION FUND

AFB/PPRC.24-25/9
5 June, 2019

Adaptation Fund Board
Project and Programme Review Committee

PROPOSAL FOR TAJIKISTAN

Background

1. The Operational Policies and Guidelines (OPG) for Parties to Access Resources from the Adaptation Fund (the Fund), adopted by the Adaptation Fund Board (the Board), state in paragraph 45 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US\$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the endorsement of the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would ultimately require the Board's approval.

2. The Templates approved by the Board (Annex 5 of the OPG, as amended in March 2016) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.

3. The first four criteria mentioned above are:

- (i) Country Eligibility,
- (ii) Project Eligibility,
- (iii) Resource Availability, and
- (iv) Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:
(v) Implementation Arrangements.

5. It is worth noting that at the twenty-second Board meeting, the Environmental and Social Policy (ESP) of the Fund was approved and at the twenty-seventh Board meeting, the Gender Policy (GP) of the Fund was also approved. Consequently, compliance with both the ESP and the GP has been included in the review criteria both for concept documents and fully-developed project documents. The proposal template was revised as well, to include sections requesting demonstration of compliance of the project/programme with the ESP and the GP.

6. At its seventeenth meeting, the Board decided (Decision B.17/7) to approve "Instructions for preparing a request for project or programme funding from the Adaptation Fund", contained in the Annex to document AFB/PPRC.8/4, which further outlines applicable review criteria for

both concepts and fully-developed proposals. The latest version of this document was launched in conjunction with the revision of the Operational Policies and Guidelines in November 2013.

7. Based on the Board Decision B.9/2, the first call for project and programme proposals was issued and an invitation letter to eligible Parties to submit project and programme proposals to the Fund was sent out on April 8, 2010.

8. According to the Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

9. The following fully-developed project document titled “Integrated Landscape Approach to Enhancing the Climate Resilience of Small-scale Farmers and Pastoralists in Tajikistan” was submitted for Tajikistan by the United Nations Development Programme (UNDP), which is the Multilateral Implementing Entity of the Adaptation Fund.

10. This is the third submission of the proposal using the one-step submission process. It was first submitted to be considered in the thirty-second meeting but was withdrawn after the initial technical review. It was then submitted in the thirty-third meeting to be considered by the Board and the Board decided to:

- a) *Not approve the fully-developed project, as supplemented by the clarification responses provided by the United Nations Development Programme (UNDP) to the request made by the technical review;*
- b) *To suggest that UNDP reformulate the proposal, taking into account the observations in the review sheet annexed to the notification of the Board’s decision, as well as the following issues:*
 - (i) *The fully-developed proposal should submit a revised Environmental and Social Policy risk identification analysis including the significance of the risk identified (e.g. low, medium, high), the outcome of the screening process indicating the risks that may be triggered, as well the relevant environment and social assessments in compliance with the Adaptation Fund Environmental and Social Policy principles;*
 - (ii) *Since the priority list of ecosystem-based adaptation (EbA) sub-projects that constitute over US\$ 6 million of the budget have been identified, the assessments mentioned in Section V, Annex 4 (gender analysis, marginalized and vulnerable groups assessment, ecological and land use assessment, pasture use assessment and other relevant assessments) should be submitted along with the resubmitted proposal; and*
- c) *To request UNDP to transmit the observations under subparagraph b) above to the Government of Tajikistan.*

(Decision B.33/25)

11. The current submission was received by the secretariat in time to be considered in the thirty third -thirty fourth intersessional Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number TJK/MIE/Rural/2018/1 and completed a review sheet.

12. In accordance with a request to the secretariat made by the Board in its 10th meeting, the secretariat shared this review sheet with UNDP, and offered it the opportunity of providing responses before the review sheet was sent to the PPRC.

13. The secretariat is submitting to the PPRC the summary and, pursuant to decision B.17/15, the final technical review of the project, both prepared by the secretariat, along with the final submission of the proposal in the following section. In accordance with decision B.25.15, the proposal is submitted with changes between the initial submission and the revised version highlighted.

Project Summary

Tajikistan – An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan

Implementing Entity: United Nations Development Programme (UNDP)

Project/Programme Execution Cost: USD 776,000

Total Project/Programme Cost: USD 9,213,310

Implementing Fee: USD 783,131

Financing Requested: USD 9,996,441

[Project/Programme] Background and Context

The project is trying to address the problem of climate change induced negative impacts on livelihoods of small-scale rural farmers and pastoralists in the Kofirnighan River Basin (KRB).

The objective of the proposed project is to enhance the livelihoods of the small-scale farmers and pastoralists living in the Kofirnighan River Basin under future climate change conditions. It aims to make rural farmers and pastoralists climate resilient by developing and then implementing a climate-resilient catchment management strategy for the KRB, which will enhance the provision of ecosystem services in the river basin.

The project aims to tackle the considerable socio-economic impacts of climate change on vulnerable communities' livelihoods, agricultural productivity and water availability through the following components:

Component 1: Integrated catchment management to build climate resilience (USD 1,012,000)

The outcome under component 1 is to develop a catchment management strategy to manage climate risks operationalized at *raion* (district) and *jamoat* (sub-district) levels in Kofirnighan River Basin. Integrated land and water resources management principles will be introduced to Tajik authorities at the *raion* and *jamoat* levels to effectively address the climate change impacts. The integrated, climate-resilient catchment management strategy for the KRB will be developed using a multi hazard climate risk approach, which will detail the climate risk scenarios in each KRB watershed and will provide the *raion* and *jamoat* government levels with guidelines for managing these risks.

Outcome 1 will be achieved through five linked outputs: i) contribute towards improved transparency on multi-hazard climate risks throughout the KRB through risk modelling and improved climate data production; ii) develop a cross-sectoral strategy for managing these risks throughout the KRB by using an integrated catchment management approach; iii) strengthen the capacity of government bodies and local communities for managing climate risks by implementing EbA; and iv) strengthened coordination and training mechanisms for integrated climate-resilient catchment management and v) incentivize ecosystem management as a risk management approach by developing a framework for a Payment for Ecosystem Services (PES) approach

Component 2: Ecosystem-based Adaptation, including Climate Smart Agriculture and Sustainable Land Management, in agroecological landscapes (USD 7,282,810)

The integrated catchment management strategy developed under Outcome 1 will inform development across all economic sectors at a catchment scale in the KRB. It will not, however, be sufficiently detailed to inform land-use management practices at a watershed scale. Outcome under component 2 will consequently include the development and operationalizing of Watershed Action Plan (WAPs). These plans are expected to have an overarching focus on addressing climate risks, thereby ensuring full alignment with the catchment management strategy. Six target districts have been identified for EbA implementation.

Under this outcome, an integrated approach for building community resilience to climate change will be established, demonstrated and subsequently implemented. This approach will be informed by detailed WAPs and community enterprise plans that will focus on building the climate resilience of the communities. There are three interlinked outputs to achieve the above-described outcome by providing support to communities and implementing EbA activities in target regions. The outputs are: i) Agro-ecological extension services supported at the jamoat level to provide technical support for EbA implementation, ii) Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities, iii) EbA interventions implemented in target watersheds by local communities

Component 3: Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB (USD 142,500)

The integrated catchment management approach using EbA of the proposed project have significant upscaling potential throughout Tajikistan and in Central Asia. Consequently, lessons learned from this project will provide an evidence-base to both inform and promote project activities beyond the project's geographical scope. To ensure that lessons learned are adequately collected, collated and disseminated, this component intends to focus on strengthening knowledge management around integrated catchment management and EbA in Tajikistan.

There are two outputs to achieve the above-described outcome: i) Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions, ii) An impact evaluation framework established to enable effective adaptive management of EbA activities. These outputs are interlinked through the respective activities to ensure the necessary support is provided to knowledge sharing platforms to facilitate information transfer.



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Full Proposal

Country/Region: **Tajikistan/Asia Pacific**
 Project Title: **Integrated Landscape Approach to Enhancing the Climate Resilience of Small-scale Farmers and Pastoralists in Tajikistan**
 Thematic Focal Area: **Rural Development**
 Implementing Entity: **United Nations Development Programme (UNDP)**
 AF Project ID: **TJK/MIE/Rural/2018/1**
 IE Project ID: Requested Financing from Adaptation Fund (US Dollars): **USD 9,996,441**
 Reviewer and contact person: **Alyssa Gomes** Co-reviewer(s): **Saliha Dobardzic**
 IE Contact Person:

Review Criteria	Questions	Comments on 30, April 2019	UNDP Response
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes	
Project Eligibility	1. Has the designated government authority for the Adaptation	An endorsement letter dated 15 April 2019 and signed by Mr. Davlatshoh. Gulmahmadzoda , Chairman of the Committee for Environmental Protection Ministry of Foreign Affairs has	DA in Tajikistan has not changed, and the names listed in the

	Fund endorsed the project/programme?	<p>been attached.</p> <p>CR 1: The AF website and records indicate that the DA for Tajikistan is Mr. G.K. Gulmahmadzoda. Kindly clarify if the DA has changed. If so, this needs to be formally communicated to the Adaptation Fund. If this is the same person, kindly clarify.</p>	<p>comment is of the same person. A full name of the Designated Authority is Mr. Davlatshoh Kurbonalievich Gulmahmadzoda, he is the Chairman of the Committee for the Environmental Protection and NDA for AF and UNFCCC focal point.</p>
	2. Does the length of the proposal amount to no more than Fifty pages for the project/programme concept, including its annexes; or One hundred pages for the fully-developed project document, and one hundred pages for its annexes?	Yes	
	3. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the	Yes	

	adverse effects of climate change and build in climate resilience?		
	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	Yes	
	5. Is the project / programme cost effective?	Yes	
	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national	Yes	

	development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?		
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund??	Yes	
	8. Is there duplication of project / programme with other funding sources?	Yes	
	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes	
	10. Has a consultative process taken place, and has it involved all key stakeholders,	Yes	

	and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?		
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes	
	12. Is the project / program aligned with AF's results framework?	Yes	
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Yes	
	14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and	<p>Addressed. Table 12 in the project document has been updated to include a revised checklist of Environmental and Social risks, the significance of the risk identified and the relevant assessments that may be required based on the outcomes of the risk screening process. Annex 6 proposes mitigation measures corresponding to the risks that have been identified.</p> <p>The Project is ranked as Category B (Moderate) across all</p>	

	Gender Policy of the Fund?	components. The project does not foresee any high risk impacts against the environmental and social principles, and potential adverse impacts are less widespread, reversible and easily mitigated. Most impacts are likely to occur during the construction phase of EbA interventions.	
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes	
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes	
Implementation	1. Is there adequate	Yes	

Arrangements	arrangement for project / programme management, in compliance with the Gender Policy of the Fund?		
	2. Are there measures for financial and project/programme risk management?	Yes	
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	<p>Since the priority list of EbA sub-projects that constitute over USD 6 million of the budget, the following targeted assessments identified by the proponent for sub-projects were requested:</p> <ul style="list-style-type: none"> • <u>Gender analysis</u> in the initial phase of the project to assess divisions of labor and women’s role and access to resources in order to develop recommendations on how the project will promote women’s equality and empowerment. • <u>Marginalized and vulnerable groups assessment</u> in the project inception to prioritize communities and groups for adaptation interventions. • <u>Ecological and land use assessment</u> to evaluate the rate of success of the forest restoration activities. • <u>Pasture use assessment</u> with indication of degree of degradation, over-grazing, and successful experience in pasture restoration activities across the country.” <p>Addressed. The following additional Annexes have been appended to the revised document.</p> <ul style="list-style-type: none"> - <u>Annex 12: “Marginalized and vulnerable groups/Gender Analysis: Prioritization of vulnerable communities and groups for climate change adaptation</u> 	

		<p>interventions in selected districts of Kafernigan River Basin” (UNDP, 2019);</p> <ul style="list-style-type: none"> - <u>Annex 13: Project’s “Land Use and Climate Change: Restoration of forests and pastures in Kafernigan River Basin: Lessons learned, good practices and recommendations for selected districts”</u>. (UNDP, 2019) <p>Grievance mechanism - details on the grievance mechanism outlined for the project in Annex 4.</p> <p>M&E for ESP/G risks, mitigation measures – provided in Table 2 and Table 6 of Annex 4. Including table 6 on page 54 – 55 of implementation and operation in Annex 4.</p>	
	4. Is a budget on the Implementing Entity Management Fee use included?	Yes	
	5. Is an explanation and a breakdown of the execution costs included?	Yes	
	6. Is a detailed budget including budget notes included?	<p>Yes, a work plan and detailed budget has been included in Annex 10 and Annex 11.</p> <p>CAR 1: Kindly also attach the tables in Annex 10 and 11 in the main project document in Section III G. When attaching the two tables please also include a row indicating the management fees. The grand total in the detailed budget should then reflect the total requested amount \$ 9,996,441.</p>	As requested, the tables in Annexes 10 and 11 have now been included in the main document under G section. And entity fee rows added to the tables.
	7. Are arrangements for monitoring and evaluation clearly	Yes.	

	defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?		
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes.	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	Yes.	
	10. Is a disbursement schedule with time-bound milestones included?	Yes.	

Technical Summary	The resubmitted project titled, "An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan", is trying to address the problem of climate change induced negative
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	<p>impacts on livelihoods of small-scale rural farmers and pastoralists in the Kofirnighan River Basin (KRB). It aims to make rural farmers and pastoralists climate resilient by developing and then implementing a climate-resilient catchment management strategy for the KRB, which will enhance the provision of ecosystem services in the river basin.</p> <p>The project proposal aims to tackle the considerable socio-economic impacts of these changes on vulnerable communities' livelihoods, agricultural productivity and water availability through the following components: <u>Component 1:</u> Integrated catchment management to build climate resilience <u>Component 2:</u> Ecosystem-based Adaptation, including Climate Smart Agriculture and Sustainable Land Management, in agro-ecological landscapes. <u>Component 3:</u> Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.</p> <p>The initial technical review finds that UNDP has addressed the issues raised during the previous review cycle and the resubmitted project document has updated the ESP risk screening tool and submitted the requested assessments.</p> <p>There is one pending clarification related to the Designated Authority that requires the proponent's attention and one additional corrective action related to appending the Project Workplan and Detailed budget to the main document under Section III. G.</p>
Date:	5/1/2019



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Full Proposal

Country/Region: **Tajikistan/Asia Pacific**
 Project Title: **Integrated Landscape Approach to Enhancing the Climate Resilience of Small-scale Farmers and Pastoralists in Tajikistan**
 Thematic Focal Area: **Rural Development**
 Implementing Entity: **United Nations Development Programme (UNDP)**
 AF Project ID: **TJK/MIE/Rural/2018/1**
 IE Project ID: _____ Requested Financing from Adaptation Fund (US Dollars): **USD 9,996,441**
 Reviewer and contact person: **Alyssa Gomes** Co-reviewer(s): **Saliha Dobardzic**
 IE Contact Person: _____

Review Criteria	Questions	Comments on 30, April 2019	Comments on 20, May 2019
Country Eligibility	3. Is the country party to the Kyoto Protocol?	Yes	
	4. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes	
Project Eligibility	15. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	An endorsement letter dated 15 April 2019 and signed by Mr. Davlatshoh. Gulmahmadzoda , Chairman of the Committee for Environmental Protection Ministry of Foreign Affairs has been	CR 1: Addressed. DA in Tajikistan has not changed, and the names listed in the comment is of the same person. The full name of the

		<p>attached.</p> <p>CR 1: The AF website and records indicate that the DA for Tajikistan is Mr. G.K. Gulmahmadzoda. Kindly clarify if the DA has changed. If so, this needs to be formally communicated to the Adaptation Fund. If this is the same person, kindly clarify.</p>	<p>Designated Authority is Mr. Davlatshoh Kurbonalievich Gulmahmadzoda, Chairman of the Committee for the Environmental Protection and NDA for AF and UNFCCC focal point.</p>
	<p>16. Does the length of the proposal amount to no more than Fifty pages for the project/programme concept, including its annexes; or One hundred pages for the fully-developed project document, and one hundred pages for its annexes?</p>	<p>Yes</p>	
	<p>17. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?</p>	<p>Yes</p>	
	<p>18. Does the project / programme provide</p>	<p>Yes</p>	

	economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?		
	19. Is the project / programme cost effective?	Yes	
	20. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other	Yes	

	relevant instruments?		
	21. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund??	Yes	
	22. Is there duplication of project / programme with other funding sources?	Yes	
	23. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	Yes	
	24. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the	Yes	

	Environmental and Social Policy and Gender Policy of the Fund?		
	25. Is the requested financing justified on the basis of full cost of adaptation reasoning?	Yes	
	26. Is the project / program aligned with AF's results framework?	Yes	
	27. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	Yes	
	28. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	<p>Addressed. Table 12 in the project document has been updated to include a revised checklist of Environmental and Social risks, the significance of the risk identified and the relevant assessments that may be required based on the outcomes of the risk screening process. Annex 6 proposes mitigation measures corresponding to the risks that have been identified.</p> <p>The Project is ranked as Category B (Moderate) across all components. The project does not foresee any high risk</p>	

		impacts against the environmental and social principles, and potential adverse impacts are less widespread, reversible and easily mitigated. Most impacts are likely to occur during the construction phase of EbA interventions.	
Resource Availability	5. Is the requested project / programme funding within the cap of the country?	Yes	
	6. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes	
	7. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes	
Eligibility of IE	8. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes	

Implementation Arrangements	11. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	Yes	
	12. Are there measures for financial and project/programme risk management?	Yes	
	13. Are there measures in place for the management of environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	<p>Since the priority list of EbA sub-projects that constitute over USD 6 million of the budget, the following targeted assessments identified by the proponent for sub-projects were requested:</p> <ul style="list-style-type: none"> • <u>Gender analysis</u> in the initial phase of the project to assess divisions of labor and women's role and access to resources in order to develop recommendations on how the project will promote women's equality and empowerment. • <u>Marginalized and vulnerable groups assessment</u> in the project inception to prioritize communities and groups for adaptation interventions. • <u>Ecological and land use assessment</u> to evaluate the rate of success of the forest restoration activities. • <u>Pasture use assessment</u> with indication of degree of degradation, over-grazing, and successful experience in pasture restoration 	

		<p>activities across the country.”</p> <p>Addressed. The following additional Annexes have been appended to the revised document.</p> <ul style="list-style-type: none"> - <u>Annex 12: “Marginalized and vulnerable groups/Gender Analysis: Prioritization of vulnerable communities and groups for climate change adaptation interventions in selected districts of Kafernigan River Basin”</u> (UNDP, 2019); - <u>Annex 13: Project’s “Land Use and Climate Change: Restoration of forests and pastures in Kafernigan River Basin: Lessons learned, good practices and recommendations for selected districts”</u>. (UNDP, 2019) <p>Grievance mechanism - details on the grievance mechanism outlined for the project in Annex 4.</p> <p>M&E for ESP/G risks, mitigation measures – provided in Table 2 and Table 6 of Annex 4. Including table 6 on page 54 – 55 of implementation and operation in Annex 4.</p>	
	14. Is a budget on the Implementing Entity Management Fee use included?	Yes	
	15. Is an explanation and a breakdown of	Yes	

	the execution costs included?		
	16. Is a detailed budget including budget notes included?	<p>Yes, a work plan and detailed budget has been included in Annex 10 and Annex 11.</p> <p>CAR 1: Kindly also attach the tables in Annex 10 and 11 in the main project document in Section III G. When attaching the two tables please also include a row indicating the management fees. The grand total in the detailed budget should then reflect the total requested amount \$ 9,996,441.</p>	<p>CAR 1: Addressed.</p> <p>The tables from Annexes 10 and 11 related to budget breakdown of activities have now been included in the main document under G section. Entity fee rows added to the tables.</p>
	17. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	Yes.	
	18. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	Yes.	
	19. Does the	Yes.	

	project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?		
	20. Is a disbursement schedule with time-bound milestones included?	Yes.	

Technical Summary	<p>The resubmitted project titled, "An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan", is trying to address the problem of climate change induced negative impacts on livelihoods of small-scale rural farmers and pastoralists in the Kofirnighan River Basin (KRB). It aims to make rural farmers and pastoralists climate resilient by developing and then implementing a climate-resilient catchment management strategy for the KRB, which will enhance the provision of ecosystem services in the river basin.</p> <p>The project proposal aims to tackle the considerable socio-economic impacts of these changes on vulnerable communities' livelihoods, agricultural productivity and water availability through the following components:</p> <p><u>Component 1:</u> Integrated catchment management to build climate resilience</p> <p><u>Component 2:</u> Ecosystem-based Adaptation, including Climate Smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.</p> <p><u>Component 3:</u> Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.</p> <p>The initial technical review found that UNDP has addressed the issues raised during the previous review cycle and the resubmitted project document has updated the ESP risk screening tool and submitted the requested assessments.</p> <p>There was one pending clarification related to the Designated Authority that required the proponent's attention</p>
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	<p>and one additional corrective action related to appending the Project Workplan and Detailed budget to the main document under Section III. G.</p> <p>The final technical review finds that the pending issues have been adequately addressed in the revised proposal.</p>
Date:	5/20/2019



ADAPTATION FUND

**REQUEST FOR PROJECT
FUNDING FROM THE ADAPTATION FUND**

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project must be fully prepared (i.e. fully appraised for feasibility) when the request is submitted. The final project document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A.
Fax: +1 (202) 522-3240/5
Email: afbsec@adaptation-fund.org

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LIST OF ACRONYMS AND ABBREVIATIONS

Adaptation Strategy	Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects
ADB	Asian Development Bank
AF	Adaptation Fund
AFA	Administrative/Finance Assistant
ALRI	Agency for Land Reclamation and Irrigation
AWP	Annual Work Plan
BCPR	Bureau for Crisis Prevention and Recovery
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CAC	Central Asia and the Caucasus
CACAARI	Central Asia and the Caucasus Association of Agricultural Research Institutions
CA-CRM	Central Asian Multi-Country Programme on Climate Risk Management
CAFT	Climate adaptation through sustainable forestry in important river catchment areas in Tajikistan
CAREC	Central Asian Regional Economic Cooperation
CBD Strategy	National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity
CBOs	Community-based organisations
CCA	Climate change adaptation
CDP	Combined Delivery Report
CEP	Committee for Environmental Protection
CGIAR	Consultative Group on International Agricultural Research
CIA	Central Intelligence Agency
CSA	Climate-smart Agriculture
DDPs	District Development Plans
DoG	Department of Geology
DRMP	UNDP Disaster Risk Management Programme
DRR	Disaster risk reduction
EDB	Eurasian Development Bank
EbA	Ecosystem-based Adaptation
EIAs	Environmental Impact Assessments
EPs	Enterprise Plans
ESMF	Environmental and Social Management Framework
ESP	March 2016 Revision of the Environmental and Social Policy of the Adaptation Fund
FAO	The Food and Agriculture Organisation of the United Nations
FFSs	Farmer Field Schools
GBAR	Gorno-Badakhshan Autonomous Region
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gas
GHG Strategy	Greenhouse Gas Abatement Strategy
GINA	Global Database on the Implementation of Nutrition Action

GIZ	<i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i>
GLOFs	Glacial lake outburst floods
GoT	Government of Tajikistan
Hydromet	State Agency for Hydrometeorology
ICAS	Initiatives in Critical Agrarian Studies
ICARDA	International Center for Agricultural Research in the Dry Areas
ICR	Intelligent Character Recognition
IDA	International Development Association
IDS	Institute for Development Studies
IEF	Impact evaluation framework
ILO	International Labour Organisation
IMCC	Inter-Ministerial Coordination Council
IMS	Information Management Systems
INDC	Intended Nationally Determined Contribution
ISS	International Institute of Social Studies
IW	Inception Workshop
IWRM	Integrated Water Resources Management
KRB	Kofirnighan River Basin
KRBMP	Kafirnigan River Basin Plan and Management Plan
LITACA	Livelihood Improvement in Tajik-Afghan Cross-border Areas
LSIS	Living Standards Improvement Strategy of Tajikistan for 2013–2015
LUP	Land-use planning
M&E	Monitoring and evaluation
Masl	Metres above sea level
MEWR	Ministry of Energy and Water Resources
MFI	Microfinance institutions
MHCRM	Multi-Hazard Climate Risk Model
MLRWR	Ministry of Land Reclamation and Water Resources
MTDP	Mid-term Development Programme 2016–2020
MTR	Mid-term Review
NAPCC	National Action Plan of Tajikistan for Climate Change
NCCAS	National Climate Change Adaptation Strategy Tajikistan: Building Capacity for Climate Resilience
NDRMS	National Strategy on Disaster Risk Management for 2010–2015
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NHDR	National Human Development Report
NIM	National Implementation Modality
NPACD	National Programme of Actions to Combat Desertification
NPC	National Project Coordinator
NPD	National Project Director
OCSE	Organisation for Security and Cooperation in Europe
PES	Payment for Ecosystem Services
PGRFA	Plant Genetic Resources for Food and Agriculture
PLAAS	Institute for Poverty, Land and Agrarian Studies
PM	Programme Manager
PPCR	Pilot Programme for Climate Resilience
PPR	Project Progress Report
PRISE	Pathways to Resilience in Semi-arid Countries
PRS	Poverty Reduction Strategy
PSC	Project Steering Committee

PUUs	Pasture User Unions
Ramsar Convention	Convention on Wetlands of International Importance especially as Waterfowl Habitat
RBCs	River Basin Councils
RBOs	River Basin Organisations
DRS	Districts of Republican Subordination
SDC	Swiss Agency for Development and Cooperation
SIDA	Swedish International Development Cooperation Agency
SIWI	Stockholm International Water Institute
SLM	Sustainable Land Management
SPCR	Strategic Program for Climate Resilience
TJS	Tajikistan Somoni
ToT	Training-of-Trainers
TR	Terminal Review
UCA	University of Central Asia
UN Environment/ UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
Watershed	In this document, the smallest hydrological unit for management of land and water resources
WAPs	Watershed Action Plans
Water Reform Programme	Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025
WB	World Bank
WBG	World Bank Group
WHO	World Health Organisation
WMO	World Meteorological Organization
WUAs	Water User Associations



ADAPTATION FUND

PROJECT PROPOSAL TO THE ADAPTATION FUND**PART I: PROJECT INFORMATION**

Project Category:	Regular Project
Country/ies:	Tajikistan
Title of Project	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	UNDP
Executing Entity/ies:	Committee for Environmental Protection (CEP)
Amount of Financing Requested:	US\$ 9,996,441

PROJECT BACKGROUND AND CONTEXT:**Introduction**

The Republic of Tajikistan (hereafter Tajikistan) is the most climate-vulnerable country in Central Asia. Extreme rainfall events have become more frequent and intense, the rainfall season has shortened in many parts of the country, air temperatures have risen markedly, and glacial melting is accelerating¹. As a result, hydrometeorological disasters such as droughts, floods, mudflows and landslides are more frequent and rates of soil erosion across the country are increasing. The socio-economic impacts of these changes are considerable: livelihoods, agricultural productivity, water availability and hydroelectricity production are all compromised². Indeed, natural hazards, most of which are linked to climate change (e.g. droughts and landslides), result in annual losses equivalent to ~20% of the country's Gross Domestic Product (GDP)³.

The vulnerability of Tajikistan to climate change is exacerbated by a low adaptive capacity as a result of ageing infrastructure, the disproportionate number of women in poverty compared with men⁴, and limited institutional

¹ Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change. 2014. Committee on Environmental Protection, State Administration for Hydrometeorology, Government of The Republic of Tajikistan.

² World Bank (WB). 2013. Tajikistan: Overview of climate change activities.

³ WB 2013 Tajikistan: Overview.

⁴ This phenomenon is referred to as the 'feminisation of poverty', where women bear the burden of poverty – particularly in developing countries – as a result of lack of income and gender biases.

capacity. This vulnerability is expected to intensify in the future, and consequently the building of climate resilience across the country is of paramount importance⁵.

Given the above context, the proposed Adaptation Fund (AF) project will introduce an integrated approach to landscape management to develop the climate resilience of rural communities in Tajikistan. The proposed project's activities will focus in particular within one of the most climate-vulnerable river basins, namely the Kofirnighan River Basin (KRB). An integrated catchment management strategy will be developed for this basin which will be operationalised at *raion* (district), *jamoat* (sub-district) and village levels⁶. The strategy will provide detailed guidelines for suitable landscape management interventions to reduce the vulnerability to climate change. Important principles underpinning the strategy will include: i) climate risks will need to be managed at a range of spatial scales (catchment and watershed⁷); ii) upstream-downstream interactions at different time scales (e.g. via glacial lake outburst floods, flooding and soil erosion) will need to be understood by planners and decision-makers in the KRB; iii) long-term development plans for the KRB will need to include a focus on climate risk management; iv) a cross-sectoral and integrated approach for managing water resources, forests, pasture land and agricultural land at the watershed level will be required to build climate resilience; v) landscape management interventions will need to focus on Ecosystem-based Adaptation (EbA), which will invariably include elements of both Sustainable Land Management (SLM) and Climate-smart Agriculture (CSA) practices; and vi) existing knowledge management platforms and hubs will need to be used to present lessons learnt within the KRB for promoting future national upscaling and replication of the project's activities.

Complementing the catchment management strategy, the proposed project will directly build the resilience of selected communities by: i) implementing on-the-ground EbA; ii) supporting agro-ecological extension services to provide technical assistance on climate change adaptation practices to local community members; iii) promoting the development of business models that capitalise on EbA interventions; and iv) developing a Payment for Ecosystem Services (PES) approach to support the long-term financing of climate-resilient catchment management plans across Tajikistan.

Geographical context

Tajikistan is a small, landlocked country bordered by China to the east, the Kyrgyz Republic to the north, Afghanistan to the south and Uzbekistan to the north-west. The total land area of the country is 142,600 km², making it the smallest of all the Central Asian countries^{8,9}. Over 90% of the land is mountainous terrain, with approximately half the country being more than 3,000 metres above sea level (masl). The topography of the country is extremely steep, with elevations ranging from 300–7,495 masl (Figure 1). This elevation range has resulted in a significant inter-seasonally and regionally variable climate. Elevation also influences the mean annual temperature, which ranges from -20°C–30°C, depending on the region. Similarly, mean annual precipitation varies geographically, ranging from ~30–1,800 mm per annum, and occurring mostly during a unimodal rain season that lasts ~7 months.

The mountainous regions of Tajikistan are of global importance as a glacial area. Approximately, 60% of the total number of glaciers in Central Asia are located within the country. Together, these glaciers make up ~6% of Tajikistan's land area and are important water reserves, storing ~406 km³ of water and contributing to between 40 and 60% of the national renewable freshwater resources¹⁰. Two principle mountain ranges in Tajikistan – namely, the Pamir and Alay – give rise to several glacial-fed streams and rivers that are used to irrigate large areas of farmlands. Increased intensity of glacier melting is likely to lead to significant changes in the hydrological system

⁵ WB 2013 Tajikistan: Overview.

⁶ The administration delineations are explained in the following sub-section on the socio-economic context of Tajikistan.

⁷ The terms 'catchment' or 'basin' refer to a portion of land drained by a river and its tributaries, and are used interchangeably throughout this document. Catchments/basins can be subdivided into 'watersheds' i.e. areas of land around a smaller river, stream or lake.

⁸ Third National Communication 2014.

⁹ The total land surface areas of the remaining four Central Asia countries, in order of increasing size, are: i) Kyrgyzstan at 199,900 km²; ii) Uzbekistan at 448,978 km²; iii) Turkmenistan at 491,210 km²; and iv) Kazakhstan at 2,725,000 km².

¹⁰ United Nations Economic Commission for Europe (UNECE). 2017. Environmental Performance Review: Tajikistan, Third Review.

and a greater risk of water-related natural disasters, such as floods and mudflows¹¹. Over the last decade, water-related natural disasters have cost the Government of Tajikistan (GoT) more than US\$1 billion and have resulted in the loss of hundreds of lives¹².

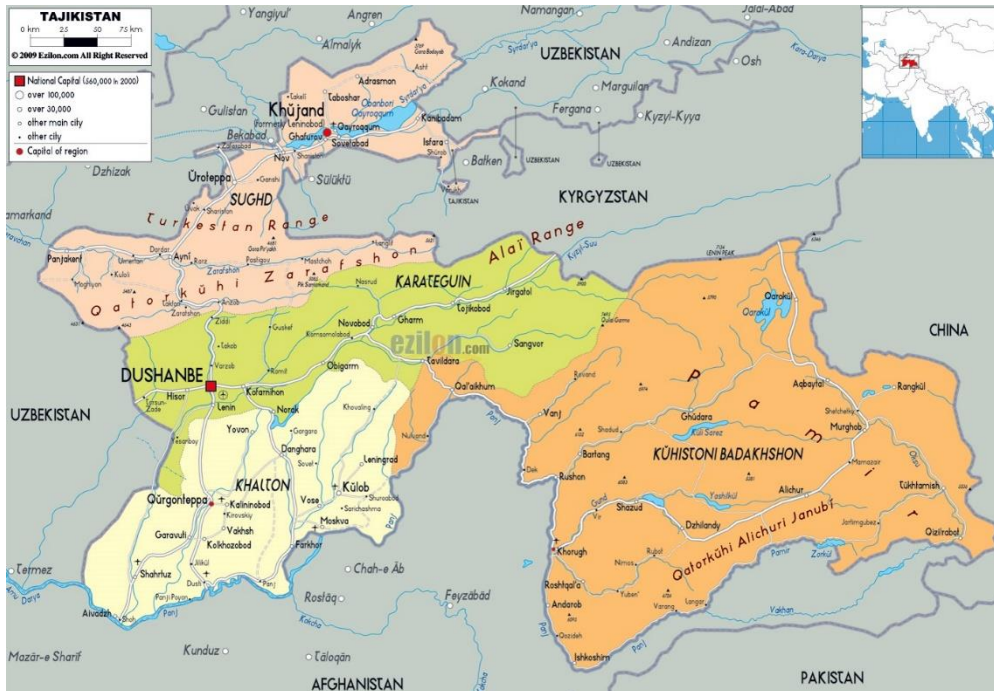


Figure 1. Map showing the five administrative regions of Tajikistan, namely Sughd, Khatlon, Districts of Republican Subordination (DRS) (previously known as Karategin Region), Badakhshan and Dushanbe^{13,14}.

Tajikistan's water resources are an integral contributor to the local economy, specifically for the agricultural and energy sector. Irrigation agriculture and livestock farming account for over 90% of annual water withdrawals, primarily from surface water sources. Despite this disproportionate water resource allocation to the agricultural sector, Tajikistan only develops 700–1,200 ha of land for irrigation annually. This amount is ~10 times less than what was planned in the Water Sector Development Strategy for 2010–2025¹⁵. Such slow progress in irrigating agricultural land is attributed to insufficient investment into the agricultural sector and has resulted in the country needing to import ~50% of most of its staple foods.

Socio-economic context

Tajikistan has a rapidly growing population, which at present numbers ~8.35 million¹⁶. Most people live in rural areas and are heavily dependent on agriculture for their livelihoods. Between 2005 and 2014, the population

¹¹ Pathways to Resilience in Semi-Arid Countries (PRISE). 8 September 2018. "COMMENT: Tajikistan's glaciers melting – far more than just a loss of ice". Available at: <http://prise.odi.org/comment-tajikistans-glaciers-melting-far-more-than-just-a-loss-of-ice/> [accessed 03.07.2018].

¹² PRISE 2018 "Tajikistan's glaciers melting".

¹³ The five administrative regions of Tajikistan are: i) Sugd *oblast*; ii) Khatlon *oblast*; iii) Gorno-Badakhshan *oblast*; iv) Regional Republic Subordination (RRS) – which consists of 13 autonomous districts; and v) Dushanbe.

¹⁴ Maps of the world. 2016. Maps of Tajikistan. Available at: <http://www.maps-of-the-world.net/maps-of-asia/maps-of-tajikistan/> [accessed 03.07.2018].

¹⁵ Water Sector Development Strategy for 2010–2025. 2009. Ministry of Land Reclamation and Water Resources (MLRWR) & Organisation for Security and Cooperation in Europe (OSCE), Dushanbe, Tajikistan.

¹⁶ UN DESA/Population Division. 2017. World Population Prospects 2017. Available at: <https://esa.un.org/unpd/wpp/Graphs/DemographicProfiles/> [accessed 03.07.2018].

increased by ~22%¹⁷. Unlike many other countries globally, this rapid growth has not led to increased urbanisation. Indeed, the proportion of rural (~73%) to urban residents (~27%) has remained relatively constant since 2005¹⁸.

The economy of Tajikistan is relatively weak compared with neighbouring countries – having the lowest per capita GDP (of ~US\$970) in the United Nations Economic Commission for the Europe (UNECE) region. There has, however, been continuous growth in GDP over the last 20 years¹⁹, with a total increase of 100% between 1998 and 2018. This growth has significantly improved the living standards of the population, resulting in a decrease in the number of people living below the poverty line from 53% to 36%²⁰.

Current socio-economic development trends in Tajikistan are closely connected to growth in the agricultural sector. This is because agriculture accounts for 75% of total employment and 23% of GDP, despite only 7% of the land surface being classified as arable. Cotton farming makes up the majority of the sector and is Tajikistan's main agricultural export product. Other agricultural focal areas include rice, grain, tobacco, corn, potato, vegetables, horticulture, vineyards and cattle breeding²¹. Like in other Central Asian countries, agricultural productivity showed a marked decline during the transition period from the Soviet Regime to independence²², with productivity levels dropping ~50% by 1997²³. By 2007, agricultural productivity in the country had, however, almost recovered to pre-transition levels, with the quantity of agricultural produce doubling again between 2005 and 2014²⁴.

Given the mountainous terrain of the country, transportation networks are integral to economic development²⁵ because they provide links to markets for multiple sectors, including agriculture. The main economic sectors in Tajikistan are, however, severely at risk from extreme climate events, particularly glacial lake outburst floods (GLOFs) and avalanches. GLOFs pose the most significant large-scale risk to transport networks – and consequently many other sectors – because of their unpredictability and the extent of affected area²⁶. These events often cause extensive damage to trade networks, making them extremely detrimental to the economy²⁷. In addition, both sudden and slow onset flooding events can cause landslides that have major negative impacts on the population²⁸.

Administrative delineations

The administrative division of the country is established by its parliament and consists of three tiers of local government. These tiers are described below.

- First tier: sub-district- or *jamoat*-level. These are village and town governments in rural areas.
- Second tier: district- or *raion*-level. These are the administrations of large cities and *raions* which are subordinate to *oblasts*.
- Third tier: *oblast*-level. These are the administrations of the capital city Dushanbe, as well as the *oblasts* of the Gorno-Badakhshan Autonomous Region (GBAR), Khatlon and Sougd, all of which are directly subordinate to the national government.

There are also District of Republican Subordination (DRS) which cover districts of Rasht and Gissar Valleys as well as those around the city of Dushanbe.

¹⁷ UNECE 2017 Environmental Performance Review.

¹⁸ Ibid.

¹⁹ Trading Economics. 2018. Tajikistan GDP per capita. Available at: <https://tradingeconomics.com/tajikistan/gdp-per-capita> [accessed 03.07.2018].

²⁰ UNECE 2017 Environmental Performance Review.

²¹ National Action Plan of Tajikistan for Climate Change Mitigation (NAPCC). 2003. Main Administration on Hydrometeorology and Environmental Pollution Monitoring Ministry for Nature Protection of the Republic Tajikistan, Dushanbe.

²² causes include the Tajik Civil War, removal of the centralised Soviet infrastructure and limited agricultural expertise

²³ Lerman Z. 2007. Tajikistan: An overview of land and farm structure reforms. The Hebrew University of Jerusalem. Discussion Paper 208.

²⁴ UNECE 2017 Environmental Performance Review.

²⁵ NAPCC 2003.

²⁶ Monhanty A, Mishra M, Mohanty B & BalaSuddareshwara A. 2011. Climate changes and natural hazards in mountain areas. Mountain Hazards 2011. Dushanbe, Tajikistan.

²⁷ The World Bank (WB). 13 September 2017. Strengthening infrastructure in Tajikistan for disaster and climate resilience. Available at: <http://www.worldbank.org/en/news/feature/2017/09/04/strengthening-infrastructure-in-tajikistan-for-disaster-and-climate-resilience> [accessed 03.07.2018].

²⁸ WB 2017 Strengthening infrastructure in Tajikistan.

Tajikistan's capital city, Dushanbe, has 4 city districts, while the country's three *oblasts* have 58 rural districts between them. The GBAR is subdivided into 7 *raions* and 1 city; Sougd into 14 *raions* and 8 cities; and Khatlon into 24 *raions* and 4 cities²⁹. Each *oblast*, *raion* and city has its own *khukumat*, or local council, with a chairperson who is appointed by the president and approved by respective council members. Local councils of second- and third-tier governments exercise the rights of self-government in their respective territories. Their decisions are legally binding for all institutions and organisations within their territories. Legislation does not address local self-government activity below the level of villages and towns. However, grassroots organisations of community self-government, such as *Mahala* committees are widespread and often exercise limited autonomy in solving local issues³⁰.

Environmental context

Tajikistan is situated at the confluence of several diverse biogeographic regions. Influenced by variable weather patterns, these regions host a wide range of ecosystems, including glaciers, forests, woodlands, rangelands (steppe and grasslands), semi-deserts, deserts and wetlands^{31,32}. The country is part of the Central Asia biodiversity hotspot³³, which supports a rich diversity of flora and fauna³⁴. Ecosystems in Tajikistan are home to more than 23,000 plant species (of which ~8% are endemic) and more than 13,500 animal species (of which ~6% are endemic)³⁵. Mountain ecosystems, situated between 600 and 7,000 masl, contain ~80% of the country's biodiversity and have high levels of endemism³⁶. These mountain ecosystems also provide essential water resource services to their respective regions and to most of the country's summer pastures.

Tajikistan's 142,600 km² total land area is comprised of diverse ecosystems that support a range of land uses and resources, including:

- ~3% forests and shrublands;
- ~5% intensively-used arable land;
- ~32% agricultural lands, predominantly pastures; and
- ~60% natural (non-agricultural) areas, including glaciers, snowfields, well-vegetated mountain slopes, mountain deserts and rock/pebble fields³⁷.

Of Tajikistan's total land area³⁸, ~3.1 million hectares (~22%) is currently conserved³⁹. Conservation areas within Tajikistan are formally recognised in the form of reserves and environmental protection zones^{40,41,42}. Five wetlands are listed in terms of the Ramsar Convention⁴³ and one conservation area has been declared a United Nations Educational, Scientific and Cultural Organisation (UNESCO) world heritage site⁴⁴. Despite these conservation

²⁹ Ilolov M & Khudoiyev M. 2001. Local government in Tajikistan. In: Munteanu I (ed.) Developing New Rules in the Old Environment. Local Governments in Eastern Europe, in the Caucasus and in Central Asia. Budapest: Open Society Institute 603–648.

³⁰ Ilolov & Khudoiyev 2001 Local government in Tajikistan.

³¹ Squires VR & Safarov N. 2013. Diversity of plants and animals in mountain ecosystem in Tajikistan. Journal of Rangeland Science 43–61.

³² National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (CBD Strategy). 2003. Government of Republic of Tajikistan, Dushanbe.

³³ Fauna and Flora International. 2018. "Tajikistan: Wild riches in a mountainous terrain". Available at: <https://www.fauna-flora.org/countries/tajikistan> [accessed 03.07.2018].

³⁴ World Wide Fund for Nature (WWF). 2018. Central Asia: Kyrgyzstan, Tajikistan, and Uzbekistan. Available at: <https://www.worldwildlife.org/ecoregions/pa0808> [accessed 03.07.2018].

³⁵ CBD Strategy 2003.

³⁶ Squires & Safarov. 2013.

³⁷ NAPCC 2003.

³⁸ Third National Communication 2014.

³⁹ Third National Communication 2014.

⁴⁰ 4 reserves, 2 national parks and 13 wildlife reserves

⁴¹ Third National Communication 2014.

⁴² The Food and Agriculture Organisation of the United Nations (FAO). 2008. Country Report on the State of Plant Genetic Resources for Food and Agriculture. Republic of Tajikistan.

⁴³ Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). 1971. UN Treaty Series No. 14583. As amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987.

⁴⁴ Third National Communication 2014.

efforts, degradation continues to occur over large parts of the country⁴⁵. Illegal poaching and uncontrolled harvesting of plant species are of particular concern within the reserves and protection zones. Because there is such rich diversity in the country⁴⁶, the extinction risk to biodiversity is also high, with 226 plant species and 162 animal species currently classified as rare or threatened⁴⁷. Expanding protected areas and eliminating threats to species extinction are focal areas for the GoT going forward^{48,49}.

Most territories of Tajikistan are prone to both natural and anthropogenic factors that contribute to land degradation (Figure 2). Tajik landscapes are affected by harsh climatic processes which degrade their health and function. Such harsh processes include freezing, thawing, physical destruction of soils from fluctuations in diurnal temperatures, dehydration, wind erosion and intense rainfall events⁵⁰. Inappropriate land management such as the unsustainable use of forests and pastures, and the conversion of steep slopes for use in agriculture have contributed to the degradation of landscapes⁵¹. The effects of the harsh climatic processes coupled with the mismanagement of land are magnified by climate change factors.

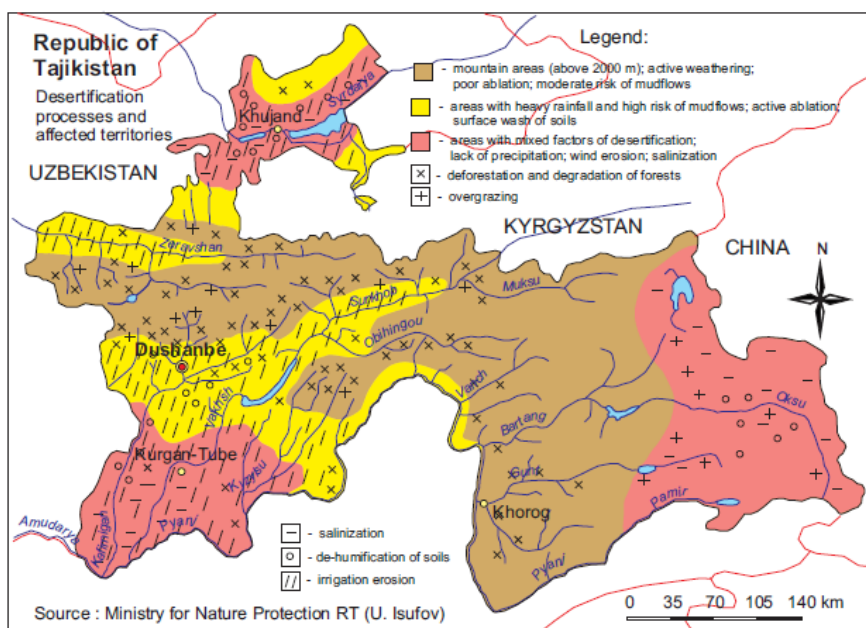


Figure 2. Desertification processes and territories in Tajikistan affected by *inter alia*: i) moderate risk of mudflows (brown); ii) high risk of mudflows, heavy rainfall and surface wash of soils (yellow); iii) desertification, lack of precipitation, wind erosion, salinization (pink); iv) deforestation (x); v) overgrazing (+); vi) salinisation (-); and vii) de-humification of soils (o).⁵²

These factors include increasing air temperatures, increasing intensity of extreme rainfall events and the shortening of rainfall seasons. Climate change events have also resulted in the intensification of desertification, landslides, gully erosion and sheet erosion – with the washout of fertile topsoil affecting more than 100,000 ha^{53,54}. Available estimates indicate that ~82% of all land in Tajikistan is degraded by soil erosion to some degree. This translates into

⁴⁵ FAO 2008 Country Report.

⁴⁶ Fauna and Flora International 2018 “Tajikistan: Wild riches in a mountainous terrain”.

⁴⁷ CBD Strategy 2003.

⁴⁸ e.g. Tajikistan’s national programmes on biodiversity and biosafety

⁴⁹ FAO 2008 Country Report.

⁵⁰ NAPCC 2003.

⁵¹ Third National Communication 2014.

⁵² NAPCC 2003.

⁵³ NAPCC 2003.

⁵⁴ Third National Communication 2014.

~98% of agricultural land being currently affected by soil erosion, with almost ~89% being affected by medium to ‘very high’ levels of erosion⁵⁵.

River systems

The terrain of Tajikistan has been eroded to form a diverse range of mountains and steep valleys. The country’s mountain ranges create several hydrographic areas, which in turn form the two main river systems. These two rivers feed into six primary rivers across the country. In order of decreasing size and length, these six rivers are: i) Bartang; ii) Vahksh; iii) Pyanj; iv) Kofirnighan; v) Zarafshan; and vi) Karatag. [Figure 3](#) illustrates the river basins in Tajikistan.

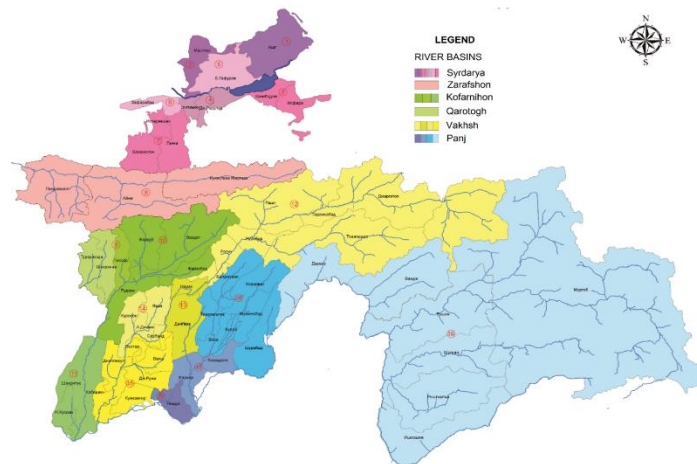


Figure 3. Map of river basins in Tajikistan, namely Bartang (labelled as Surdarya), Vakhsh, Pyanj, Kofirnighan, Zarafshan and Karatag⁵⁶.

The Water Sector Reform Programme of Tajikistan for 2016–2025 (Water Reform Programme)⁵⁷ delineates four river basins according to hydrological boundaries. These four basins are the: i) section of the Syr Darya River that is located in Tajikistan; ii) section of the Pyanj River located in Tajikistan; iii) Vakhsh River Basin; and iv) the Kofirnighan River Basin.⁵⁸ By defining these river basins, the Water Reform Programme highlights the shift in the GoT towards improving management of these river systems away from using administrative boundaries. The programme also outlines the GoT’s goal of promoting the implementation of integrated water resources management (IWRM) at a basin level.

Of the four river basins identified by Tajikistan’s Water Reform Programme, the Kofirnighan River Basin (KRB) is one that currently does not have focused efforts being made towards IWRM⁵⁹. Compared to the other three basins, KRB has received the fewest interventions from government and donors to date. The KRB is topographically and climatically very variable and is highly vulnerable to extreme climate events such as GLOFs, floods, mudflows and landslides^{60,61}. It is also the smallest of Tajikistan’s four basins and is fully encompassed within Tajikistan (i.e. is not

⁵⁵ Poverty-Environment Initiative in Tajikistan. 2012. The Economics of Land Degradation for the Agricultural Sector in Tajikistan – A Scoping Study. Final Report, United Nations Development Programme (UNDP) and United Nations Environment Programme (UN Environment).

⁵⁶ Fergana Valley Water Resources Management (WRM). 2018. Kofirnighan River Basin Plan and Management Plan (KRBMP) Draft. Unpublished, Dushanbe, Tajikistan.

⁵⁷ Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme). 2015. Resolution of the Government of the Republic of Tajikistan. Unofficial translation.

⁵⁸ Water Reform Programme 2015.

⁵⁹ Fergana Valley WRM 2018 KRBMP Unpublished.

⁶⁰ State Agency for Hydrometeorology (Hydromet). 2018. Assessment of Kofirnighan River Basin (KRB), natural disasters and needs. Unofficial document.

⁶¹ see sub-section on KRB below

transboundary). A Kofirnighan River Basin Management Plan (KRBMP) has been developed for the basin. Although this plan includes the measures for the improvement of water management, it does not integrate land and natural resources into the water management. Neither does it consider probabilistic impacts of climate change on the river basin hydrology and a broader catchment.

Kofirnighan River Basin

The proposed project focuses its activities within the Kofirnighan River Basin (KRB) as, of the four basins within Tajikistan: i) the KRB has received limited international support for the implementation of integrated catchment management; ii) a large number of communities within the basin are highly vulnerable to a wide range of climate risks; iii) the basin's variable topographic and climatic conditions are highly representative of the conditions in Tajikistan; and iv) there are no transboundary disputes along the river⁶². A detailed justification for the selection of the KRB for project activity implementation has been included as Annex 3.

Situated in the south-western and western parts of the country, the KRB occupies a total area of ~11,600 km², with the mountain catchment making up 8,070 km² of this (equating to ~70% of the total basin area)⁶³. The basin is divided into two regions, namely the north and the central/south regions⁶⁴. The Gissar Valley encompasses the north region, which includes the city of Dushanbe, while the Kofirnighan and Beshkent valley depressions make up the south region. The Gissar Ridge forms the highland areas, extending for 250 km to elevations of ~4,500 masl and is home to 343 glaciers, covering a total area of 115 km².⁶⁵ The river of Kofirnighan, at ~387 km long, is one of the major contributing inflows of Tajikistan's largest river, the Amu Darya River⁶⁶. It flows through different mountain ranges and zones within the basin including high mountains, intermediate foothills and low and flat zones. The basin's groundwater reserves are economically important and are used to irrigate crops (~98,000 ha) and pastures (~56,000 ha). Most of the irrigated land is in the arid southern sub-basin, while cultivated land in the northern sub-basin is largely rain-fed.

The mountain ranges and glaciers have a major influence on the air temperatures within the KRB. Temperature and precipitation gradients exist along the zones (mountainous, foothill, low), with temperatures increasing as one moves from the mountainous to the low-lying zones, and precipitation decreasing in this direction. In the mountainous areas of KRB, average temperatures range from 18°C in the summer months (hottest summer temperatures being ~35°C) to -8°C in the winter months (with cold air masses sometimes resulting in temperatures as low as -30°C). Intensely hot summer temperatures are typical for the south of KRB, which experiences mild winters compared with the north. Average temperatures in the southern areas of KRB range from ~31°C in the summer months (hottest summer temperatures being ~48°C) to ~2°C in winter (with temperatures dropping to as low as -28°C)⁶⁷.

In terms of political divisions, the KRB is made up of 10 administrative districts, 4 cities including Dushanbe, 10 villages and 77 *jamoats* (rural self-governance bodies). This division in the population is recorded in [Table 1](#). As of January 2017, the total KRB population was 2.8 million people, with ~62% living in rural areas and ~38% in towns. Over the past 13 years, the KRB population has increased by 712,000 people (representing a ~34% total increase and an annual growth rate of 2.5%).

⁶² reducing the project partners and stakeholders to within the country

⁶³ Tahirov IG & Kupayi GD. 1994. Water resources of Tajikistan of the Republic of Tajikistan. Dushanbe 1:181.

⁶⁴ Fergana Valley WRM 2018 KRBMP Unpublished.

⁶⁵ Ibid.

⁶⁶ Tahirov & Kupayi 1994 Water resources of Tajikistan.

⁶⁷ Fergana Valley WRM 2018 KRBMP Unpublished.

Table 1. Kofirnighan River Basin population numbers according to cities and villages⁶⁸.

No.	Districts and cities	Population ⁶⁹			Population density ⁷⁰	No. of cities	No. of urban-type settlements	No. of <i>jamoats</i>
		Total	City (%)	Village (%)				
1	Dushanbe	816,200	100	0	8162	1	0	0
2	Varzob	76,900	3	97	45,2	0	1	6
3	Vakhdad	324,000	17	83	87,6	1	1	10
4	Gissar	287,400	14	86	287,4	1	1	11
5	Faizobod	96,900	10	90	107,7	0	1	7
6	Tursunzade	280,000	19	81	233,3	1	0	9
7	Rudaki	476,500	11	89	264,7	0	3	13
8	Nosiri Khusrav	35,900	0	36	44,9	0	0	3
9	Kabodiyon	173,800	7	93	96,6	0	1	7
10	Shaartuz	120,500	14	87	80,3	0	1	5
Total		2,802,500	38	62	180,8	4	10	77

The State Agency for Hydrometeorology (Hydromet) has identified KRB as a basin particularly vulnerable to extreme climate events^{71,72}. Such extreme events have affected 163 communities within the basin. These KRB communities are illustrated in [Figure 3](#), including the main river and tributaries.

A methodology which ranks rural areas in terms of their vulnerability to climate impacts has been used to identify the specific districts within the KRB that are the most vulnerable to climate change^{73,74}. Ranking of areas used the following criteria⁷⁵:

- exposure to extreme climate events caused by climate change including temperature, precipitation, floods and drought;
- sensitivity to climate change on sectors/elements including productivity, poverty, access to land resources, dependence on agricultural production and diseases; and
- adaptation potential which included access to health care, education, drinking and irrigated water, cattle density and internal and external migration.

Taking the above criteria into account, the following districts were deemed the most vulnerable districts within KRB: i) Vakhdad, Faizobod and Varzob in the north; and ii) Nosiri Khusrav, Kabodiyon and Shaartuz in the south.⁷⁶ These six districts are described in greater detail in the sub-sections below⁷⁷.

⁶⁸ Agency for Statistics. 2017. Regions of the Republic of Tajikistan. Under the President of the Republic of Tajikistan.

⁶⁹ Population census as at 1 January 2017.

⁷⁰ Population density is measured per km².

⁷¹ Hydromet 2018 Assessment of KRB, Unofficial document.

⁷² Further information concerning the KRB's vulnerability to extreme climate events is presented under 'Climate change context'.

⁷³ Asian Development Bank (ADB). May 2016. Tajikistan: Building Capacity for Climate Resilience – Mid-term Report (MTR). Technical Assistance Consultant's Report. Prepared by ABT Associates for the ADB and GoT. Project No: 45436-001; TA 8090.

⁷⁴ This methodology was developed under ADB project, titled 'Building capacity for climate resilience in Tajikistan', which contributed to the development of the National Climate Change Adaptation Strategy Tajikistan (NCCAS).

⁷⁵ ADB 2016 Tajikistan: Building Capacity for Climate Resilience – MTR.

⁷⁶ Fergana Valley WRM 2018 KRBMP Unpublished.

⁷⁷ Further information concerning districts' vulnerability to extreme climate events is presented under district descriptions.

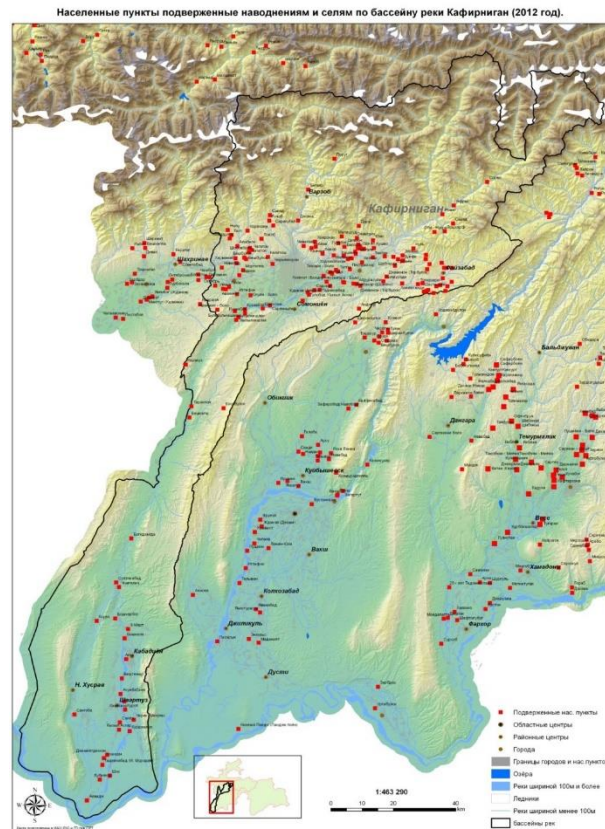


Figure 4. Map of Kofirnighan River Basin (outlined in black) indicating the most vulnerable communities to extreme climate events. Communities are indicated by a red dot.

Vahdat District

The district of Vahdat is situated ~10 km east of Dushanbe and, at 3,700 km², is one of the largest districts in Tajikistan. Altitude, which ranges from ~1,500 masl to more than 3,000 masl, is a major factor influencing the Vahdat climate. Warm summers and cool winters are experienced up to 1,500 masl, with average temperatures between 25–35°C in summer (July) and -5–0°C in winter (January). Between 1,500–2,500 masl, a moderate climate with a cool summer and a cold winter is experienced. At a height of more than 3,000 masl, cold winters are the norm, coupled with an average annual precipitation of 700–900 mm. The district has five rivers with the largest being the Kofirnighan River, at a length of 70 km⁷⁸.

As of 2017, the total population of Vahdat was 324,000 people, with ~83% of the population living in rural areas⁷⁹. Of the total area of the district, agricultural land comprises ~142,000 ha (~38%), of which ~87% is pasture, ~9% is arable land and ~3% is cultivated with perennial trees. Approximately 58% of Vahdat’s agricultural production is derived from the production of crops, whilst the remaining ~42% is derived from livestock products. More than 10% of the population works as migrant labourers outside the district.

Varzob District

Varzob District is situated north of Dushanbe and covers an area of ~1,700 km². The northern extent of Varzob is comprised of the Gissar Mountain Range with the Varzob River running through the entire district from north to south. The Gissar range results in a variable climate, with cold winters. In winter months, the temperature drops to -31°C, with snow thickness reaching up to 1.5 m. Annual average annual precipitation for the district is 960–990

⁷⁸ Fergana Valley WRM 2018 KRBMP Unpublished.

⁷⁹ Ibid.

mm. Snow deposits and glaciers make up ~52 km² of the total land area in Varzob. These large snow- and glacier-covered areas within the district render most of the territory prone to natural disasters⁸⁰.

An array of natural disasters affect the district, including prolonged rainfall events, mudflows, landslides, rockfalls and avalanches. Approximately 31% of existing settlements within the district (22 out of 70) are prone to natural disasters, with ~4% of households located in hazardous areas⁸¹.

The total population of the district is ~769,000 people, with ~97% of the population living in rural areas. Most of the land in the district comprises mountains (96%), with agricultural lands making up only ~2% (163,133 ha), pastures ~0.8% (67,811 ha) and non-agricultural lands ~1.1% (91,794 ha)⁸². Of the total agricultural land, ~0.6% (260 ha) is irrigated. Cultivated crop species include perennial fruit-bearing trees (309 ha), vineyards (383 ha), mulberry trees (51 ha) and other perennial trees⁸³ (19 ha). Approximately 56% of Varzob's agricultural production is derived from livestock, with ~44% derived from crops. Of the district's total working population, more than 4% works as migrant labourers outside of the district⁸⁴.

Faizobod District

The district of Faizobod covers an area of ~900 km² and is situated at an average altitude of ~1,200 masl. Faizobod climate is medium continental, with average temperatures ranging from ~14-28°C in summer (July) and 3°C in winter (January). Average annual precipitation in the mountainous areas is 1,136 mm and is 767 mm in the valleys⁸⁵.

As of 2017, the total population of the district was 96,900 people. Approximately 90% of the district's population live in rural areas, with the remaining 10% living in urban settlements. Land use within the district is divided between pastures (~58%), arable land (~9%), forests and shrubs (~8%) and perennial trees (~5%). The Faizobod agricultural sector is comprised of livestock production (~57%) and crop production (~43%). More than 13% of the population works as labourers in other districts⁸⁶.

The main natural disasters occurring within Faizobod are floods, mudflows and landslides. All these disasters are primarily caused by the flooding of the Surkhudara and Elok Rivers. Negative impacts from these disasters threaten 26 villages, which make up ~7% of the district's population. This equates to ~6,559 people or 1,059 households⁸⁷.

Nosiri Khusrav District

The Nosiri Khusrav district is ~800 km² and occurs at altitudes ranging from 380–400 masl. The climate in the district is dry and subtropical, with hot and dry summers and mild winters. The average temperature in summer (June–August) ranges from 40–55°C and is 10°C in winter (January). Total annual precipitation during winter months reaches 80 mm, with even less precipitation during spring and autumn months (up to 25–30 mm).

In 2017⁸⁸, the total population of Nosiri Khusrav was 35,900 people, with the entire population living in rural areas. As of 2014, ~84% (67,423 ha) of the district's total area was comprised of agricultural land, with ~16% (11,022 ha) of this land being irrigated. Of the total working population, more than 12% work outside of the district as labour migrants.

Shaartuz District

The district of Shaartuz covers ~1,500 km², with a flat topography relative to other KRB districts. Only ~9% of the total district area is occupied by low mountain ranges. These ranges include: i) Bobotog (up to 2,100 masl); ii) Tuyuntog (up to 1,314 masl); and iii) Arikotog (just over 800 masl). The climate of the region is dry and subtropical,

⁸⁰ Fergana Valley WRM 2018 KRBMP Unpublished.

⁸¹ Ibid.

⁸² Fergana Valley WRM 2018 KRBMP Unpublished.

⁸³ e.g. walnut orchards

⁸⁴ Fergana Valley WRM 2018 KRBMP Unpublished.

⁸⁵ Fergana Valley WRM 2018 KRBMP Unpublished.

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ as of January 2017

with warm-hot, dry summers and mild winters. The average annual temperature is ~32°C, with an average annual precipitation of 143 mm. In the low mountain areas, this annual precipitation average reaches 200 mm. The warm summer period lasts for ~190 days with humidity during these months reaching ~23%.

As of 2017, the total population of the district was 120,500 people. Approximately 87% of the population live in rural areas, with the remaining ~13% being situated in urban areas. The density of the population is 80 people per km². Of Shaartuz's total working population, more than 7% work as migrant labourers beyond district borders.

Kabodiyon District

The district of Kabodiyon covers 1,900 km². It is located in the south of the Gissar and Alai Highlands, at an average altitude of ~788 masl. Kabodiyon is surrounded by the mountain ranges of Bobotog, Oktoi, Karotog and Chilontoy and consequently has a dry and continental climate. In winter (January), air temperatures range from -2–2°C, while summer (July) temperatures range from ~24–41°C.

The total population of the Kabodiyon District is 173,800 people. Approximately 93% of the population lives in rural areas, with a density of ~97 people per km². More than 11% of Kabodiyon's working population works as migrant labourers outside of the district.

Ecosystem goods and services

Tajikistan's natural systems provide numerous ecosystem goods and services. These critical ecosystem services can be broadly categorised into:

- provisioning services – products obtained directly from ecosystems;
- regulating services – benefits obtained through the regulation of ecosystems;
- cultural services – non-material benefits obtained through ecosystems; and
- supporting services – services necessary to produce all other ecosystem services.

Ecosystem services that are currently under threat from climate change and the effects thereof in Tajikistan are outlined in Table 2 according to the above four categories.

Table 2. A description of ecosystems goods and services in Tajikistan threatened by climate-induced and anthropogenic factors.

Service	Description of threat to service
Provisioning services	
Fresh water	Catchments – particularly in the Pamir Mountains in western Tajikistan – provide fresh water not only to the country, but to the greater Central Asian region. The impacts of climate change on these areas significantly affect areas downstream. Predicted climate change impacts on river discharge are varied, with models under 'hot and dry' scenarios showing a reduction in river discharge and 'warm and humid' scenarios showing the converse. Additionally, climate-induced rising air temperatures are causing increased melting of glaciers, snow cover and permafrost soils ⁸⁹ ; all of which affect catchment hydrology through increased run-off and large-scale gully and sheet erosion ⁹⁰ .
Food	Tajikistan's agricultural sector is an integral component of the country's economy, contributing more than 20% of the GDP ^{91,92} . Approximately 70% of Tajikistan's population live in rural areas and is dependent on agriculture. Crop and livestock productivity, especially in dry-land farming, are vulnerable to climate variability, particularly drought and extreme temperatures ⁹³ , as well as soil erosion, declining soil fertility and unsustainable use of pastures ⁹⁴ .

⁸⁹ Third National Communication 2014.

⁹⁰ NAPCC 2003.

⁹¹ Third National Communication 2014.

⁹² Curtin M. 2001. Environmental profile of Tajikistan. Asian Development Bank (ADB).

⁹³ Third National Communication 2014.

⁹⁴ Ibid.

Service	Description of threat to service
Raw materials	Forests are a critical resource to communities ⁹⁵ , providing food and wood, as well as fodder and grazing to support livelihoods ⁹⁶ . Permanent pastures currently cover ~3.6 million ha ^{97,98} of land in Tajikistan. Degradation is widespread in these areas and is primarily characterised by an increase in unpalatable grasses as well as a 15–20% decrease in productivity ⁹⁹ . Sheep and goats are generally shepherded to high-altitude, summer pastures, returning to low-altitude, village pastures for the winter period ¹⁰⁰ . Cattle are often grazed near villages resulting in severe degradation of rangelands through overgrazing ¹⁰¹ . Climate change impacts – predominantly droughts and extreme temperatures – have been greatest on dry-land farms and pasture lands, resulting in declining crop productivity and livestock carrying-capacity, respectively ¹⁰² .
Energy	Hydropower currently contributes 98% to Tajikistan’s energy supply, with coal-, solar- and biomass-derived power providing the balance; however, this supply does not meet the country’s annual requirements. Tajikistan has considerable hydropower potential ^{103,104} and development of more hydropower plants is a national priority ¹⁰⁵ . Large-scale soil erosion and intense climate-induced hydrometeorological events damage hydropower infrastructure, for example through siltation of dams and damage to turbines ¹⁰⁶ . The ability to generate hydropower is negatively impacted by climate-induced fluctuations in river discharge.
Genetic plant resources	Tajikistan is an important source of agro-biodiversity and is one of the main countries of origin for cultivated plants worldwide ¹⁰⁷ for example the mountainous regions of the country host wild plantations of many different species of fruit trees ^{108,109} . Numerous anthropogenic ¹¹⁰ and natural factors pose a risk to this indigenous plant genetic material ¹¹¹ . Some of the natural factors exacerbated by climate change include drought, hot and dry winds, extreme frosts, plant diseases, plant pests and soil salination.
Regulating services	
Water purification, water regulation and erosion control	Excessive climate change-induced run-off of water from mountain slopes is causing large-scale soil erosion, including sheet and gully erosion, across the country. This erosion poses considerable risk to Tajikistan’s food, water and energy security ¹¹² . Such large-scale soil erosion is affecting water infiltration, percolation and retention and is consequently hampering water purification and regulation services ¹¹³ . Inappropriate land-use – such as deforestation, over-grazing and cultivation of steep slopes – further reduces soil function ¹¹⁴ .
Climate regulation; carbon sequestration	Although pastures in Tajikistan contribute less plant biomass per unit area than forests, pastures cover ~32% of the total land area ¹¹⁵ and consequently fulfil an important function in climate regulation and absorption of atmospheric carbon. The natural vegetation of Tajikistan produces ~80 million tonnes of phytomass annually, ~39% of it occurring above-ground and 61% underground ¹¹⁶ . Pastures are particularly vulnerable to climate change-induced degradation that causes reduced vegetation cover, negatively affecting livestock productivity ¹¹⁷ .

⁹⁵ Fauna and Flora International 2018 “Tajikistan: Wild riches”.

⁹⁶ A large part of the remaining forest area is given for long-term use as pasture.

⁹⁷ equivalent to almost 29% of its total land area

⁹⁸ The Food and Agriculture Organisation of the United Nations (FAO). 2008. Tajikistan: Reducing the Impact of Price Surge and Agriculture Rehabilitation Programme. Appraisal Document.

⁹⁹ Third National Communication 2014.

¹⁰⁰ FAO 2008 Tajikistan: Reducing the Impact.

¹⁰¹ Third National Communication 2014.

¹⁰² Ibid.

¹⁰³ approximately 3.6 mln kWh/1 km/year

¹⁰⁴ Third National Communication 2014.

¹⁰⁵ Ibid.

¹⁰⁶ Third National Communication 2014.

¹⁰⁷ UNDP-GEF. 2009. Project title: Sustaining agricultural biodiversity in the face of climate change in Tajikistan: vulnerability and adaptation. [accessed 03.07.2018].

¹⁰⁸ In many cases, the distinction between cultivated and wild plants is unclear.

¹⁰⁹ FAO 2008 Country Report.

¹¹⁰ including deforestation, overgrazing, overharvesting for fuelwood and medicinal purposes, and grubbing of old orchard

¹¹¹ FAO 2008 Country Report.

¹¹² Ibid.

¹¹³ NAPCC 2003.

¹¹⁴ Third National Communication 2014.

¹¹⁵ NAPCC 2003.

¹¹⁶ FAO 2008 Country Report.

¹¹⁷ Third National Communication 2014.

Service	Description of threat to service
Disease regulation	Climatic variability increases the vulnerability of Tajikistan's population to infections and diseases including malaria and typhoid ^{118,119} . The agricultural sector in the country is also increasingly at risk to plant pathogens and pests. Crop breeding programmes in the country are currently aiming to produce crop varieties with enhanced resistance ¹²⁰ to mitigate these negative effects.
Cultural services	
Scenic and cultural resources	Tajikistan's rich culture derives from natural, heritage and spiritual resources. The country has two UNESCO world heritage sites: i) the Tajik National Park in the Pamir Mountains; and ii) the Proto-urban Site of Sarazm, an archaeological site. ¹²¹ The ancient Silk Road network of the Central Asian region passes through Tajikistan ^{122,123} , and is a major tourist attraction along with the numerous towns, castles and ruins along the route ¹²⁴ . The country's scenic and cultural services are threatened by climate change impacts (such as GLOFs, floods, mudflows, landslides and drought) that cause the damage or degradation of natural, heritage and spiritual resources.
Recreation	Tajikistan's mountainous areas ¹²⁵ host a hiking industry, and a growing tourism sector has supported the establishment of health resorts around the country's natural springs. Tourism has recently become an important sub-sector in the country's economy ¹²⁶ . In 2016, tourism contributed 8.2% to GDP (equating to US\$0.6 billion). The contribution to employment of this sub-sector, including jobs indirectly supported by it, was ~21% of total employment (490,500 jobs) ¹²⁷ . The dependence of nature-based tourism on natural resources renders recreational services particularly vulnerable to the impacts of climate change.
Science and education	Tajikistan's natural protected areas are increasingly being used by schools to promote science and ecological research. The GoT recognises that scientific institutions, in partnership with the institutes of higher education, are important for developing research capacities on climate change and environmental science ¹²⁸ . Public environmental organisations are also playing an important role in environmental protection and education in Tajikistan. There are ~40 registered environmental NGOs in Tajikistan, primarily addressing biodiversity conservation in and around protected areas. Their principal activities include ecological awareness, education, information generation, information dissemination, and research related to biodiversity and protected area development ¹²⁹ . Climate change impacts — resulting in the degradation of landscapes (within which research sites occur) and the physical damage to infrastructure (e.g. community education centres) and in-field research equipment — negatively impact the country's scientific and educational services.
Spiritual and religious	Approximately 90% of Tajikistan's population is Muslim ^{130,131} , with the balance comprising several other religions ¹³² . Despite having been predominantly Muslim since the 10 th century, in some communities, traditional, non-Muslim, cultural practices are still held, particularly among the elderly. Ancestors of Tajik people worshipped nature and natural phenomena, and many of these methods are still being practised. In some mountainous regions, animals such as eagles and hawks are considered animal totems, and the elements of earth, water and fire hold particular cultural significance in day-to-day life and ceremonies. For example, fire is used in wedding rituals (fires are burnt near to the groom's house to light the road; the bride jumps over a large fire before entering her husband's house) and rituals for pregnancy and childbirth (a fire is kept burning during pregnancy, childbirth and for the 40 days of the child's life) ¹³³ . Since some aspects of the spiritual/religious

¹¹⁸ The transmission of typhoid is increasing, which has been coupled with a reduction in the quality of drinking water especially during intense rainfall events.

¹¹⁹ Third National Communication 2014.

¹²⁰ FAO 2008 Country Report.

¹²¹ United Nations Educational, Scientific and Cultural Organisation (UNESCO). 2018. World Heritage Convention: Tajikistan. Available at: <https://whc.unesco.org/en/statesparties/tj> [accessed 03.07.2018].

¹²² including the areas of Penjikent, Khujand, Istarafshan and Gissar

¹²³ The road splits west of the Pamirs, one branch passing to the north of the Pamirs and the other to the south. See further: UNESCO 2018 World Heritage Convention.

¹²⁴ Third National Communication 2014.

¹²⁵ Third National Communication 2014.

¹²⁶ Ibid.

¹²⁷ World Travel and Tourism Council (WTTTC). 2017. Travel and Tourism: Economic Impact 2017 Tajikistan.

¹²⁸ Third National Communication 2014.

¹²⁹ FAO. 2008. Tajikistan: NFP update.

¹³⁰ with Sunni Muslim comprising ~85% and Shia Muslim comprising ~5%

¹³¹ Central Intelligence Agency (CIA). 2018. The World Factbook: Central Asia: Tajikistan. Available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html> [accessed 03.07.2018].

¹³² There are 85 non-Muslim groups registered with Tajikistan's Department of Religious Affairs at the Ministry of Culture.

¹³³ Advantour. 2018. "Tajikistan Rituals". Available at: <https://www.advantour.com/tajikistan/traditions/wedding-rituals.htm> [accessed 23.07.2018].

Service	Description of threat to service
	services are underpinned by nature, although difficult to quantify, the climate change-induced degradation of natural resources would result in the gradual erosion of these services.

CLIMATE CHANGE CONTEXT

Observed climate change

Tajikistan has experienced a considerable warming of its climate since 1950¹³⁴ (Figure 5). The most recent warming trend from 1976 to 2010 averaged $\sim 0.15^{\circ}\text{C}$ per decade in winter and spring, $\sim 0.3^{\circ}\text{C}$ per decade in summer and $\sim 0.2^{\circ}\text{C}$ per decade in autumn. From 2001 to 2010, the country experienced the warmest decade in its history (12)¹³⁵. Average temperatures for the decade were: i) 1°C above the long-term average in the foothills (0–1,000 m); ii) 0.8°C above the long-term average in the mid-hills (1,000–2,500 m); and iii) 0.2°C above the long-term average in the highlands (above 2,500 m).¹³⁶

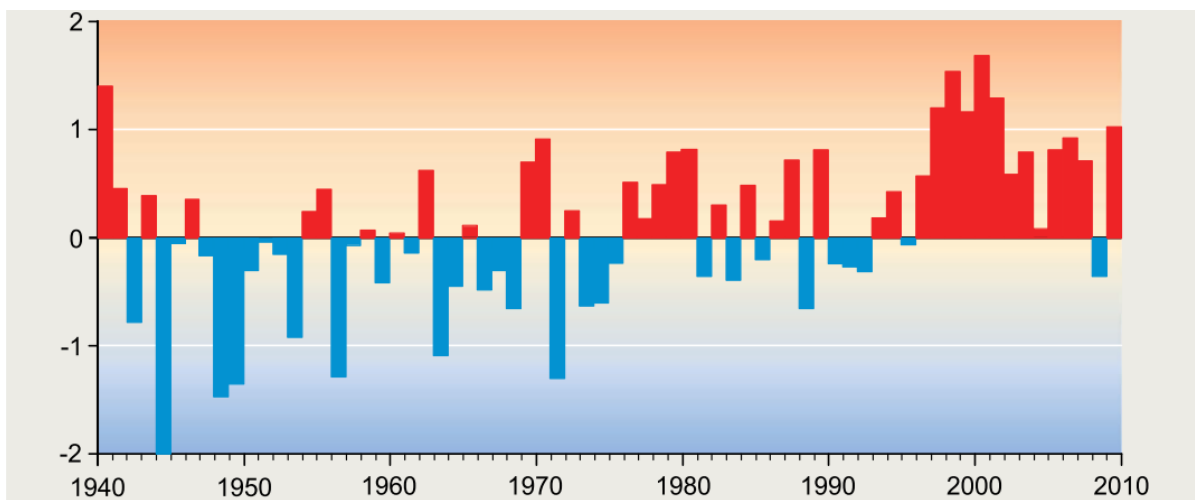


Figure 5. Illustration of the annual temperature ($^{\circ}\text{C}$) departure from the average long-term norm for the period 1961–1990 in Tajikistan¹³⁷.

The temperature changes across Tajikistan have been accompanied by increasingly erratic rainfall (Figure 6) which has resulted in both: i) an increase in rainfall intensity; and ii) longer dry spells.¹³⁸ In recent years, the amount of precipitation¹³⁹ received across the country has been above the long-term annual average. For example, from 1940–2010, average annual precipitation increased by $\sim 7\%$. This trend has not been uniformly distributed across the country, with some regions experiencing increases in annual rainfall and others experiencing decreases. Decreases in annual precipitation have been experienced in the following regions:

- mid-hills and highlands of Central Tajikistan;
- valleys of southwestern and northern Tajikistan;
- foothills of Turkestan range;
- highland areas of Eastern Pamir; and

¹³⁴ Third National Communication 2014.

¹³⁵ State Agency for Hydrometeorology. 2018. Under the Committee for Environmental Protection under the Government of the Republic of Tajikistan Available at: http://www.ijozat.tj/index.php?option=com_content&view=section&id=30&lang=en [accessed 03.07.2018].

¹³⁶ Third National Communication 2014.

¹³⁷ State Agency for Hydrometeorology 2018.

¹³⁸ Ibid.

¹³⁹ 'Precipitation' refers to the combined amount of rainfall and snowmelt.

- foothills, mid-hills and highlands of the Khatlon region.

Over the same period, annual precipitation increased in the Rasht and Darvaz regions by 14–18%, the Western Pamir region by 12–17% and in the Fedchenko Glacier by 36%¹⁴⁰.

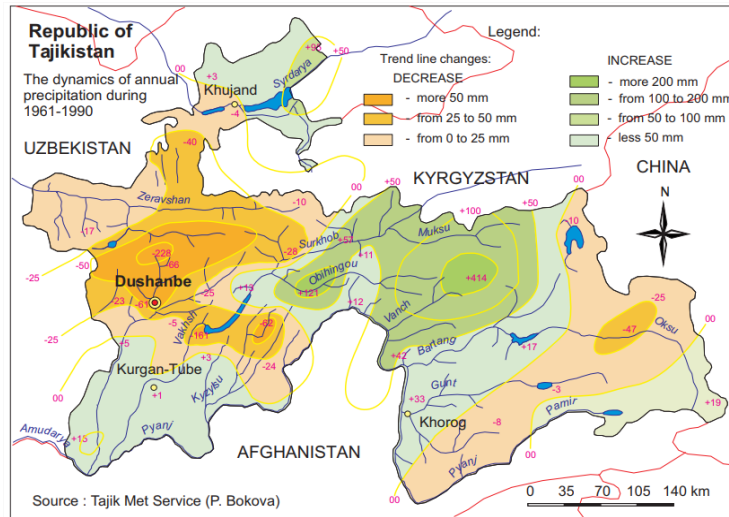


Figure 6. Changes of mean annual precipitation observed across Tajikistan during 1961–1990¹⁴¹.

The number of days with precipitation (hereafter referred to as ‘rain days’) has decreased across the country since 1961¹⁴². By contrast, the number of days in which heavy precipitation events have occurred have increased¹⁴³. The decrease in rain days coupled with the increase in heavy precipitation events equates to an increase in rainfall intensity in Tajikistan¹⁴⁴.

Fewer rain days and increased temperatures have resulted in a greater incidence of intense dry spells across Tajikistan¹⁴⁵. In the major crop-growing regions, droughts that impact yields by at least 20% have been increasing in frequency over the past decade. Currently, these droughts occur once in every¹⁴⁶:

- 3 years in south and south-east Tajikistan, Danghara, Kulyab, Bokhtar, Kabodiyon and Shaartuz regions;
- 4 years in the Eastern Tajikistan region; and
- 5 years in the North-Tajikistan region.

Severe droughts – those that reduce average crop yields by at least 50% – have been observed once in every¹⁴⁷:

- 4–5 years in the Bokhtar, Kabodiyon, Vakhsh and Shaartuz regions;
- 6–8 years in the Danghara, Kulyab, Temurmaliq, Baljuvon, Vose and Balkhi regions;
- 9–11 years in the Devashthi, Spitamen and Istaravshan regions; and
- 12–15 years in the Kanibadam Asht and Isfara regions.

¹⁴⁰ NAPCC 2003.

¹⁴¹ Third National Communication 2014.

¹⁴² Ibid.

¹⁴³ Kayumov 2016 Glaciers resources of Tajikistan.

¹⁴⁴ Third National Communication 2014.

¹⁴⁵ World Food Programme (WFP). 2017. Climate Risks and Food Security in Tajikistan: A Review of Evidence and Priorities for Adaptation Strategies.

¹⁴⁶ The Food and Agriculture Organisation of the United Nations (FAO). 2017. Drought Characteristics and Management in Central Asia and Turkey. FAO Water Report 44: Policy Support and Governance.

¹⁴⁷ FAO 2017 Drought Characteristics and Management.

Climate risks, impacts and vulnerabilities

As noted previously in this document, Tajikistan is the most vulnerable country to climate change in Central Asia¹⁴⁸. This vulnerability is attributed to the country's: i) weak social structures; ii) low adaptive capacity; iii) underdeveloped infrastructure; iv) low-income insecurity; v) poor service provision; vi) strong dependence on agriculture; and vii) institutional constraints. Losses from natural hazards currently amount to ~20% of the country's GDP¹⁴⁹ and climate change impacts are predicted to increase the frequency and magnitude of such losses. In the future, loss amounts are expected to rise from ~US\$50 million in 2014 to ~US\$132 million by 2030¹⁵⁰ (Table 3).

Table 3. Total countrywide damages caused by climate change and extreme climate events¹⁵¹.

Risks and hazards	Total damage countrywide			
	2014 (US\$)	2030 (US\$)	Increase (US\$/year)	Increase (%)
Rise in temperature	22,230,000	42,210,000	19,980,000	90
Drought	22,230,000	42,210,000	19,980,000	90
Pasture degradation	4,131,000	41,310,000	37,179,000	900
Mudflows	432,000	2,331,000	1,899,000	440
Intense precipitation	342,000	531,000	189,000	55
Water logging	324,000	504,000	180,000	56
High water and flooding	144,000	2,313,000	2,169,000	1,506
Gusty winds	144,000	144,000	0	0
Decrease in air temperature/freezing	126,000	126,000	0	0
Duration of snow cover	90,000	90,000	0	0
Landslides	63,000	540,000	477,000	757
Agricultural insects and pests	63,000	630,000	567,000	900
Dust storms	45,000	45,000	0	0
Avalanches	27,000	270,000	243,000	900

Negative effects of climate change on the Tajik population include: i) glacial and permafrost melt; ii) increased rainfall intensity; and iii) longer and more frequent dry spells.¹⁵² Together, these effects have increased the rate of topsoil erosion, threatening the food, water and energy security of the country¹⁵³. Approximately 33% of all agricultural losses in the country are currently attributable to climate change and variability¹⁵⁴. Furthermore, it has been projected that crop yields in Tajikistan will decrease by an additional 5–30% by 2050, with the potential for severe negative impacts on the country's economy¹⁵⁵.

Glacial melt poses a particularly large risk to the population of Tajikistan, currently averaging ~2 km³ per year and leading to meltwater flows which often result in large-scale sheet and gully erosion¹⁵⁶. Further negative impacts of meltwater flows include high frequency, low–medium impact hazards (such as extreme river flows and flooding,

¹⁴⁸ WFP 2017 Climate Risks and Food Security.

¹⁴⁹ Ibid.

¹⁵⁰ National Climate Change Adaptation Strategy Tajikistan: Building Capacity for Climate Resilience (NCCAS). 2016. Asian Development Bank (ADB) and the Government of Tajikistan (GoT). Draft prepared by Abt Association with the GoT Committee of Environmental Protection (CEP).

¹⁵¹ United Nations Development Programme (UNDP). 2014. Central Asian Multi-Country Programme on Climate Risk Management (CA-CRM). Regional Project Document. Atlas Award ID 59476.

¹⁵² UNDP 2014 CA-CRM.

¹⁵³ Third National Communication 2014.

¹⁵⁴ National Human Development Report (NHDR). 2012. Tajikistan: Poverty in the Context of Climate Change. United Nations Development Programme (UNDP), Dushanbe.

¹⁵⁵ Third National Communication 2014.

¹⁵⁶ Jacob P. 9 October 2016. "Global warming imperils Tajikistan's landscape". Aljazeera. Available at: <https://www.aljazeera.com/news/2016/10/global-warming-imperils-tajikistan-landscape-161009175837236.html> [accessed 03.07.2018].

mudflows and landslides), and low frequency, high impact hazards (such as GLOFs)¹⁵⁷. These low frequency, high impact hazards are particularly problematic because they are likely to trigger multiple other hazards, such as flash floods and landslides, as well as aggravate the scale and magnitude of such hazards. The impacts of flooding, mudflows, landslides and other hazards have resulted in considerable economic damages and losses of life across Tajikistan. Such damages and losses of life are particularly marked in the KRB (Table 4).

Table 4. Economic damages as a result of climate hazards occurring within the Kofirnighan River Basin, including number of events occurring from 1998–2014 and losses in life¹⁵⁸.

Climate hazard	Number of events (occurring from 1998–2014)	Economic damages (US\$)	Loss of life (no. of people)
Flooding	31	5,577,682	0
Mudflows	98	191,898,148	38
Avalanches	8	326,808	8
Landslides and rockfalls	39	138,115	3
Drought	17	3,359,363	0
Earthquakes	83	1,37,017	0
Total	276	202,437,132	49

The negative impacts described above have been exacerbated by increasingly erratic rainfall. Floods and droughts caused by such erratic rainfall directly impact water quality and quantity across the country, and have also contributed to topsoil erosion¹⁵⁹. The increasing rate of topsoil erosion is a threat to Tajikistan's food, water and energy security, which impacts the livelihoods, health and wellbeing of the population with regards to: i) food production, whereby decreasing soil fertility is reducing crop and livestock productivity; ii) water supplies, whereby the siltation of rivers is further contributing to declining water quality; and iii) energy security, whereby damage from silt to turbines in hydropower plants and reservoirs is reducing the efficiency of hydropower generation.

The KRB has been identified as a region within Tajikistan that is particularly vulnerable to the impacts of extreme climate events, with almost 200 communities living in the basin experiencing severe negative impacts^{160,161}. All four of Tajikistan's agro-ecological zones are represented within the KRB as a result of the considerable altitudinal variation from south to north¹⁶². This altitudinal variation also results in the KRB being vulnerable to a wide range of climatic hazards, including both sudden-onset and slow-onset climate events, such as GLOFs and droughts, respectively. Communities in the KRB are frequently exposed to such extreme climate events. Flooding and landslides pose the greatest threats to these communities, with flooding seasons differing between upper, middle and lower reaches of the KRB. Upstream reaches experience floods from April to June, the middle reaches from March to May, and the downstream reaches from February to May. Because of the longer season in the downstream areas, the risk of flooding and landslides is much greater for these communities¹⁶³.

Many of the households located in the six most vulnerable districts of the BKRB are located in hazardous areas and experience a number of climate-related threats and disaster events including: i) floods; ii) mudflows; iii) landslides; iv) rockfalls; and v) avalanches¹⁶⁴. In addition to increased exposure to climate-related threats, these are all rural communities with limited adaptive capacity because of their dependence on agriculture for livelihoods, and limited opportunities for alternative income. About one-third of the agricultural losses in Tajikistan are currently attributable to climate change and variability¹⁶⁵, meaning that communities in the KRB who rely on agriculture for income are extremely vulnerable to the current and future impacts of climate change.

¹⁵⁷ WFP 2017 Climate Risks and Food Security.

¹⁵⁸ Committee for Emergency Services (CoES). 2018. Statistical damages data for 1998–2014. Provided by the UNDP DRMP.

¹⁵⁹ Ibid.

¹⁶⁰ Hydromet 2018 Assessment of KRB, Unofficial document.

¹⁶¹ Further information concerning the KRB's vulnerability to extreme climate events is presented under 'Climate change context'.

¹⁶² Tajikistan's agro-ecological zone are classified according to elevation, with the lower zones (1 and 2) primarily being used to grow irrigated crops such as cotton and sub-tropical fruit. Zones of higher elevation (3 and 4) are primarily rain-fed agriculture and used primarily for pasture land and for growing wheat, barley and Lucerne.

¹⁶³ Hydromet 2018 Assessment of Kofirnighan River Basin.

¹⁶⁴ Further information concerning district-specific vulnerability to extreme climate events is presented under district descriptions.

¹⁶⁵ NHDR 2012 Tajikistan: Poverty in the Context of Climate Change.

The impacts of climate change are likely to be different in the northern sub-basin of the KRB to those in the southern sub-basin. Rural communities in the Vakhdat, Faizobod and Varzob districts are expected to become increasingly exposed to hydrometeorological hazards such as increased flooding, landslides and GLOFs. In particular, the steep terrain in these areas increase the likelihood of sudden onset multi-hazard risks, such as landslides occurring directly after a GLOF or similar flooding event. Concomitantly, watersheds in the northern sub-basin are frequently degraded as a result of unsustainable land-use practices that increase the likelihood and impact of the above-mentioned risks. Such unsustainable practices also increase the rate of erosion and soil loss, which compromises agricultural productivity in these regions and increases flood risk in downstream areas.

Communities in the Nosiri Khusrav, Kabodiyon and Shaartuz districts, conversely, are increasingly exposed to slow onset hazards such as drought and river bank erosion. In these areas, water availability is the greatest threat to livelihoods. Water availability is limited by poorly functioning irrigation supply infrastructure. This infrastructure is being damaged by: i) high levels of sedimentation from water-borne and wind-borne sediment; and ii) floods in the Kofirnighan River that damage irrigation dams and canals. Floods in the Kofirnighan River also cause riverbank erosion that results in the loss of arable land.

Future climate projections and scenarios

Climate models, developed during the preparation of the Third National Communication, project a number of negative impacts from climate change^{166,167}. Specifically, rising temperatures and an increase in intensity of rainfall events have been predicted ([Figure 7](#)).

Average temperatures in Tajikistan are projected to increase by 2.9°C by 2050¹⁶⁸. By the end of the 21st century, temperatures are projected to further increase in the: i) southern districts of the country (including the districts of Nosiri Khusrav, Kabodiyon and Shaartuz); ii) mountains of central Tajikistan (including those in the KRB); and iii) the mountains of the western Pamir.¹⁶⁹ In addition, diurnal temperature ranges and the occurrence of heat waves are predicted to increase, most notably in the country's southern lowlands. These temperature changes will exacerbate glacial and permafrost melt¹⁷⁰. Glacial cover is projected to reduce by 15–20%, with most small glaciers predicted to disappear in 30–40 years. Ultimately, it is expected that reduced glacial cover will reduce the renewable water resources of Tajikistan.

¹⁶⁶ The climatic models used were the CCSM3, ECHAM5 and CSIRO.

¹⁶⁷ WFP 2017 Climate Risks and Food Security.

¹⁶⁸ Third National Communication 2014.

¹⁶⁹ Ibid.

¹⁷⁰ Dusik J & Seraliev B. 2016. Strategic framework for developing and prioritizing climate change adaptation initiatives in the agricultural sector in Tajikistan. Technical Report. Research Gate.

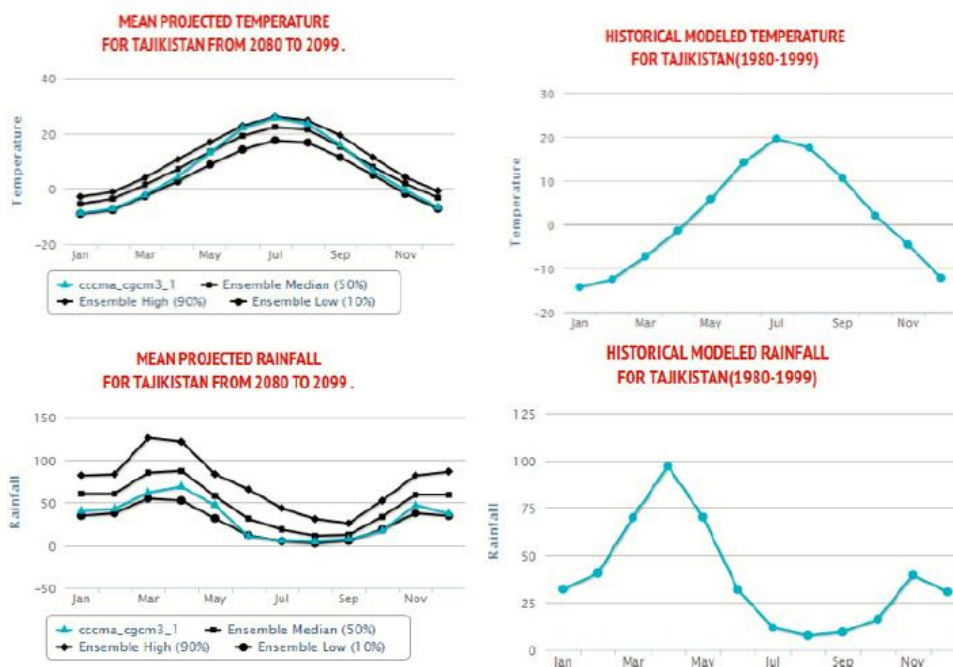


Figure 7. Projected mean temperature and rainfall for 2080–2099 against historically-modelled data for 1980–1999¹⁷¹.

No significant change in mean annual precipitation is predicted by 2050 in Tajikistan¹⁷². However, precipitation patterns will continue to change, resulting in¹⁷³:

- an increased variation in maximum and minimum precipitation levels;
- wetter summers and drier winters, causing both flooding and prolonged periods of drought; and
- an increased rainfall intensity.

These climatic changes will have negative impacts on climate-sensitive sectors, including agriculture, water, energy and transport. For example, a decrease in dry-season water availability will adversely affect the agricultural sector, which in turn increases the risk of food insecurity in the country. Decreasing water availability is also likely to result in a climate change-induced migration of farmers to areas with improved water access. This shift in the population would result in an increase in the number of people living in areas exposed to extreme climate events such as floods and landslides¹⁷⁴. It is predicted that by 2050, ~77% of the country population will be living in areas with considerable exposure to extreme impacts of climate change¹⁷⁵.

Climate change has had negative and lasting impacts on different sectors in Tajikistan. An overview of these impacts on the agricultural, water and energy sectors is provided in the sub-sections below.

Agriculture

The predicted decrease in agricultural yields as a result of decreasing water availability and soil loss will directly impact ~2 million people in Tajikistan¹⁷⁶. Agricultural yields are predicted to decline by as much as 30% by 2100¹⁷⁷, which is likely

¹⁷¹ WFP 2017 Climate Risks and Food Security.

¹⁷² Dusik & Sheraliev 2016 Strategic framework for developing and prioritizing climate change adaptation.

¹⁷³ WFP 2017 Climate Risks and Food Security.

¹⁷⁴ NCCAS 2016.

¹⁷⁵ World Bank (WB). 2013. Tajikistan – Overview of Climate Change Activities. World Bank. Washington, DC.

¹⁷⁶ WB 2013 Tajikistan – Overview.

¹⁷⁷ Schellnhuber HJ, Reyer C, Hare B, Waha K, Otto IM, Serdeczny O, Schaeffer M, Schleußner CF, Reckien D, Marcus R & Kit O. 2014. Turn down the heat: confronting the new climate normal. The World Bank. Washington, DC.

to result in rising food costs^{178,179}. This will cause an increase in poverty levels and a decline in food security in the country¹⁸⁰.

Coupled with a decrease in water availability, *increasing temperatures will result in greater crop evapotranspiration rates*. Farmers will consequently need to alter their planting and harvesting practices to accommodate longer growing seasons while managing reduced water availability for agriculture use. Reduced water supplies in the drier regions of the country are expected to result in major economic losses for farmers¹⁸¹.

Water and energy

Tajikistan's energy production and transmission are predicted to be negatively impacted from changes to precipitation regimes. Energy and water systems are interconnected and therefore any changes in precipitation amounts or an increased drought risk has the potential to adversely affect energy production and supply to the population. For example, changes in river flow and increasing erosion are likely to impact hydroelectric production capacity, while reduced availability of water is likely to increase energy costs for pumping water¹⁸².

Adaptation gaps in Tajikistan

Currently, there are a number of gaps that hinder the effective implementation of climate change adaptation in Tajikistan. Many of these gaps are related to limited institutional and technical capacity for the implementation of adaptation projects to develop the climate-resilience of Tajikistan communities.

Importantly, there is no targeted, national climate change adaptation policy in place in Tajikistan. The two primary national strategies that guide development in the country currently do not include climate change and adaptation. These strategies are the 'National Development Strategy for the Republic of Tajikistan for the period up to 2030' (NDS)¹⁸³ and 'Mid-term Development Programme 2016–2020' (MTDP)^{184,185}. To address this gap, development of the National Climate Change Adaptation Strategy Tajikistan (NCCAS)¹⁸⁶ began in 2016 with a focus on building capacity within the country for climate resilience. The NCCAS is currently in draft form and has yet to come into effect, however the strategy preliminarily highlights the following as focal points¹⁸⁷:

- existing laws, regulations, and codes on environmental protection, energy, drinking water supply, construction, and disaster risk management do not incorporate climate change; and
- policy, strategy, and legislative environments do not incentivise governments to reduce vulnerability and pursue adaptation measures.

In addition to the NCCAS, the Agricultural Reform Programme for 2012–2020¹⁸⁸ lists 'developing agricultural technologies for climate-change adaptation and resilience' as one of 22 specific objectives in Tajikistan¹⁸⁹. However, there is little acknowledgement of climate change challenges in other sectoral policies, including water and health. This limited mainstreaming is compounded by a lack of clear, institutional responsibilities and governance for land and water management at a catchment level. The absence of a cross-sectoral approach to climate change adaptation poses a significant barrier to integrated, landscape-level, adaptive planning.

¹⁷⁸ Heltberg R, Reva A & Zaidi S. 2012. Tajikistan: Economic and Distributional Impact of Climate Change. World Bank Knowledge Brief #50. World Bank. Washington, DC.

¹⁷⁹ World Health Organisation (WHO) Europe. 2009. Protecting health from climate change in Tajikistan. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

¹⁸⁰ NCCAS 2016.

¹⁸¹ Ibid.

¹⁸² NCCAS 2016.

¹⁸³ National Development Strategy for the Republic of Tajikistan for the period up to 2030 (NDS). 2016. Republic of Tajikistan, Dushanbe.

¹⁸⁴ NDS 2016.

¹⁸⁵ Poverty Reduction Strategy for the Republic of Tajikistan for 2010–2012 (PRS). 2010. Republic of Tajikistan, Dushanbe.

¹⁸⁶ NCCAS 2016.

¹⁸⁷ Ibid.

¹⁸⁸ Agricultural Reform Programme for 2012–2020 of the Republic of Tajikistan. 2012. Ministry of Agriculture, Government of Tajikistan.

¹⁸⁹ World Health Organisation (WHO). 2012. Policy – Program on Agricultural Reform 2012–2020/Program of Reforming of Agriculture of the Republic of Tajikistan for 2012–2020. Global Database on the Implementation of Nutrition Action (GINA). Available at: <https://extranet.who.int/nutrition/gina/en/node/14962> [accessed 11.07.2018].

In 2015, the GoT took steps to shift towards managing water resources according to hydrographic rather than administrative boundaries¹⁹⁰. The Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme) aims to promote the implementation of Integrated Water Resources Management (IWRM) at the basin level. Through the programme, River Basin Organisations (RBOs) and River Basin Councils (RBCs) will be established in each of the six identified basins in the country, as well as in sub-basins, where required. RBOs will mainly be responsible for: i) planning the use and protection of water resources annually and in the long-term; and ii) monitoring the distribution of water as well as the state of rivers. Concurrently, RBCs will mainly be responsible for reviewing the plans developed by the RBOs and managing interactions with stakeholders such as water users and Water User Associations (WUAs). RBOs are expected to become operational in 2019, with the GoT being expected to allocate ~US\$160,000 annually towards the operation of RBOs and RBCs. While the Water Reform Programme is likely to modernise water management in Tajikistan, it does not adequately consider the impacts of climate change on the water sector. While climate change impacts are acknowledged to impact water resources, the extent of these impacts is not well understood – particularly at the river basin level. Furthermore, the focus of the Water Reform Programme is restricted largely to water resources management and does not adequately consider the impacts of multiple hazards at the river basin and watershed level. While flood management will be the responsibility of RBOs, other climate-linked hazards such as erosion and landslides are not addressed through the programme¹⁹¹.

The latest version of the PRS, the ‘Living Standards Improvement Strategy of Tajikistan for 2013–2015’ (LSIS)¹⁹², is one of the first non-ecological strategy documents to acknowledge climate change as a threat to development in the country. This acknowledgement has been in response to the reliance on agricultural productivity and disaster risk information from previous hydrometeorological events, including glacial melt. The most recent NDS, for the period 2016–2030¹⁹³, reflects the significance of climate change as a barrier to achieving the desired development goals for the country by 2030.

Climate change expertise currently only exists within a limited number of institutions in Tajikistan, most notably the State Agency for Hydrometeorology (Hydromet) of the Committee for Environmental Protection (CEP). Within these institutions, specialists have either specific skills (e.g. meteorologists, hydrologists) or broader knowledge (e.g. environment, water management) related to climate change and its impacts. As a result, the staff employed by these institutions do not have the technical capacity to recognise the need for climate change adaptation and implementing necessary measures for it.

Since the early 1990s, climate and agricultural research in Tajikistan has been critically underfunded which has resulted in limited scientific capacity. Financial resources are limited and researchers are poorly remunerated¹⁹⁴. The former capacity building and reward systems that functioned under the Soviet Regime are no longer in place, while the existing culture of centralised decision-making limits initiative and innovation.

Moreover, limited recruitment of young researchers has resulted in a cohort of scientific professionals reaching retirement age. Furthermore, limited contact with the international scientific community, and limited English language skills, have resulted in a technology lag which, in turn, has prevented scientists from keeping abreast of scientific advances. Indeed, only recently have initiatives such as the University of Central Asia (UCA) and the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAAARI) have been established in Tajikistan. A brief description of each of these initiatives is outlined below.

- The **UCA** is an internationally chartered not-for-profit secular institution. It was formed as a partnership between the governments of Kazakhstan, the Kyrgyz Republic and Tajikistan under the sponsorship of the Aga Khan Development Network (AKDN). Founded in 2,000, its first campus opened in 2016 in Naryn, Kyrgyzstan and offers five-year undergraduate programmes in Computer Science (BSc) and Communications and Media (BA). In 2017 the Khorog Campus in Tajikistan was opened, offering five-year undergraduate programmes in Earth and Environmental Sciences (BSc) and Economics (BA).

¹⁹⁰ Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme). 2015. Resolution of the Government of the Republic of Tajikistan. Unofficial translation.

¹⁹¹ Water Reform Programme 2015.

¹⁹² Living Standards Improvement Strategy for the Republic of Tajikistan for 2013–2015 (LSIS). 2013. Republic of Tajikistan, Dushanbe.

¹⁹³ NDS 2016.

¹⁹⁴ Central Asian Countries Initiative for Land Management Multi-Country Support Project (CACILM). 2009. Research Prospectus: A Vision for Sustainable Land Management Research in Central Asia. Sustainable Agriculture in Central Asia and the Caucasus. Regional Office of ICARDA for Central Asia and the Caucasus.

- The **CACAARI** was established in 2,000 when leaders of the eight National Agricultural Research Systems (NARS) came together under the aegis of the Consultative Group on International Agricultural Research (CGIAR) Central Asia and the Caucasus (CAC) Program facilitated by the International Centre for Agricultural Research in Dry Areas (ICARDA). The purpose of the organization is to facilitate regional cooperation in agricultural research for development by providing a neutral platform where ideas and experiences can be shared. Moreover, the association acts as a two-way communicative mechanism, supporting information flow between global organizations and local partners. The membership is open to research institutions, universities, NGOs and farmer associations located in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan¹⁹⁵.

Non-climatic problems

There are a number of non-climatic environmental challenges in Tajikistan that are exacerbating vulnerability to climate change. Such challenges include land degradation, which is compromising and poor water supply¹⁹⁶. Following the collapse of the Soviet Union in 1991, previously collectivised farms were divided. The disruptions following this division put pressure on Tajik farmers who had become accustomed to collective structures and living within *avlods*¹⁹⁷. There are now few associations or institutions which support individual farmers, as most present-day state and collective farms work with groups of *dehkan*¹⁹⁸ farmers. A country-wide organisation exists to provide support to the *dehkan* farmers, but small-scale farmers do not benefit significantly from this.

Unsustainable land management practices in Tajikistan – including overgrazing and overploughing on steep slopes – have resulted land degradation, which has been characterised by the reduced productivity of agricultural lands and pastures¹⁹⁹. These unsustainable land management practices have also compromised the supply of water to the population of Tajikistan, specifically by increasing erosion. Accelerated erosion has resulted in an increase in suspended solid material in the Kofirnighan River. This negatively impacts water supply, as suspended solids damage pumps and other water supply infrastructure. These damages increase the treatment costs for producing potable, industrial and irrigation water.

Further to the above-described unsustainable land management practices, the quality and quantity of water in Tajikistan has been affected by deforestation. Firstly, and as with overgrazing and overploughing, deforestation has caused increased erosion in several river basins in the country, including in the KRB. Trees are important for sustaining ecosystem functions in the following ways: i) the high infiltration rate in forests reduces the incidence of surface runoff and reduces erosion transport; and ii) the binding effect of tree roots enhances slope stability, which reduces erosion. Hence, with deforestation, these ecosystem functions are being compromised. Secondly, deforestation has also impacted river flows in Tajikistan and within the KRB. Because trees regulate river flows (specifically through promoting transpiration and infiltration), deforestation in Tajikistan has led to water deficits (droughts) during the dry season and water excesses (floods) during the wet season. With the combined effects of erosion and compromised river flows, deforestation is severely impacting the hydrological functioning in the KRB as well as in river basins throughout Tajikistan.

Problem statement

The problem to be addressed by the proposed project is that the livelihoods of small-scale rural farmers and pastoralists in the Kofirnighan River Basin (KRB) of Tajikistan are being negatively affected by climate change. Rising temperatures and extreme climate events, including floods and droughts, are resulting in: i) damages to crops; ii) increased rates of soil erosion and concomitant declines in agricultural productivity; and iii) damages to properties and infrastructure. These effects are greatly exacerbated by a baseline situation of unsustainable management of land and water resources in the KRB. Future prospects for rural communities in this river basin are limited, with their livelihoods expected to be further threatened as climate change impacts intensify, making sustainable management of their natural resources increasingly challenging.

¹⁹⁵ CACAARI. 10 February 2017. Meeting of the GFARC Steering Committee. Available at: <http://www.cacaari.org> [accessed 23.07.2018].

¹⁹⁶ World Bank Group (WBG). 2008. Tajikistan: Country Environmental Analysis. Washington, DC.

¹⁹⁷ an extended patriarchal family that serves as an informal mutual support structure

¹⁹⁸ A *dehkan* farm is a term for an individual or family farm in Central Asia.

¹⁹⁹ WBG 2008 Tajikistan: Country Environmental Analysis.

Alternative solution and barriers

Preferred solution

The preferred solution would be for the small-scale farmers and pastoralists within the KRB of Tajikistan to become resilient to climate change impacts. This would be achieved by developing and then implementing a climate-resilient catchment management strategy for the KRB, which will enhance the provision of ecosystem services in the river basin. Such a strategy would promote a wide range of new approaches, including: i) long-term planning at the river basin scale, informed by integrated catchment management principles; ii) explicit consideration of the trends, risks and impacts of extreme climate events and their interactions in catchments of various scales iii) consideration of all landscapes (i.e. urban, pastoral, agricultural as well as conservation areas) within the KRB; iv) the use of ecosystem goods and services under climate change conditions to support climate-resilient livelihoods; v) ecosystem-based adaptation (EbA) interventions, including watershed rehabilitation and sustainable management of all natural resources; and vi) the development of appropriate adaptation responses by communities and relevant public services for both sudden- and slow-onset climatic events.

Barriers

Barriers to implementation of the above solution within the KRB include: i) a lack of coherent climate risk information coupled with limited knowledge sharing within the country; ii) weak institutional structures for developing integrated catchment management strategies; iii) limited technical capacity of public services to promote climate change adaptation among communities; and iv) limited knowledge among communities of the benefits of EbA. The activities within the project are designed to overcome these barriers and are detailed in Part II²⁰⁰.

Barrier 1. Lack of systematic production, collection and sharing of climate risk information.

A wide range of projects and programmes have been conducted in river basins across Tajikistan, which have assessed the impact of various environmental and socio-economical factors on the population. However, most of these initiatives have not accounted for climate change and its associated risks, resulting in these risks not being included in basin-level planning and management.

For example, a management plan is in development for the KRB²⁰¹, but does not take an integrated approach to landscape planning and will not include climate risk projections.

The relevant climate information authority in Tajikistan, Hydromet, also lacks the necessary capacity to measure and collect climate risk information. In the KRB, three of the major hydrological stations²⁰² have been identified as having poor performance, with equipment that is poorly maintained. This limitation has resulted in communities in the KRB not receiving advanced climate risk information on events such as flooding or landslides.

An additional limitation is that all information and data being generated on climate and climate change in the country are not currently being housed in a well-managed and accessible information centre. Although centres for storing such information do exist in Tajikistan in the form of hubs or platforms, the relevant institutions do not benefit from the services provided by such centres. Relevant centres include the Open Centre being hosted by the Department of Geology and an information centre being established by the Ministry of Water and Energy. These centres are still in a nascent stage, with a limited capacity for information production, management and sharing. As a result, information on climate risks is not available on a central, readily accessible platform.

With the limited sharing of existing knowledge within the country on climate change risks, there is a significant gap in available knowledge on appropriate adaptation interventions. Specifically, rural Tajik communities have limited or no access to information on climate risks and appropriate adaptation practices.

²⁰⁰ Part II: A, where details on the project components, outcomes, outputs and activities are provided.

²⁰¹ The KRBMP is being developed by Fergana Valley Water Resources Management and is to be completed in 2019. Further details are presented in the environmental context sub-section.

²⁰² These three stations are the Tartki and Chinar on the Kofirnighan River and Romit on the Sardai-Miyona River.

The proposed project will overcome the above barrier in the KRB by: i) strengthening the collection of climate data through rehabilitating identified hydrometeorological stations in the KRB (Outcome 1); and ii) supporting existing knowledge management platforms to improve the systematic collation and sharing of climate knowledge (Outcome 3).

Barrier 2. Limited institutional capacity to include climate change adaptation into river basin management plans and policies, and to apply catchment management approaches to climate risk reduction.

Integrated land and water resource management is particularly relevant under climate change conditions and the associated increase in climate risks. This is because upstream land uses, such as agriculture, affect downstream risks, such as flooding. These interactions between land use and climate risks are complex and not well understood in Tajikistan. This is particularly true for a topographically diverse basin such as the KRB, where both steep mountainous regions and arid lowlands occur. The basin is affected by multiple climate risks but lacks an integrated catchment management approach for the management of such risks.

While a river basin management plan is currently being developed for the KRB under the Water Reform Programme, this management plan will focus on water resources management. Integrated management of land and water resources as well as multi-hazard climate risk management will not be covered by the scope of proposed basin management plan. Consequently, the RBOs and RBCs that will be established in the northern and southern KRB sub-basins will not be capacitated to plan for the implementation of integrated climate risk reduction practices at the basin, sub-basin and watershed scales.

Outcome 1 of the proposed project will overcome this barrier by developing an integrated catchment management strategy for the KRB that will propose measures for adopting a climate risk-management approach. Furthermore, existing co-ordination and training measures will be strengthened to develop the institutional capacity for integrated catchment management. As a result of the outputs under Outcome 1, the GoT will be capacitated to implement specific climate-resilient catchment management throughout the country, beyond the target basin.

Barrier 3. Limited technical capacity of local government to implement adaptation activities that promote climate resilience within local communities.

Local government authorities in the KRB currently lack the knowledge and expertise to monitor extreme climate events, transmit early warning information and take adequate and appropriate response measures to manage climate risks. This limitation results in local KRB communities receiving minimal training and information on climate change adaptation. In particular, public services from local government that provide climate advisories, agricultural extension services and livestock health services do not take climate risks into account. The end result is that local communities: i) are not being regularly updated on local, regional nor international best practices for reducing the impacts of climate change; and ii) are not being made aware of climate risks in time to take adequate action.

The proposed project will overcome this barrier by: i) strengthening the capacity of local government to implement adaptation activities (Outcome 1); and ii) strengthening local communities' knowledge and capacity to implement relevant adaptation measures through local demonstrations.

Barrier 4. Limited knowledge among communities of livelihood benefits from implementing climate risk reduction and EbA measures.

Farmers and pastoralists in Tajikistan have had limited exposure to EbA and its benefits for reducing the impacts of climate change as well as improving livelihoods. This is particularly true for communities in the KRB, where there have been limited climate change projects and initiatives. Consequently, KRB rural community members do not have the technical capacity to implement EbA interventions and are also not incentivised to do so. Because of this limitation in climate change projects and initiatives within the KRB, communities have not been exposed to demonstration plots that showcase the benefits of EbA activities for improving climate resilience. It is also unlikely that rural community members in KRB will autonomously implement EbA interventions because farming practices in the country have shown limited innovation since the end of the Soviet era.

Community knowledge on EbA will be developed through on-the-ground implementations of EbA in degraded watersheds throughout the KRB. Knowledge sharing will be facilitated through Farmer Field Schools (FFS), where community members will have the opportunity to learn local best practices in a locally appropriate manner. Communities will also be

engaged through participatory land-use planning to develop Watershed Action Plans (WAPs). These WAPs will guide the systematic implementation of EbA interventions to reduce the vulnerability of rural communities in the KRB.

PROJECT OBJECTIVE:

The objective of the proposed project is to enhance the livelihoods of the small-scale farmers and pastoralists living in the Kofirnighan River Basin under future climate change conditions. Such conditions are expected to include increased frequencies and intensities of extreme climate events such as intense rainfall, flooding and droughts. Three interrelated outcomes within the project (detailed in Part II²⁰³) will contribute to achieving this objective, namely: i) catchment management strategy to manage climate risks operationalised at *raion* and *jamoat* levels in the KRB; ii) an integrated approach to building the climate resilience of agro-ecological landscapes operationalised at a village level; and iii) existing knowledge management platforms supported for integrated catchment management and EbA.

The overarching approach of the project is to employ integrated catchment management within the KRB. To this end, a climate-resilient catchment management strategy will be designed for the basin which will enable national rural development planners, local government and local communities to manage a wide range of climate risks. As noted in the introduction of this document, this strategy will be underpinned by the following concepts and principles:

- climate change can cause or exacerbate multiple hazards (e.g. GLOFs, floods, mudflows, landslides, soil erosion and drought), all of which need to be taken into account when designing adaptation measures;
- management of climate risks needs to be tailored for a particular spatial scale (e.g. catchment or watershed);
- there are complex upstream-downstream interactions (involving flooding and erosion processes) that need modelling before effective adaptation interventions can be designed;
- long-term development planning for the KRB will require careful consideration of the multiple hazards associated with climate change;
- a cross-sectoral approach, which takes linkages between sectors (e.g. agriculture, conservation, energy and water) into account, is required for effective adaptation;
- a landscape approach that considers urban environments, rural villages, agricultural fields and all ecosystems (forests, pastures) is critical for managing climate risks in the long-term; and
- adaptation in the KRB will require considerable investment in EbA interventions that increase the supply of critical ecosystem goods and services under conditions of climate change.

With regards to the project's implementation of EbA within the KRB, communities will be trained on EbA interventions for managing pastoral, forest and agricultural landscapes at a watershed scale under climate change conditions. These interventions will follow the principles of sustainable land management (SLM) and climate-smart agriculture (CSA) wherever applicable. The training will be targeted, in particular, at the *raion* (district) and *jamoat* (sub-district) levels. In so doing, the project will enhance support services to villages and enable participatory, local-level planning. The lessons learned from the project will enable a policy and investment framework to be developed for replicating and scaling up EbA interventions across the country. Existing knowledge management platforms and hubs will be used for promoting this replication and upscaling. The project's climate resilient catchment management approach, lessons learned and best practices will inform and contribute to the ongoing process of water sector reform in Tajikistan. As noted above, the country is currently undergoing water sector reform that among other includes the development of the river basin plans and the establishment of the River Basin Organisations (RBOs). The project will closely align with these processes to integrate the EBA methods at the catchment level that are to yield significant water and land management benefits in the face of increasing climate change risks. Integration of the project defined adaptation strategies into the basin plans and RBO activities will enable replication and upscale. Furthermore, the project will closely coordinate with the National Adaptation Plan (NAP) process that is ongoing with UNDP's support to embed necessary policy measures across all priority sectors for further scale up. As part of this process, adaptation measures will be mainstreamed into four priority sectors (Energy, Water, Transport and Agriculture). Lessons learned and best practices from the Adaptation Fund project will inform the ongoing NAP development process to ensure that project activities and the climate-resilient catchment management approach are scaled up across all basins of the country. Furthermore, the project lessons and the best adaptive practices as well as the project generated climate risk information will also inform the ongoing process of water reform in Tajikistan.

²⁰³ See Part II: A, which gives a project overview and details the components, outcomes, outputs and indicative activities of the project design.

Each of the proposed project’s activities have been designed to address the climate change problem described in Part II²⁰⁴, and to contribute to overcoming the barriers described above.

PROJECT COMPONENTS AND FINANCING

The duration of the project is proposed to be five years (60 months) beginning in 2020 and ending in 2024.

Table 5 presents the proposed components, expected outcomes, concrete outputs and indicative activities of the project, which are further detailed in Part II²⁰⁵. During the development of the Full Proposal, the activities were outlined to ensure their alignment with national target areas. A detailed breakdown of costings per activity is provided in Part III²⁰⁶.

Table 5. Project components, expected outcomes and an outline of concrete outputs, with component-level grant amounts.

Project Components	Expected Outcomes	Expected concrete Outputs	Amount (US\$)
1. Integrated catchment management to build climate resilience.	1. Catchment management strategy to manage climate risks operationalised at <i>raion</i> (district) and <i>jamoat</i> (sub-district) levels in Kofirnighan River Basin (KRB).	1.1. Multi-hazard climate risk model developed for target watersheds in the KRB.	1,012,000
		1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.	
		1.3. Integrated catchment management strategy developed for the KRB.	
		1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	
		1.5. Payment for Ecosystem Services models developed for the KRB.	
2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.	2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	2.1. Agro-ecological extension services supported at the <i>jamoat</i> level to provide technical support for EbA implementation.	7,282,810
		2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target watersheds.	
		2.3. EbA interventions implemented in target watersheds by local communities.	
3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.	3. Existing knowledge management platforms supported for integrated catchment management and EbA.	3.1. <i>Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.</i>	142,500
		3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.	
4. Component sub-total			8,437,310
5. Project Execution cost (9.20%)			776,000
6. Implementing Entity Fee (8.5%)			783,131
7. Total Project Cost			9,996,441

PROJECTED CALENDAR

The projected timeline for the proposed project is a five-year implementation from 2020–2024. Estimated milestones are outlined in Table 6.

²⁰⁴ See Part II: A, which gives a project overview and details the components, outcomes, outputs and indicative activities of the project design.

²⁰⁵ Ibid.

²⁰⁶ See Part III: G, which illustrates the budget and detailed budget notes.

Table 6. Projected milestones and expected timeline for the proposed project.

Milestones	Expected dates
Start of Project Implementation	January, 2020
Mid-term Review	June, 2022
Project Closing	March, 2024
Terminal Evaluation	June, 2024

PART II: PROJECT JUSTIFICATION

A. PROJECT COMPONENTS

To achieve its objective of enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan, the proposed project focuses on strengthening the integrated management of the KRB and implementing concrete on-the-ground EbA interventions. The three components of the project are: i) integrated catchment management to build climate resilience; ii) Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes; and iii) knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin. The first component will strengthen the institutional and technical capacity of government and local communities to manage climate risks. The second component will support local communities to implement interventions that reduce climate risks by enhancing the ecosystem functionality of degraded watersheds. The last component will compile and disseminate lessons learned for future national and regional upscaling and replication.

The outcomes, concrete outputs and indicative activities under each component are described below.

Component 1. Integrated catchment management to build climate resilience.

The GoT has initiated a water sector reform²⁰⁷ that will result in water resources being managed according to hydrographic boundaries rather than administrative ones. For the KRB, this will result in the establishment of River Basin Organisations (RBOs) and River Basin Councils (RBCs) in the northern and southern sub-basins by the end of 2019. While this will strengthen the management of water resources throughout the KRB, the KRB Management Plan (KRBMP) that is being developed will not address: i) the linkages between land and water management and the consequent impacts on climate risks; and ii) the importance of an EbA approach to risk reduction at the watershed level. Consequently, Component 1 has been designed to build on the KRBMP that is currently being developed and facilitate climate-resilient integrated catchment management in the KRB.

Outcome 1. Catchment management strategy to manage climate risks operationalised at raion (district) and jamoat (sub-district) levels in Kofirnighan River Basin.

Under this outcome, integrated land and water resources management principles will be introduced to Tajik authorities at the *raion* and *jamoat* levels to effectively address the climate change impacts described in Part I²⁰⁸. An integrated, climate-resilient catchment management strategy for the KRB will be developed using a multi-hazard climate risk approach. This strategy will detail the climate risk scenarios in each KRB watershed and will provide the *raion* and *jamoat* government levels with guidelines for managing these risks. This will enable climate-resilient land-use management in the KRB.

Outcome 1 will be achieved through five linked outputs. These outputs will: i) contribute towards improved transparency on multi-hazard climate risks throughout the KRB through risk modelling and improved climate data production; ii) develop a cross-sectoral strategy for managing these risks throughout the KRB by using an integrated catchment management approach; iii) strengthen the capacity of government bodies and local communities for managing climate risks

²⁰⁷ Water Reform Programme 2015.

²⁰⁸ See Part I: Project Background, on the climate change context in Tajikistan.

by implementing EbA; and iv) incentivise ecosystem management as a risk management approach by developing a framework for a Payment for Ecosystem Services (PES) approach.

Output 1.1. Multi-hazard climate risk model developed for vulnerable watersheds in the Kofirnighan River Basin.

A gap analysis will be conducted based on all available information that covers the KRB, including baseline projects and the ongoing assessment being conducted as part of the KRBMP²⁰⁹. It is expected that the outputs of the KRBMP will include watershed delineation for the KRB, as well as information on water scarcity at the watershed level. However, it is not expected to include information on risks related to water access and climate change impacts on basin hydrology. The gap analysis will inform the identification of watershed-level risks to be prioritised for the north and south sub-basins of the KRB.

Under this output, priority risks, which will include flooding and landslides, will be modelled at the watershed level for the north and south KRB sub-basins. For climate-specific risks – which also include floods, landslides and droughts – downscaled climate predictions will be included in the risk models. These models will inform the development of cohesive Multi-Hazard Climate Risk Models (MHCRMs) for the KRB.

The MHCRMs will be used to inform the development of detailed Watershed Action Plans (WAPs) under Outcome 2. In addition, the models and their results will be archived and disseminated through knowledge centres that will be supported under Outcome 3.

Indicative activities to be implemented under Output 1.1 are detailed below.

Activity 1.1.1. Conduct a gap analysis on existing risk information in the Kofirnighan River Basin.

A detailed gap analysis will be conducted on the KRBMP. The analysis will be informed by existing information on *inter alia*: i) the vulnerability of the KRB; ii) baseline projects in the KRB and surrounding regions; iii) the ongoing assessment for the development of the KRBMP²¹⁰; and iv) water availability in the KRB. The collation of data on water availability will support the assessment of identified climate risks²¹¹ as well as producing the climate change projections that will inform the MHCRMs [Activity 1.1.3²¹²].

The gap analysis will take into account all recommendations and watershed delineations made through the KRBMP assessment. If the assessment does include watershed delineations, the design of the integrated catchment management strategy for the KRB will refer to those delineations.

Once the gap analysis has been completed, missing primary data will be collected for the KRB. Satellite imagery will be used to obtain land use, vegetation cover and slope data. Where existing data on soils is limited, ground-truthing studies will be conducted. For watersheds that are expected to be particularly vulnerable, satellite imagery will be supplemented with topographic models derived from high-resolution drone imagery.

To accurately consider the impacts of climate change on the risk profile of the KRB, regional climate change predictions will be downscaled. These downscaled predictions will be used in Activity 1.1.2 to inform the climate risk models.

Activity 1.1.2. Develop Multi-Hazard Climate Risk Models for the Kofirnighan River Basin.

Multi-Hazard Climate Risk Models (MHCRMs) will be developed at the watershed scale for the KRB. These models will be calibrated with historical data, but will also be run using downscaled climate change predictions developed under Activity 1.1.1. Notably, multi-hazard models will consider the relationships between different types of hazards. In many cases, the onset of one hazard alters the likelihood or impact of another hazard. For example, a GLOF may result in river bank destabilisation that could trigger a landslide event. Similarly, landslides and other forms of mass movement may alter

²⁰⁹ scheduled to be completed in 2019

²¹⁰ scheduled to be completed in 2019

²¹¹ Validation of the identified climate change risks for the KRB is being conducted under Activity 1.1.2.

²¹² Use of square brackets is specifically to highlight linkages between outcomes, outputs and activities.

river morphology and increase the risk of flooding. These interactions may be closely linked temporally and spatially (e.g. a GLOF triggering a landslide). Conversely, some hazards may interact across larger temporal and spatial scales; for example, rapid erosion upstream in a catchment may result in downstream sediment accumulation, which slowly increases downstream flood risk.

In this activity, priority hazards such as GLOFs, floods, mudflows and landslides will be modelled for the KRB. While different priority risks have been identified in both the north and south sub-basin of the KRB, the vertical linkage between the two regions will markedly impact the risk profile. In particular, land uses in the northern sub-basin (upstream area), will have impacts on the southern sub-basin (downstream area) risk profile. For example, inappropriate land uses in the upstream areas could result in increased sedimentation, erosion and landslides, as well as reduced dry season water availability, in the downstream areas. Conversely, upstream land uses that maintain the ecosystem functionality of watersheds will result in downstream benefits of drainage control, flood reduction, improved water quality and increased dry season water flow.

Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.

Currently, there are 11 weather stations across the KRB, which equates to an approximate density of one station per 1,000 km². This is regarded as an appropriate density^{213,214} according to WMO guidelines²¹⁵. Notwithstanding this, existing weather stations throughout Tajikistan face technical challenges, limited automation and problems regarding data quality. In addition, weather stations are being degraded because of insufficient resources and technical capacity to rehabilitate them following extreme climate events.

Under this output, the State Agency for Hydrometeorology (referred to hereafter as ‘Hydromet’) will be supported by providing capacity building to repair existing weather stations in the KRB. Support to Hydromet will also be provided in the form of equipment for the rehabilitation and upgrading of selected weather stations. This support will improve the quality and quantity of hydrometeorological data that is collected from the weather stations. Collected data will contribute to building an in-depth understanding of the climate change risks on different soil types and land units. The data will also be used to: i) refine the MHCRCMs (Output 1.1); and ii) deliver climate risk information and adaptation advisories to agro-ecological extension service providers (Output 2.1). Weather data will be disseminated under Output 3.1.

Indicative activities to be implemented under Output 1.2 are detailed below.

Activity 1.2.1. Provide technical support for the modernisation of automated weather stations in the most vulnerable districts of the Kofirnighan River Basin.

In order to provide relevant and up-to-date climate risk information and associated advisories for rural farmers and pastoralists in KRB, weather stations need to be regularly updated. In addition, following extreme climate events, weather stations should be inspected for potential repair needs. Existing weather stations within the KRB, although regarded as operational, are in need of rehabilitation. This is in response to limited resources for regular inspections following extreme climate events that have resulted in the stations undergoing significant wear and tear²¹⁶.

Of the 11 total weather stations in KRB, 3 have been identified for rehabilitation and modernisation, namely ‘Tartki’ and ‘Chinar’ situated on the Kofirnighan River, and ‘Romit’ on the Sardai-Miyona River. The rehabilitation will ensure that the three stations are capable of procuring a greater density of data required for the climate projections for their respective areas.

Hydromet will be supported through this activity by providing training to relevant technical personnel on the ongoing maintenance of weather stations, as well as repairs following extreme climate events. In addition, required equipment will be provided to Hydromet under this activity to rehabilitate the existing three identified weather stations. Support will also

²¹³ Third National Communication 2014.

²¹⁴ World Meteorological Organization (WMO). 2008. Guide to Meteorological Instruments and Methods of Observation. Seventh Edition, WMO-No. 8.

²¹⁵ World Meteorological Organization (WMO). 2018. Country Profile Database: Tajikistan Regional Association II (Asia). Available at: <https://www.wmo.int/cpdb/tajikistan> [accessed 19.07.2018].

²¹⁶ Currently, KRB weather stations frequently collect unreliable or insufficient data. Therefore, high-quality climate information cannot be disseminated to the respective end-users. Automated data collection protocols will be implemented at all weather stations in the KRB and suitable data management software will be acquired. This software will ensure that data collected by weather stations is accurate and that all data is safely stored.

be provided to install stream gauging equipment. This equipment will include sensors to automatically measure stream velocity, depth, width and water turbidity, as well as supporting infrastructure. Supporting infrastructure will include cabling, observer cabins and electric drum winches (details of hydrometric equipment are presented in Annex 5).

Activity 1.2.2. Collect and collate data from improved automated weather stations.

All data and information from both existing and supported automated weather stations [under Activity 2.1.1] will be collected. This data will be collated for dissemination through the existing knowledge centres in the country [Outcome 3] for analysis and further dissemination in usable formats. In addition, historic records dating back 100 years will be digitised.

To date, data collected from weather stations have been digitally archived through the process of scanning written records. However, this data is not usable for the necessary analysis that should take place in order to inform climate risk projections because it is in image format. In light of this shortfall, this activity will involve using Intelligent Character Recognition (ICR)²¹⁷ software to automatically convert scanned images into machine-readable data. This will significantly improve the historical weather records for the KRB and will be considered an innovative advance in climate data management capability in the country.

Activity 1.2.3. Use collected data to inform climate risk information and adaptation advisories for agro-ecological extension service providers.

The collected and collated data from available automated weather stations in the KRB [under Activity 2.1.2] will be fed into the existing knowledge management centres supported under Outcome 3. This data will then be used to develop climate risk and advisories for farmers and pastoralists. Adaptation advisories will be tailored to the local needs based on the collected data as well as existing climate forecasting for the country. Mobile service providers will be engaged with to identify partners for the long-term and to ensure sustainability of advisory delivery. Advisories will be disseminated to all agro-ecological extension service providers in KRB so that they are able to make informed decisions on adaptation recommendations.

By developing and disseminating advisories, the adoption of climate-resilient and high market-value crop and seed varieties will be promoted. These seed varieties include Lucerne (*Medicago sativa* L.) and sainfoin (*Onobrychis viciifolia* Scop.)²¹⁸. Not only will advisories inform the selection of crops that take climate risks into account, they will inform alternative agricultural options for communities. Such options could include introducing fodder production into agricultural practices and establishing agroforestry and intercropping practices. The introduction of alternative land-use options will result in increasing soil fertility and conservation of natural resources for valuable ecosystem services for future seasons²¹⁹.

Included in the advisories will be guidance on planting time and season specific to the target areas. The guidance will include suggested crop types, timing of planting and reason for selection.

Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.

Under Output 1.3, an integrated catchment management strategy will be developed for the KRB. This strategy will outline how to implement integrated land and water resources management in watersheds throughout the KRB in order to manage climate risks. The strategy will address the linkages between upstream and downstream impacts at the river basin scale and outline approaches for identifying and managing such impacts at the watershed scale.

The integrated catchment management strategy will further inform the KRBMP that is currently being developed. RBOs and RBCs in the KRB will be closely involved in the development of the strategy. Staff from RBOs and RBCs, along with relevant staff from CEP, Agency for Land Reclamation and Irrigation (ALRI) and local government at *raion* and *jamoat*

²¹⁷ ICR is an advanced optical character or handwriting recognition software system that enables different fonts to be learned by a computer. This system has been used to improve accuracy and recognition levels within data collection and analysis.

²¹⁸ FAO. 2008. State of Plant Genetic Resources for Food and Agriculture (PGRFA) in the Republic of Tajikistan: Country Report. By Prof. Dr Hafiz Muminjanov, Dushanbe.

²¹⁹ FAO 2008 PGRFA: Country Report.

levels will be trained on the implementation of the strategy. Strategic approaches and objectives of the strategy will be operationalised at *raion* level through District Development Plans (DDPs).

Indicative activities to be implemented under Output 1.3 are detailed below.

Activity 1.3.1. Develop an integrated catchment management strategy for the Kofirnighan River Basin to inform and facilitate cross-sectoral landscape planning.

This activity will build on the training provided under Activity 1.3.2 to develop an integrated catchment management strategy for the KRB. Relevant government authorities will be included in the design of the strategy to ensure that it is coherently linked with existing sectoral and local level policies. The strategy will detail how the identified climate risks [under Activity 1.1.2] will be managed using a cross-sectoral approach to integrated catchment management. The strategy design will consider all relevant individual sector mandates and align their objectives within the context of integrated management for the KRB.

Based on the MHCRMs [developed under Output 1.1], the strategy will provide guidance on risk management at various catchment scales within the KRB. This means that factors such as soil erosion and flood risk will be incorporated into cross-sectoral land-use planning to facilitate efficient management across all relevant government sectors. These sectors include *inter alia* water, environment, agriculture, and education.

The strategy will provide overall guidance for the integrated management of watersheds by local communities. This guidance will ensure that WAPs developed under Outcome 2 take downstream impacts into consideration and that interactions between different watersheds are accounted for in a strategic manner.

Activity 1.3.2. Deliver a training programme on mainstreaming climate risks for integrated catchment management planning.

Relevant government and academic staff, of which at least 30% will be women, will be trained on mainstreaming climate risks into integrated catchment management planning. Identified agencies include CEP, Hydromet, MEWR, ALRI, the Department of Geology (DoG), RBOs of the KRB and UCA. Additional agencies and entities to be trained will be identified during the project inception phase. These partners will be trained on international best practices for integrating climate risks into integrated catchment management. In addition, this training will include identifying relevant risk management measures for existing and emerging climate risks. The overall objective of the training programme will be for relevant institutions, government levels and departments to effectively implement an integrated catchment management strategy for managing the impacts of climate change.

Trainings will be tailored to the specific needs of the department/institution to ensure that all partners acquire equal knowledge on the most appropriate mechanism for integrated management. All relevant sectors will be included to ensure that – although mandates will continue to differ slightly – the goals of each align with the strategy for the KRB.

Sub-activities for the trainings under Activity 1.3.2 are outlined below.

- 1.3.2.1. Training conducted to relevant CEP representatives to integrate catchment management into implementation and monitoring activities for all projects going forward, both those with a focus on climate change and without.
- 1.3.2.2. Training provided to the personnel of the supported knowledge management centres – including the DoG Open Centre and to UCA – on assessing available climate risk information and ensuring it is all made available through the relevant portals/hubs.
- 1.3.2.3. Training provided to *raion*- and *jamoat*-level government departments on integrated catchment management and identifying climate risks that require such a management approach.

Activity 1.3.3. Provide training for selected communities on identification of EbA activities and implementation.

Rural communities across the six identified most vulnerable districts of the KRB will be selected for training on identifying and implementing appropriate EbA interventions. These identified six districts include Vahdat, Varzob and Faizobod Districts in the north of the KRB and Nosiri Khusrav, Shaartuz and Kabodiyon Districts in the south of KRB²²⁰. From these

²²⁰ Details on these six districts are provided in Part I, where the environmental context of Tajikistan is described.

districts, it is expected that communities in ~100 villages across 14 *jamoats* will benefit from training on EbA interventions. Women will be encouraged to participate in these training activities, and of the total number of community members trained, at least 30% will be women.

The selected communities will be trained by representatives from those institutions trained under Activity 1.3.2, including district and *jamoat* representatives of CEP. This training-of-trainers (ToT) approach will build the capacity of selected communities to identify climate risks, and to design and implement appropriate EbA interventions. All trainings will be delivered in local Tajik dialects specific to each target district. This will ensure that trainings are accessible to all participants.

Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.

Relevant co-ordination and training mechanisms will be strengthened for the implementation of integrated climate-resilient catchment management. Co-ordination structures to be strengthened include the RBOs and RBCs in the KRB. These entities are currently being established and, by project inception, will have been capacitated on water management at the catchment level. The proposed project will build their capacity on climate-resilient catchment management that includes land use as well as the management of water resources under climate change conditions. Training on cross-sectoral management will be provided to RBOs and RBCs in the KRB, as well as *raion* and *jamoat* level staff. This training will strengthen the existing coordination structures in the KRB to include integrated and climate-resilient management of land and water resources.

Opportunities for establishing/supporting existing local training mechanisms will be identified. Currently, no institutionalised or systematic training mechanisms exist for farmers and pastoralists.

Indicative activities to be implemented under Output 1.4 are detailed below.

Activity 1.4.1. Strengthen existing training mechanisms at the *raion* and *jamoat* levels.

Under this activity, existing training programmes will be strengthened at the *raion* and *jamoat* government and administration levels. The programmes will be adopted from existing mechanisms within the *raion* and *jamoat* government for targeted catchment and/or watershed management. Improved training programmes will include coordination mechanisms for integrating holistic landscape management practices through the integrated catchment management strategy [Output 1.3]. Trainings will be coordinated between the RBOs and RBCs to ensure that the process of continued training is adopted into regular management within the government.

Activity 1.4.2. Provide training on integrating EbA into catchment management.

Following on from Activity 1.4.1, the strengthened training programmes will be carried out for *raion* and *jamoat* level government officials in the targeted districts²²¹. The training will focus on providing support for agro-ecological extension services and will include EbA measures as part of an integrated approach to management. Main recipients of this training will include RDPP, CEP and *jamoat* government-level officials to ensure that the administrative and organisational processes are strengthened for EbA implementation.

This training will be linked with activities under Output 2.1 where community demonstration plots of EbA interventions will be established [under Activity 2.1.2] and farmer field schools will be conducted [under Activity 2.1.3]. All trainings will be delivered in local Tajik dialects specific to each target district. This will ensure accessibility to all willing and necessary participants.

Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.

Payment for Ecosystem Services (PES) has been identified as a viable approach for conserving the supply of ecosystem goods and services of Tajikistan under climate change conditions. Currently, no viable models for PES have been

²²¹ Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon Districts.

identified in the KRB. However, there are a number of ecosystem services within the KRB that could be eligible for a PES approach. These include water provision, flood reduction, sediment retention and biodiversity conservation. The activities of this project will support the delivery of the above ecosystem services and, consequently, the possibility of implementing PES in the KRB will be investigated under this output.

Activity 1.5.1. Develop suitable Payment for Ecosystem Services models for the KRB.

Under this activity, appropriate PES models will be developed for the KRB. Relevant ecosystem services will be identified, such as water provision from restored and ecologically-sound watersheds. Willing buyers and willing sellers for each ecosystem service will be identified and engaged with to determine: i) the feasibility of PES for a particular ecosystem service; and ii) pricing structures for PES-compatible ecosystem services. Where willing buyers and willing sellers of a particular ecosystem service have been identified, potential intermediaries will be engaged with. Intermediaries may include government entities, NGOs and financial institutions. Negotiation platforms will be established between buyers, sellers and intermediaries to determine prices and payment methods for the delivery of ecosystem services.

Component 2. Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.

Adaptation measures such as EbA are increasingly being recognised as a cost-effective approach for building the climate resilience of vulnerable communities. In the context of watersheds, EbA interventions are most effective when implemented in degraded landscapes. In the KRB, many watersheds are degraded because of unsustainable land management practices – such as overgrazing and deforestation – and the impacts of climate change. These watersheds are prone to increased risks of flooding, mudflows and landslides and are characterised by low agricultural productivity. Implementing EbA interventions such as erosion control measures, agroforestry and sustainable pasture management in these watersheds will restore ecosystem services of flood reduction, soil stabilisation and increased water availability. Concomitantly, these interventions will provide long-term benefits to local communities by: i) providing climate-resilient and ecologically-sound livelihood opportunities; and ii) reducing both the likelihood and impact of climate risks.

EbA interventions for watershed management function optimally as part of an integrated upstream-downstream approach that considers risk avoidance and risk protection. For example, if a watershed is prone to flooding, EbA interventions in the upstream areas can promote ecological processes of flood attenuation and runoff infiltration that reduce downstream flood impacts. Downstream communities can then be further protected by combined grey-green infrastructure such as reinforced river banks that are stabilised with riparian vegetation. Under Component 2, vulnerable watersheds in the KRB will be climate-proofed through the implementation of integrated watershed management with a focus on an EbA approach that provides long-term benefits to local communities.

Outcome 2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.

The integrated catchment management strategy developed under Outcome 1 will inform development across all economic sectors at a catchment scale in the KRB. It will not, however, be sufficiently detailed to inform land-use management practices at a watershed scale. Outcome 2 will consequently include the development and operationalising of Watershed Action Plan (WAPs). These plans will have an overarching focus on addressing climate risks, thereby ensuring full alignment with the catchment management strategy [developed under Output 1.3]. A total of six districts²²² have been identified for EbA implementation, namely Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon. This implementation will serve to demonstrate the cost-effectiveness and adaptation benefits of such EbA interventions.

Under this outcome, an integrated approach for building community resilience to climate change will be established, demonstrated and subsequently implemented. This approach will be informed by detailed WAPs and community enterprise plans that will focus on building the climate resilience of the communities.

²²² Refer to the Part I sub-section on the environmental context in Tajikistan for details on these districts.

There are four outputs to achieve the above-described outcome. These outputs are interlinked through the respective activities by providing support to communities and implementing EbA activities in target regions. The four outputs and their indicative activities are detailed below, including linkages between the three project outcomes.

Output 2.1. Agro-ecological extension services supported at the *jamoat* level to provide technical support for EbA implementation.

Agro-ecological extension services are currently provided by private enterprises – largely agronomists – at the *jamoat* level on an ad-hoc basis in response to farmer requests. Through a ToT approach, these service providers will be supported to ensure that communities have access to the necessary guidance for effectively implementing EbA.

Indicative activities to be implemented under Output 2.1 are outlined below.

Activity 2.1.1. Support agro-ecological extension services by training existing service providers on EbA, climate-resilient agriculture and multi-hazard climate risk management.

Currently, agro-ecological extension services are being provided to farmers and pastoralists by private enterprises at the *jamoat* level. Under this activity, these existing service providers will be supported to ensure that communities have access to the necessary guidance for effectively implementing EbA. This support will be through a ToT approach that ensures all knowledge sharing is ongoing among *jamoats* and communities. Training will include a focus on EbA, climate-smart agriculture (CSA) and sustainable land management (SLM) to ensure that an integrated approach to management is adopted following the provision of extension services. By providing additional training on multi-hazard climate risk management, existing extension service providers will be informed of the relevant and up-to-date technologies for climate information.

The ToT programme provided to the existing agro-ecological extension service providers will include training on specific processes that are essential to implementing an effective integrated catchment management strategy. These specific processes include measures on EbA, CSA and SLM that all contribute to improved river and water management. The processes are outlined below.

- **Developing land-use plans (LUPs) that take into account all natural resources within and surrounding a particular area.** Efficient land-use planning will prevent social conflicts over land and ensures the sustainable use of available resources. LUP could involve the implementation of rotational grazing and/or cropping as well as intercropping or alternate harvesting. In this way, LUP contributes to increased soil fertility and improved productivity. The ToT programme will train extension service providers on developing land-use plans for specific areas within the target districts. Importantly, this training will differ between regions and within districts because of considerable variability in landscapes.
- **Developing implementation protocols for EbA that are specific to particular soil types, ecosystems and landscape units.** Together with LUP, such implementation protocols will assist with ensuring maximum sustainability of all available resources. Such protocols make use of previous seasons' experiences and outputs to adapt for future seasons. Training to extension services providers will be focused on the process of identifying potential EbA measures to be implemented in a specific region. The training will also include how to determine the appropriate intervention according to the landscape and needs of the community.
- **Training extension service providers on the technical implementation of EbA, including theoretical and practical aspects.** This is because the providers are private enterprises, meaning that farmers may often request guidance rather than hands-on assistance. Extension services consequently need to be able to describe in detail the identified EbA measure as well implement it on the ground.
- **Connecting agricultural producers to markets.** Improving market connectivity among agricultural producers will be a focus in the training of extension service providers. Currently, the existing extension services are not adequately trained or equipped to guide the farmers towards the EBA, including CSA solutions. Neither are the farmers aware of productive benefits of EBA and CSA options or related market opportunities.
- **Introducing agro-processing to extension service providers.** Through agro-processing, there will be added value to primary agricultural products. Training will focus on what the different options are for processing/transformation of raw and intermediate products and how it could benefit the communities in terms of increase in incomes and greater adaptive capacity.

- **Training extension service providers on post-harvest storage handling.** This will promote the use of post-harvest storage facilities among Tajik farmers to reduce crop losses due to climate events and to improve prices received at markets. Training will include the appropriate steps immediately following harvest such as cooling, cleaning, sorting and efficient packing.
- **Training farmers on improving livestock productivity.** With climate change, farmers are likely to become more reliant on their livestock for their livelihoods. By focusing on supporting the health and nutrition of livestock, the resilience of local communities will be improved. Such examples of guidance would be to establish small fodder production units for livestock and to shift from an entirely plant-based diet to a semi-animal-based protein.
- **Developing advisories from climate risk information received from Hydromet.** These advisories will be delivered to farmers to inform their decision-making for the season ahead.

Activity 2.1.2. Establish EbA demonstration plots in each of the target villages.

Under this activity, community demonstration plots will be established in the target villages. These plots will consist of the main EbA interventions to be implemented. The training provided under Activity 1.4.2 will serve as the base for the implementations of these plots. These demonstration plots will be the main platform for: i) demonstrating enhanced crop and livestock productivity; ii) training farmers and pastoralists on the technical details of how to implement EbA interventions; and iii) demonstrating how the interventions reduce climate change-induced soil erosion.

The EbA measures included in the demonstration plots will be selected from the shortlist of EbA interventions to be developed under Activity 2.2.2. Examples of the measures that have been identified as successful and/or potentially successful in the KRB are described in [Table 7](#).

Table 7. EbA measures that have been identified as successful/potentially successful in the KRB. In the ‘Applicable area’ column, ‘N’ denotes the northern sub-basin while ‘S’ denotes the southern sub-basin.

No.	Description	Applicable area
1	Construction of ‘protection’ gabions along rivers to provide buffers during flash floods.	N,S
2	The introduction of water-saving irrigation techniques such as drip irrigation, dry farming, composting/mulching and making use of cover crops.	N, S
3	Rehabilitation/restoration of degraded forest ecosystems making use of <i>saxaul</i> species, as well as others.	N, S
4	Sustainable harvesting for livelihoods from existing ‘healthy’ forest ecosystems.	N
5	Establishing livestock exclusion zones for the growing of fodder crops such as Lucerne and sainfoin.	N, S
6	Establishing shelterbelts to reduce the deposition of wind-eroded sediment on crops and integrating bio-drainage measures to improve water infiltration.	N, S
7	Introducing indigenous and palatable grass seeds into degraded rangelands.	N, S
8	Introducing rotational grazing of livestock between pastures to assist with increasing field water absorption and decreasing water runoff.	N, S
9	Pasture management such as land-use planning and introducing improved management measures such as exclusion zones and rotational grazing of livestock.	N, S
10	Establishing joint forest management involving communities and local government.	N, S
11	Introducing intercropping and agroforestry, and in specific areas may include apiculture, i.e. beekeeping.	N, S
12	Introducing sustainable long-term community services such as renewable energy and energy-efficient stoves.	N, S
13	Setting up shelterbelts in areas frequently exposed to erosion.	S
14	Establishing commercial plantations making use of an array of indigenous fruit species in degraded lands.	S
15	Introducing organic mulching for farmers to use on croplands which promotes soil fertility as well as water-saving.	S
16	Diversifying crop use, including drought-tolerant and climate-resilient crops.	S
17	Establishing greenhouses for horticulture including local lemon, tomato and cucumber.	S
18	Establishing community woodlots in abandoned areas for fuelwood.	S
19	Providing additional and improving existing extension services provision which will include developing advisories for farmers.	S
20	Establishing on-farm water resource management.	S
21	Rehabilitating existing irrigation, drainage and pumping systems.	S

EbA measures listed in Table 7 above have been identified as priority interventions in the northern and southern sub-basins of the KRB, as indicated. Final selection of activities in each watershed will be through the participatory development of WAPs (Activity 2.2.2). Communities will select the most appropriate interventions for their watersheds through the WAP development process. It is expected that all activities mentioned in Table 7 above will be implemented; however, a right combination of measures will be determined and appropriately customized for each local sub-watershed through local engagement and community participation. The measures will also be scrutinized as part of the project ESMP process.

Project activities where plant introduction/management is an aspect will follow the guidelines outlined below.

- **Expert input.** Experts (ecological, hydrological and agricultural) will be appointed to provide input into the selection and development of protocols for each of the EbA interventions, particularly where plant-introduction/management is an aspect.
- **Site selection.** As part of the participatory mapping process, expert input (ecological, hydrological and agricultural) will inform the selection of sites for EbA interventions. For example, it is envisaged that existing woodlots will be supplemented; newly-planted woodlots will be situated in appropriate, low-risk areas (a safe distance from areas of high conservation value or biodiversity hotspots).
- **Species selection.** Wherever possible, naturally-occurring species will be planted. Where necessary, non-invasive, non-naturally-occurring species will be planted. Known invasive species or species with potentially invasive traits will be avoided. Where alien species will be introduced, the Committee for Environmental Protection (CEP) will be consulted prior to such introduction to ensure that these species do not pose a risk to endemic biodiversity.
- **Operational monitoring and management.** Regular monitoring by the appointed regional/local ecologist/s will be undertaken to ensure early detection and rapid response to any species emerging as potentially invasive. An appropriate invasive species eradication plan will be developed and implemented according to stipulated timeframes.

Activity 2.1.3. Conduct farmer field schools (FFs) in target villages making use of demonstration plots.

The strengthened training programmes under Activity 1.4.2 will inform the development of a curriculum for farmer field schools (FFSs). These FFSs will be conducted in the target villages of Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon Districts and will include training on EbA, CSA and SLM. Specifically, trainings will demonstrate the importance of improved livestock husbandry and community-based rangeland practices. FFSs will be advertised through the activities under Outcome 3. Through the provision of FFSs, local community capacities will be built with specific wide-spread knowledge of EbA, CSA and SLM.

Training of *jamoat*-level extension service providers will be focused on within the FFSs. By including these local experts in the FFSs, the project will promote farmer interaction whereby both government and communities learn from previous experiences. This will allow upstream versus downstream experiences to be shared as well as the development of possible measures that will benefit each other in the future. Through the establishment of demonstration plots [under Activity 2.1.2], training by community members to fellow community members will take place. This will facilitate a training-of-trainers (ToT) approach which further promotes sustainability of project interventions. Community leaders will be selected to take part in the training and sharing of experiences.

Curricula of the FFSs will include training on avoiding soil erosion threats at the community level. This training will be tailored to: i) increase infiltration of rainwater into topsoils; ii) increase the water-retention capacity of soils; and iii) restore soil horizons in landscapes with sheet/gully erosion. Such management of soils will be underpinned by increasing the vegetative cover of the landscape and the organic matter content of the soil. To this end, a wide range of land management techniques will be presented for implementation to improve SLM in target villages. Such management interventions and techniques are separated according to the northern and southern sub-basin of the KRB. The specific EbA measures proposed for the northern and southern sub-basins are outlined in [Table 7](#) above.

The proposed techniques outlined above will include EbA practices, which are usually a form of CSA and/or SLM. EbA is currently not being undertaken by local communities because of limited technical capacity to plan, implement and sustainably finance the interventions. Under this activity, this technical capacity will be enhanced at the village level. In

addition, Outcome 1 will contribute to building the capacity by strengthening local extension services and village governance structures. FFS will be inclusive, and it is expected that participants will be at least 30% women.

Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities.

Under this output, climate risk information will inform the development of fine-scale Watershed Action Plans (WAPs). These WAPs will assist local government and communities in ensuring that all identified EbA measures are carried out in an efficient and effective manner. The WAPs will include detailed budgets that will assist in determining the extent to which EbA measures can be implemented.

WAPs will be developed through a participatory process with communities from target villages in Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon Districts. Such participatory processes will be conducted by holding regular consultation meetings in the villages with local government, PUUs and other relevant organisations. Through this output, the appropriate EbA measures in each watershed will also be shortlisted for future implementation.

Indicative activities to be implemented under Output 2.2 are detailed below.

Activity 2.2.1. Conduct participatory mapping at the watershed level.

All mapping will be conducted in a thorough participatory manner with local communities and community-based organisations (CBOs). These CBOs are likely to include forestry organisations and Pasture User Unions (PUUs). Experts undertaking the mapping will be required to consult with local communities, learning from their on-the-ground experiences in the region. Communities will also be part of the final decision-making process for the shortlisting of EbA interventions [under Activity 2.2.2]. The meetings will be to consult with communities on their knowledge of watershed mapping, as well as to inform, update and make decisions for the future planning.

PUUs are currently in place in certain regions of the country. These PUUs have been established through previous and ongoing projects. Further development of existing associations, as well as the establishment of new PUUs, will be supported under this activity by conducting participatory mapping of each target watershed in the KRB. The mapping will make use of ecological, hydrological and agricultural data as well as regional and local experts to determine the most appropriate EbA measures to be implemented at the watershed level to improve community resilience.

These ecological, hydrological and agricultural experts will also assist with determining the most appropriate land-use management changes necessary to address the climate change threats in the villages' surrounding landscapes. The recommendations will take into account the integrated catchment approach of the project, based on the strategy developed under Output 1.3.

Activity 2.2.2. Develop Watershed Action Plans (WAPs) for vulnerable watersheds in the Kofirnighan River Basin.

Results of the participatory mapping conducted at the watershed level [Activity 2.2.1] will inform the selection of a wide range of EbA measures for each targeted watershed. These interventions will be assessed to form a shortlist that will be used for implementation recommendations going forward.

The land-use plans informed by these recommendations will be treated as working documents, primarily because of the: i) participatory nature of the mapping; ii) selection of shortlisted EbA interventions; and iii) monitoring to be conducted of implementation interventions. These working documents are flexible in nature in that they can be changed in an iterative manner as more relevant and up-to-date information becomes available. Importantly, these WAPs will be carefully aligned with the integrated catchment management strategy developed under Outcome 1 [under Output 1.3]. WAP development will be facilitated by district representatives from CEP and *jamoat*-level government in a participatory process with local communities living in the watersheds.

These WAPs will outline what types of EbA interventions will be implemented in which areas, propose sustainable rates of extraction for local ecosystems, and identify the types of protection measures that need to be undertaken. This will ensure that the plans will be responsive to local needs, while also building local community ownership of WAPs. Through the

participatory development of WAPs, local community members will gain an increased understanding of climate risks, DRR and the importance of sustainably managing watersheds.

Output 2.3. EbA interventions implemented in target watersheds by local communities.

Under Output 2.3, local communities will be supported in implementing EbA interventions identified in Output 2.2. These interventions will reduce climate risks in two ways. Firstly, interventions such as reforestation, agroforestry and sustainable pasture management in degraded watersheds will strengthen the provision of ecosystem services. These ecosystem services include increased groundwater recharge and soil stabilisation, which will reduce the downstream impacts of flooding, landslides, soil erosion and limited water availability. Secondly, project activities will include protection interventions downstream. These interventions will include river bank stabilisation and flood protection.

The sustainability of watershed rehabilitation activities will be ensured by promoting local community livelihoods that are decoupled from unsustainable natural resource extraction. This will be done by using economically valuable species such as fruit and nut trees for watershed reforestation wherever possible. Reforestation activities will also be guided by existing Forest Development Plans. In addition, the environmental sustainability of local community livelihoods will be increased through the implementation of sustainable livelihood alternatives. Such alternatives will include low energy cookstoves, as well as harvesting fuelwood and timber species from local community woodlots.

The implementation of sustainable livelihoods will increase the environmental sustainability of local communities by providing these communities with sources of supplemental income that is decoupled from environmental degradation. For example, community woodlots will provide local communities with access to fuelwood and timber from suitable fast-growing species that will reduce their reliance on sourcing fuelwood from nearby forests. Woodlots will also be situated nearby beneficiary communities to reduce the labour burden of collecting fuelwood. Improved management practices from agricultural and pasture lands will reduce environmental degradation from overgrazing and soil degradation while also increasing local biodiversity.

Activity 2.3.1. Support local communities to implement priority EbA interventions.

Under this activity, local community members in ~100 villages across 14 *jamoats* in the six target districts will be supported in implementing the priority EbA interventions demonstrated in Output 2.2. Community member support will be gender inclusive and it is intended that at least 40% of recipients will be women. Communities will be provided with technical assistance and inputs for implementing risk-reduction activities such as watershed reforestation, erosion control measures and flood reduction measures. Additionally, inputs will be provided for measures that increase energy efficiency and consequently reduce unsustainable practices (such as low-energy cook stoves).

Nurseries will be established in each of the 14 *jamoats* to provide local community members with suitable climate-resilient species for watershed reforestation, agroforestry and intercropping. Economically useful species such as fruit trees or high-value timber trees for woodlots will be prioritised and species selection will be informed by local conditions as well as community needs.

Selection of the EbA interventions will be informed by an assessment of their social, environmental and economic impacts within a community. Local communities will be consulted to agree on which EbA interventions should be implemented in the different land categories. The proposed EbA interventions that will be assessed for selection on the shortlist have been listed under Output 2.1 [specifically under Activity 2.1.3] and a more detailed list is provided in Annex 9. This list also includes details on the expected cost-effectiveness of each intervention. While it is expected that all activities that have been listed will be implemented, each local community will have the opportunity to provide input into the selection of locally-appropriate activities. Consequently, some activities may not be implemented as a result of local preferences. Additional community consultations will be undertaken during the insipient phase, in the first year of project implementation to allow communities to provide their inputs into the final verification of these interventions. The consultations will be inclusive and conducted using locally-appropriate methods for community engagement.

Activity 2.3.2. Support local community members in developing Enterprise Plans (EPs) based on EbA interventions.

Under this activity, local communities will be supported in developing EPs. The activity will encourage women involvement, with at least 40% of participants being women. Local community members will receive training on enterprise

development and be educated on the economic viability of ecologically-sound natural resource-based businesses. By demonstrating the economic viability of EbA interventions for watershed restoration to local communities, this activity will contribute towards the sustainability and scalability of project interventions.

Local community members will be trained on how to start and maintain enterprises based on EbA interventions. Training will include cash flow prediction, product processing and accessing suitable markets.

Activity 2.3.3. Monitor the impacts of EbA interventions.

Continuous monitoring will be done at the community-level to provide an evidence-base on the effectiveness of EbA interventions and to enable adaptive management to take place. Community monitoring plans will be developed to enable continuous monitoring of WAPs [developed in Activity 2.2.2]. Local community members will monitor the impacts of EbA interventions and other actions implemented under WAPs. Authority figures in the local communities will be trained on interpreting monitoring information and taking adaptive management decisions based on the available information. Women will be encouraged to participate in these aspects of monitoring and adaptive management decision-making. Existing local-level gender dynamics will be taken into account to ensure that involvement in these activities does not place an additional labour burden on women and men. In addition, monitoring information will be shared with *jamoat*-level government officials and extension service providers, who will use this information to inform their decision-making at *jamoat* level.

Monitoring is likely to include the extent of damages from climate-related disasters, such as floods and landslides. In addition, the reliance of local community members on unsustainable practices will also be monitored. Indicators will be identified in community monitoring plans but are likely to include the amount of fuelwood harvested from natural forests.

Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin.

The activities of the proposed project have significant upscaling potential throughout Tajikistan and in Central Asia. Other countries in the region face similar climate change risks and are likely to benefit from adopting an integrated catchment management approach using EbA. Consequently, lessons learned from this project will provide an evidence-base to both inform and promote project activities beyond the project's geographical scope. To ensure that lessons learned are adequately collected, collated and disseminated, this component will focus on strengthening knowledge management around integrated catchment management and EbA in Tajikistan.

Outcome 3. Existing knowledge management platforms supported for integrated catchment management and EbA.

A number of projects to address climate change impacts have been implemented at a village level across Tajikistan in the past decade. Many of these projects have had considerable success in terms of reducing soil erosion, raising finance for EbA interventions and increasing crop and livestock productivity. Consequently, numerous lessons have been learned for climate change adaptation activities in the country. These lessons include:

- establishing governance structures, from a national to village scale, to support EbA interventions;
- methods for engaging local communities;
- mechanisms for sharing lessons and best practices between villages;
- methods to undertake applied research in a participatory community approach;
- use of technology, such as smartphone applications, for training on and monitoring of interventions; and
- incentives²²³ required to ensure long-term implementation and maintenance of EbA interventions by local communities.

The lessons listed above have, to date, not been collated, analysed and shared. They remain dissipated across projects and are consequently often viewed as unreliable because their underlying data is not available for public viewing. Under this

²²³ e.g. financial, environment, cultural and aesthetic

outcome, activities will support existing knowledge management platforms and hubs to facilitate the exchange of lessons learned across Tajikistan. By providing much-needed support to these platforms, information will be readily accessible and available for dissemination to different organisation levels, including national government ministries to the villages. This method will ensure that local knowledge sharing continues beyond the project lifespan and also raises awareness of the benefits of EbA for integrated catchment management in the country. The evidence base assembled under this outcome will ultimately be used by policy-makers for informing the revision of legislation, policies and strategies relevant to upscaling EbA across Tajikistan.

There are three outputs to achieve the above-described outcome. These outputs are interlinked through the respective activities to ensure the necessary support is provided to knowledge sharing platforms to facilitate information transfer. The three outputs and their indicative activities are detailed below, highlighting the linkages between the three project outcomes.

Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.

Currently, several knowledge management platforms and hubs exist within Tajikistan as a result of previous and ongoing development projects. Because of this, a network already exists for the housing, viewing and transfer of new information. Such institutions include the University of Central Asia (UCA) and the Open Centre under the Department of Geology (DoG). These institutions are mandated with the responsibility of collating, analysing and disseminating information on climate risks and suitable adaptation options. By providing support through gender-disaggregated training and information transfer, this output will promote the sustainability of these platforms.

Indicative activities to be implemented under Output 3.1 are outlined below.

Activity 3.1.1. Support existing knowledge management platforms responsible for collating, analysing and disseminating information on climate risks and suitable adaptation options.

The existing knowledge management platform that has been identified for facilitation and support through Output 3.1 is the Open Centre under the DoG. As a reputable academic institution, the UCA will also be supported considering its goal and mandate to expand to rural regions of Tajikistan and other Central Asian countries. Through supporting these two institutions, awareness raising activities will be promoted on climate risks and the benefits of integrating EbA into landscape management.

In order to effectively provide support to the platforms, all new information to be provided will be screened to ensure it is scientifically sound. An emphasis will be placed on information underpinned by credible scientific analysis methods. Anecdotal information will also be made available with, however, the caveat that further research is needed to determine its accuracy.

Activity 3.1.2. Collect and collate data and information from automated weather stations, agro-ecological extension centres and international publications..

Further to the data generated by automated weather stations (Outcome 1), additional data and information from *inter alia* local extension centres and from international publications will be collected and collated. This collated data and information will be made available to the supported information centres and participating local community members. While the Open Centre will provide a repository of information, to be disseminated to local communities, national decision-makers and academics, UCA will facilitate active sharing and training of the information (Activity 3.1.1.).

Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.

To increase the quality of information available on the platform(s), Output 3.2 will include the development of an impact evaluation framework. This framework will be used for assessing EbA interventions implemented through the project, the sites selected for EP implementation, and also those villages that have had or are adjacent to areas where prior EbA interventions have been successful. Given that EbA benefits materialise fully over decades, the framework will need to be

used by stakeholders during as well as after the completion of the project. A long-term research approach will consequently underpin the design of the framework.

Indicative activities to be implemented under Output 3.2 are detailed below.

Activity 3.2.1. Establish an impact evaluation framework to enable the effective quantification of project benefits and to provide information for future planning and implementation of EbA interventions.

An impact evaluation framework will be developed to monitor the impacts of project interventions. This framework will include the use of semi-randomised trials in areas with and without project interventions. In so doing, the framework will enable the effective attribution and quantification of project benefits and provide information for the future planning and implementation of EbA interventions across the country.

Activity 3.2.2. Obtain data and information through applying the framework will be disseminated via the knowledge platform(s).

The data and information obtained through applying the framework will be disseminated via the communication channels of the supported knowledge platform(s).

B. Economic, social and environmental benefits

Climate variability is already reducing agricultural productivity which is directly impacting food security in Tajikistan. This situation is likely to be exacerbated by predicted climate change-induced increases in extreme climate events. These events include floods, landslides and drought. The design of the proposed project is intended to provide adaptation alternatives for vulnerable Tajik communities to improve their resilience to climate change.

Activities and outputs of the project will have several economic, social and environmental benefits which will contribute to furthering sustainable development within Tajikistan. Activities have been designed to address the barriers identified as hindering climate change adaptation (CCA) in the country, namely: i) limited capacity of institutions to include CCA into national plans; ii) limited technical capacity of public services to implement activities among communities for CCA; and iii) limited knowledge sharing on CCA in Tajikistan.

The primary, overarching benefit of the project will be a reduction in climate risks. In doing so, environmental, social and economic damages as a result of climate change will be minimised among rural Tajik communities. This benefit will be realised by: i) reducing the exposure of vulnerable communities in the KRB to climate hazards; and ii) increasing the resilience of KRB communities and ecosystems to the impacts of climate hazards. To optimise sustainable development co-benefits, project interventions aimed at building climate resilience will use an EbA approach.

Implementing EbA in agricultural systems^{224,225} has been proven to improve the ability of crops and livestock to adapt to climate change and variability. These practices can be implemented at various scales to improve land-use management. For example, on-farm management of genetic biodiversity can ensure a broader source of crop resistance-capacity to uncertain occurrences and effects of extreme climate events. Genetic biodiversity is promoted through the diversification of crop varieties or inclusion of wild relatives. Other farm-level practices include the use of: i) integrated pest management strategies; ii) new cropping systems to reduce the impacts of pests and diseases; iii) the planting of windbreaks; and iv) the planting of agroforestry systems or cover crops to help reduce the evapotranspiration effect. At the landscape level, EbA helps regulate water and nutrient cycling by ensuring tree cover or natural vegetation in areas of hydrological importance. EbA also reduces the incidence or severity of crop pest and disease outbreaks related to extreme climate events. This is because enhancing the structural complexity of the agricultural landscapes through diverse cropping systems or inclusion of natural vegetation and on-farm tree cover promotes pest regulation.

²²⁴ Ecosystem-based Adaptation (EbA) is defined as in agricultural systems as the implementation of agricultural management practices that use or take advantage of biodiversity, ecosystem services or ecological processes (either at the plot, farm or landscape level) to help increase the ability of crops or livestock to adapt to climate variability. In contrast, practices that substitute the role of biodiversity in providing ecosystem functions and services for agricultural production such as excessive use of inorganic fertilizers or pesticides is not ecosystem-based.

²²⁵ Vignola R, Harvey CA, Bautista-Solis P, Avelino J, Rapidel B, Donatti C & Martinez R. 2015. Ecosystem-based adaptation for smallholder farmers: Definitions, opportunities and constraints. *Agriculture, Ecosystems and Environment* 211:126–132.

EbA practices benefit smallholders in multiple ways beyond helping them adapt to climate change. For example, they help ensure the continued provision of ecosystem services on which farming depends such as water provision, food provision, nutrient regulation, pest control and pollination. This contrasts with other non-EbA adaptation measures, such as excessive use of agro-chemicals. Such adaptation measures can yield adaptation benefits but may negatively impact the provision of ecosystem services, whilst having additional negative environmental off-site effects including the loss of biodiversity or contamination of streams. In addition, the use of EbA practices can help diversify production systems and sources of income generation, providing more stability to smallholder farmers. For example, the use of intercropping and agroforestry in production systems can diversify farmer revenue. This revenue is generated by providing timber, fruits, fuelwood and building materials that farmers can use for additional income, especially in years when income from the main cash crop is reduced. These additional products reduce farmer vulnerability to market changes as well as their dependence on outside products which improves farmer food security both directly and indirectly. The use of agroforestry practices can also make significant contributions to biodiversity conservation efforts. In addition, many EbA practices can help mitigate climate change by either reducing the amount of GHGs emitted from agricultural systems²²⁶, or by increasing the overall farm biomass²²⁷.

Environmental, social and economic benefits of the proposed project that will accrue to rural Tajik citizens are listed in Table 8. Brief description of each set of benefits follow.

Environmental benefits

EbA interventions increase the functionality of ecosystems and strengthen the provision of ecosystem goods and services. Environmental benefits that will be generated during the project are listed in Table 8 below and it is expected that these benefits will be generated during the proposed project and will remain beyond the project lifetime. This is because ecosystems, once established, tend to require less maintenance than hard infrastructure. In particular, it is expected that, as project practices are upscaled and replicated in the future, environmental benefits will be spread throughout the KRB.

Social benefits

A number of social benefits are detailed in Table 8 below. These benefits will accrue to rural Tajik citizens during and after project implementation. The main social benefits will be achieved through a reduction in the exposure of rural Tajik citizens to increasing climate risks through the restoration of vulnerable watersheds. Additionally, project activities are expected to particularly benefit women. Many of the activities of the project will generate benefits that will accrue to women, in particular. For instance, the sustainable harvesting of fuelwood from conveniently located woodlots is expected to reduce the time allocation of women for collecting fuel. Combined with energy-efficient cookstoves, this activity will largely improve the lives of rural Tajik women by reducing their labour. Other activities that generate supplemental incomes, such as apiculture, will be targeted specifically at women. In addition to promoting women-led small enterprises, the AF project will specifically target women for educational activities on climate change adaptation.

Economic Benefits

The project will generate two types of economic benefits: i) reduced losses from the impacts of climate change; and ii) gains in marginal utility as a result of project interventions. Marginal utility gains are expected as a result of the introduction of practices that: i) generate or increase income; and ii) reduce the labour burden of vulnerable communities. Project activities will provide opportunities for rural Tajik citizens to generate or increase income from agricultural activities, as shown in Table 8 below. However, some project interventions (such as the introduction of cookstoves or the planting of woodlots) are also predicted to reduce the labour burden of local community members.

Most of the economic benefits are expected to persist beyond the project lifetime. However, any employment of local community members in project activities is expected to cease after project closure. Where vulnerable community members are employed in project activities, these community members will be trained to ensure that they will be capable of establishing and maintaining natural resource-based enterprises. This will provide community members with a sustainable source of income beyond the project lifetime.

²²⁶ e.g. by reducing the use of inorganic fertilisers, agrochemicals, machinery and associated emissions

²²⁷ e.g. by increasing soil carbon stocks or above-ground biomass

Table 8 illustrates the social, economic and environmental benefits associated with the EbA interventions to be implemented through the proposed project.

Table 8. Specific expected social, economic and environmental impacts and benefits per outcome of the proposed project under two scenarios: a) without the project (baseline); and b) with the project (additionality).

Outcome	a) Without the project (baseline)		
	Environmental impacts	Social impacts	Economic impacts
1. Catchment management strategy to manage climate risks operationalised at Raion (district) and jamoat (sub-district) levels in Kofirnighan River Basin (KRB).	<ul style="list-style-type: none"> Continued climate-change induced degradation of the KRB catchment 	<ul style="list-style-type: none"> No beneficial changes in awareness, technical capacity or gender equality 	<ul style="list-style-type: none"> Increased economic losses expected as a result of climate-change induced catchment degradation and the loss of ecosystem goods and services
2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	Failure to construct gabions <ul style="list-style-type: none"> Existing environmental problems exacerbated by climate change impacts 	<ul style="list-style-type: none"> Reduced production area, land productivity and crop yield 	<ul style="list-style-type: none"> Increased economic losses as a result of increasing agricultural inputs and production costs
	Failure to implement stone lines and contour bunds <ul style="list-style-type: none"> Existing environmental problems exacerbated by climate change impacts (increased runoff, soil loss, downstream siltation, downstream flooding and reduced water infiltration, soil moisture, soil organic matter, above-ground biomass) 	<ul style="list-style-type: none"> Reduced production area, land productivity and crop yield 	<ul style="list-style-type: none"> Increased economic losses as a result of increasing agricultural inputs and production costs
	Failure to implement water-saving irrigation techniques <ul style="list-style-type: none"> Existing environmental problems exacerbated by climate change impacts 	<ul style="list-style-type: none"> Increased water consumption and decline in crop yield 	<ul style="list-style-type: none"> Increased economic losses as a result of drought-related crop losses, increased agricultural inputs and production costs
	Failure to diversify crops and use drought-resilient crops <ul style="list-style-type: none"> Limited biodiversity conservation (of genetic resources) Crops poorly-adapted to climate change conditions Horticulture in greenhouses <ul style="list-style-type: none"> Decreased intensity of cultivation through un-consolidated production area under the BAU scenario 	<ul style="list-style-type: none"> Limited diversity of production within farms Reduced nutrition for local community, negatively affecting community health and increasing the burden on women who are traditionally the primary care-givers within rural households Reduced crop yield Increased crop susceptibility to pests 	<ul style="list-style-type: none"> Increased economic losses as a result of climate change-related crop losses
	Failure to establish intercropping, agroforestry and woodlots <ul style="list-style-type: none"> Increased pressure on natural forests Crops and livestock exposed to extreme climate conditions Existing environmental problems exacerbated by climate change impacts 	<ul style="list-style-type: none"> Limited diversity of production on and off-farm, reducing the opportunities to promote the involvement of rural women e.g. apiculture Reduced provision of food and fodder, increasing the labour burden on rural women in particular who are traditionally responsible for the collection of fuelwood. Reduced nutrition for local community, negatively affecting community. 	<ul style="list-style-type: none"> Increased economic losses as a result of climate change-related crop losses Reduced capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the increased labour burden
	Failure to rehabilitate/restore	<ul style="list-style-type: none"> Decreased nonmaterial 	<ul style="list-style-type: none"> Increased loss of trees to

Outcome	a) Without the project (baseline)		
	Environmental impacts	Social impacts	Economic impacts
	degraded forest ecosystems <ul style="list-style-type: none"> Increased biodiversity loss Crops and livestock exposed to extreme climate conditions Existing environmental problems exacerbated by climate change impacts 	benefits (e.g. scenic resources, recreation, science and education, spiritual and religious) derived from loss of conservation value of landscape	drought or dry spells <ul style="list-style-type: none"> Reduced ecosystem services such as tourism (e.g. hiking) and recreation
	Failure to implement sustainable harvesting from ‘healthy’ forest ecosystems <ul style="list-style-type: none"> Crops and livestock exposed to extreme climate conditions Increased biodiversity loss Existing environmental problems exacerbated by climate change impacts 	<ul style="list-style-type: none"> Reduced provision of food and fodder Reduced nutrition for local community, negatively affecting community health and increasing the burden on women 	<ul style="list-style-type: none"> Increased economic losses
	Failure to establish and maintain livestock exclusion zones <ul style="list-style-type: none"> Decreased above-ground biomass Increased biodiversity loss Existing environmental problems exacerbated by climate change impacts 	<ul style="list-style-type: none"> Decreased nonmaterial benefits derived from loss of conservation value of landscape 	<ul style="list-style-type: none"> Decreased ecosystem services such as tourism (e.g. trekking) and recreation
	Failure to sow palatable and indigenous grass seeds in degraded rangelands and introduce rotational grazing <ul style="list-style-type: none"> Decreased above-ground biomass Decreased biodiversity conservation Existing environmental problems exacerbated by climate change impacts 	<ul style="list-style-type: none"> Reduced pasture productivity and carrying capacity 	<ul style="list-style-type: none"> Decreased farm income through decreased carrying capacity
	Failure to convert to energy efficient technologies and practices <ul style="list-style-type: none"> Unsustainable practices would persist e.g. using unsustainably harvested fuelwood for cooking using open fires 	<ul style="list-style-type: none"> Increased labour burden on rural women who would need to cover increasingly large distances to harvest fuelwood for cooking 	<ul style="list-style-type: none"> Reduced capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the increased labour burden
3. Existing knowledge management platforms supported for integrated catchment management and EbA.	<ul style="list-style-type: none"> Insufficient information on EbA would be available to local communities, resulting in little/no implementation of EbA and the persistence extreme vulnerability to climate change Local communities would likely fail to engage in developing and implementing adaptation approaches to local problems i.e. low soil fertility resulting from soil erosion. 	<ul style="list-style-type: none"> Failing to adopt adaptation technologies would increasingly expose community livelihoods to the worsening impacts of climate change Current limited levels of knowledge of climate change adaptation would persist 	<ul style="list-style-type: none"> Microfinance for community-led small-scale projects focusing on community-based adaptation would likely remain inaccessible

Outcome	b) With the project (additionality)		
	Environmental benefits	Social benefits	Economic benefits
1. Catchment management strategy to manage climate risks operationalised at Raion (district) and jamoat (sub-district) levels in Kofirnighan River Basin (KRB).	<ul style="list-style-type: none"> Enhanced catchment integrity through better protection 	<ul style="list-style-type: none"> Increased awareness and technical capacity of policymakers and government institutions regarding climate-resilient adaptation technologies Increased capacity of professionals to present climate change adaptation information Increased gender equality at a local and national level – 30% of participants involved will be women 	<ul style="list-style-type: none"> Increased profit margins will be realised in the long-term as a result of training provided on climate change adaptation technologies and integrated catchment management

Outcome	b) With the project (additionality)		
	Environmental benefits	Social benefits	Economic benefits
2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	Construction of gabions <ul style="list-style-type: none"> Reduced slope instability and risk of minor mudslides and landslides Slowed water runoff, increased water infiltration and soil moisture Reduced soil loss (particularly through reduced gully erosion) Increased soil organic matter Increased above-ground biomass Off-site benefits: <ul style="list-style-type: none"> reduced downstream siltation reduced downstream flooding increased groundwater and river water quality 	<ul style="list-style-type: none"> Increased production area Increased land productivity and crop yield 	<ul style="list-style-type: none"> Increased farm income Reduced loss of crops and land caused by slope instability
	Stone lines and contour bunds <ul style="list-style-type: none"> Slowed water runoff, increased water infiltration and soil moisture Reduced soil loss (particularly through reduced sheet erosion) Increased soil organic matter Increased above-ground biomass Off-site benefits 	<ul style="list-style-type: none"> Increased production area Increased land productivity and crop yield 	<ul style="list-style-type: none"> Reduced agricultural inputs and thus production costs Increased farm income
	Water-saving irrigation techniques <ul style="list-style-type: none"> Reduced evaporation of soil moisture Increased water infiltration and soil moisture Delivered constant moisture to root zone (reduced drought-stress) Reduced soil loss (particularly through reduced rain-splash erosion caused by overhead irrigation) Increased above-ground biomass of crops, reduces above-ground biomass of weeds Reduced plant pathogens e.g. fungus 	<ul style="list-style-type: none"> Reduced water consumption Increased crop yield 	<ul style="list-style-type: none"> Reduced agricultural inputs and thus production costs Increased farm income Reduced loss of crops to drought or dry spells
	Diversification of crops and use of drought-resilient crops <ul style="list-style-type: none"> Increased biodiversity conservation (of genetic resources) Horticulture in greenhouses <ul style="list-style-type: none"> Increases intensity of cultivation through consolidation of production area 	<ul style="list-style-type: none"> Increased diversity of production within farms Increased nutrition for local community, improving community health Increased crop yield Reduced crop susceptibility to pests 	<ul style="list-style-type: none"> Increased farm income Reduced risk of economic failure due to diversification of production
	Intercropping, agroforestry and woodlots <ul style="list-style-type: none"> Reduced pressure on natural forests Protected crops and livestock from extreme climatic conditions Increased biodiversity conservation Reduced slope instability and risk of minor mudslides and landslides Slowed water runoff Increased soil moisture Reduced soil loss (through reduced sheet and gully erosion) Increased soil organic matter Increased above-ground biomass Increased climate regulation and carbon sequestration Off-site benefits: 	<ul style="list-style-type: none"> Increased diversity of production on and off-farm, with increased opportunities to promote the involvement of rural women e.g. apiculture Increased provision of food and fodder. Increased nutrition for the local community, improving community health Increased provision of fuelwood and timber, reducing the burden on rural women in particular who are traditionally responsible for the collection of fuelwood 	<ul style="list-style-type: none"> Increased farm income Reduced risk of economic failure in response to diversification of production Increased capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the reduced labour burden

Outcome	b) With the project (additionality)		
	Environmental benefits	Social benefits	Economic benefits
	Rehabilitation/restoration of degraded forest ecosystems <ul style="list-style-type: none"> • Increased biodiversity conservation • Increased water infiltration • Increased above-ground biomass (increased plant survival) • Protected crops and livestock from extreme climatic conditions • Reduced slope instability and risk of minor mudslides and landslides • Slowed water runoff • Increased soil moisture • Reduced soil loss (through reduced sheet and gully erosion) • Increased soil organic matter • Increased climate regulation and carbon sequestration • Off-site benefits 	<ul style="list-style-type: none"> • Increased nonmaterial benefits (e.g. scenic resources, recreation, science and education, spiritual and religious) derived from increased conservation value of landscape 	<ul style="list-style-type: none"> • Reduced inputs and thus production costs • Increased farm income • Reduced loss of trees to drought or dry spells • Increased ecosystem services such as tourism (e.g. hiking) and recreation
	Sustainable harvesting from 'healthy' forest ecosystems <ul style="list-style-type: none"> • Protected crops and livestock from extreme climatic conditions • Increased biodiversity conservation • Reduced slope instability and risk of minor mudslides and landslides • Increased soil moisture • Reduced soil loss • Increased soil organic matter • Increased above-ground biomass • Increased climate regulation and carbon sequestration • Off-site benefits 	<ul style="list-style-type: none"> • Increased provision of food and fodder • Increased nutrition for the local community, improving community health and reducing the burden on women who are traditionally the primary care-givers within rural households 	<ul style="list-style-type: none"> • Increased farm income • Increased capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the reduced labour and care-giver burden
	Livestock exclusion zones <ul style="list-style-type: none"> • Increased above-ground biomass • Increased biodiversity conservation • Slowed water runoff • Increased soil moisture • Reduced soil loss (particularly through reduced sheet erosion) • Increased soil organic matter • Increased climate regulation and carbon sequestration • Off-site benefits 	<ul style="list-style-type: none"> • Increased nonmaterial benefits (e.g. scenic resources, recreation, science and education, spiritual and religious) derived from increased conservation value of landscape 	<ul style="list-style-type: none"> • Increased ecosystem services such as tourism (e.g. trekking) and recreation
	Sowing of palatable and indigenous grass seeds in degraded rangelands and introducing rotational grazing <ul style="list-style-type: none"> • Increased above-ground biomass • Increased biodiversity conservation • Slowed water runoff • Increased soil moisture • Reduced soil loss • Increased soil organic matter • Increased climate regulation and carbon sequestration • Off-site benefits 	<ul style="list-style-type: none"> • Increased pasture productivity and carrying capacity 	<ul style="list-style-type: none"> • Increased income from livestock
	Conversion to energy efficient technologies and practices	<ul style="list-style-type: none"> • Reduced labour burden on rural women as a result of improved fuel 	<ul style="list-style-type: none"> • Increased capacity of rural women in particular

Outcome	b) With the project (additionality)		
	Environmental benefits	Social benefits	Economic benefits
	<ul style="list-style-type: none"> Increased energy-efficiency of practices e.g. using low-energy cookstove Reduced pressure on forests 	efficiency	to pursue and maintain alternative livelihoods as a result of the reduced labour burden
3. Existing knowledge management platforms supported for integrated catchment management and EbA.	<ul style="list-style-type: none"> Involving communities in developing the approaches allows more flexible adaptation efforts, i.e. catering specifically for reduced soil nutrients through soil erosion etc. 	<ul style="list-style-type: none"> Improved livelihoods through adoption of climate-resilient adaptation technologies and innovative climate information technologies within and surrounding vulnerable communities Increased knowledge through training provided to relevant local-level government and NGO officials Increased community-uplift in response to developing their own project proposals for on-the-ground implementation within their communities 	

C. Cost-effectiveness

Alternatives to the baseline context in Tajikistan include the null alternative, the traditional alternative and the proposed alternative. These three scenarios are presented below.

Scenario 1. ‘Do nothing’ approach

The first scenario assumes that no interventions will be implemented. This means that the baseline scenario will remain, and the negative impacts of climate change will continue to cause significant losses to the economy. Climate change impacts such as rising temperatures and increases in intense rainfall events will be exacerbated by business-as-usual practices. Rural Tajik communities will continue to lack the required technical capacity to climate-proof their livelihoods and will continue to be impacted disproportionately by the negative impacts of climate change. Predicted declines in the agricultural yield under climate change conditions will further reduce the food security in the country, while an increasing number of climate change migrants will be exposed to hydrometeorological risks.

Scenario 2. Use of a non-EbA approach

Traditional approaches to managing the impacts of climate change may include engineered structures that protect infrastructure, agricultural fields and communities from floods and landslides. Such approaches may also result in an increase of agricultural inputs to offset a loss in soil productivity. These types of approaches are likely to yield adaptation benefits to local communities but have a number of undesirable shortfalls. Firstly, traditional approaches generally do not generate significant co-benefits. These approaches are inflexible in that each intervention generally only serves one purpose. Secondly, traditional approaches are frequently technology-oriented and require technical capacity to implement and maintain. This capacity is often lacking among local communities in Tajikistan. As a result, hard infrastructure such as flood protection dams are frequently not sustainable in the long term. Lastly, traditional approaches are frequently costly, with significant associated capital and operational costs. Neither the GoT or local communities currently have the financial capacity to construct and maintain technological solutions – particularly as maintenance costs are likely to increase with the increasing impacts of climate change.

Scenario 3. Integrated catchment management, including EbA solutions

Under this scenario, the target communities in Tajikistan will be introduced to EbA practices that include CSA and SLM interventions. Community members will be trained on how to adopt these EbA solutions to manage the landscape through an integrated cross-cutting strategy rather than by each sector. This integrated catchment management strategy will be focused on increasing the resilience of small-scale farmers and pastoralists in Tajikistan to the impacts of climate change. Such EbA interventions are inherently multi-use, providing several social, economic and environmental co-benefits. EbA interventions are also frequently cheaper and easier to maintain than their traditional counterparts. As a result, community members are more likely to continue maintaining EbA interventions in the long term.

Table 9. Qualitative indicators for the economic, environmental and social cost-effectiveness of the 3 scenarios

Indicator	Scenario 1	Scenario 2	Scenario 3
Economic	<ul style="list-style-type: none"> Expected increase in losses as a result of climate change 	<ul style="list-style-type: none"> Climate change losses are avoided/reduced High operations/ maintenance costs 	<ul style="list-style-type: none"> Climate change losses are avoided/reduced Low operations/ maintenance costs Economic benefits realised through increased agricultural production and alternative livelihood opportunities
Environmental	<ul style="list-style-type: none"> Increasing ecosystem degradation as a result of increased erosion, flooding and landslides Increasing reliance of local communities on unsustainable extraction of environmental goods such as fuelwood 	<ul style="list-style-type: none"> Increasing ecosystem degradation as a result of: i) increased fertiliser use; ii) implementation of hard infrastructure; and iii) climate change impacts 	<ul style="list-style-type: none"> Ecosystems are rehabilitated and maintained Communities are provided with livelihood opportunities that are decoupled from ecosystem degradation
Social	<ul style="list-style-type: none"> Loss in economic opportunities Impacts on particularly vulnerable groups – e.g. women 	<ul style="list-style-type: none"> Possible loss of private land for construction and resettlement resulting in negative social consequences 	<ul style="list-style-type: none"> Increase in economic opportunities Gender-responsive approach improves the livelihoods of rural Tajik women

Preferred solution

The preferred solution for the proposed project is Scenario 3, which encompasses an integrated approach to catchment management for vulnerable Tajik communities. Although Scenario 2 is a technically viable alternative, the preferred solution has been chosen because: i) EbA is likely to be cost-effective; and ii) EbA interventions are likely to be more sustainable than a traditional approach. The overall objective of the proposed project is cost-effective in that a proactive approach to climate-risk management will be promoted throughout Tajikistan. Climate impacts are predicted to cost the country more than US\$132 million annually by 2050. Preventative measures, such as climate-informed planning and development, will avoid some of these costs. Such a preventative approach to climate risks is more cost-effective than reactionary measures.

Project outputs will focus on improving catchment management, including landscape management and planning processes, in rural areas of Tajikistan. In so doing, the project will create an enabling environment for climate change adaptation to occur in vulnerable catchments. These processes are inherently replicable across the country, thereby strengthening the sustainability, reach and impact of the project objectives. The strengthened knowledge management provided through Outcome 3 will further promote adaptive management of EbA and climate risk management in Tajikistan. This will ensure that future activities in the country benefit from a strengthened local knowledge base for EbA and catchment management. Overall, the project will benefit at least 46,000 people living in ~100 villages in the 6 most vulnerable districts throughout the KRB. This represents ~5% of the total KRB population. This number is considered a conservative estimate, as many project activities are predicted to generate benefits for communities living downstream of project intervention sites. These communities could not be identified during the project development phase. In addition, improved catchment management practices are expected to indirectly benefit: i) the entire population of the 6 most vulnerable districts in the KRB (~828,000); and ii) the entire population of the KRB (~2.8 million).

At a local level, the project will promote the use of EbA interventions, which have been demonstrated to have favourable cost-benefit ratios while providing significant sustainable development co-benefits^{228,229}. For example, soil conservation measures have been shown to increase crop productivity by between 15–25%²³⁰. Project activities will support EbA interventions in target districts and sites²³¹, providing improved livelihoods and value addition for agricultural and pastoral

²²⁸ Jones HP, Hole DG & Zavaleta ES. 2012. Harnessing nature to help people adapt to climate change. *Nature Climate Change* 2:504–509.

²²⁹ UNEP/STREP. 2012. A comparative analysis of ecosystem-based adaptation and engineering options for Lami Town, Fiji: Synthesis Report.

²³⁰ Tesfaye A, Brouwer R, van der Zaag P & Negatu W. 2016. Assessing the costs and benefits of improved land management practices in three watershed areas in Ethiopia. *International Soil and Water Conservation Research* 4:20–29.

²³¹ Target sites will be identified during project inception.

products. This has been shown to be more cost-effective for increasing income and reducing poverty than support for other sectors²³². Introducing agrobiodiversity and ecosystem service improvement practices to smallholder farmers ensures that farm-based livelihoods will be resilient to climate change and variability²³³. During the project development phase, a cost-effectiveness analysis of proposed EbA activities was completed for both the northern and southern sub-basins of the KRB was conducted. All the proposed activities are associated with a positive Internal Rate of Return (from 10% to 50%). Benefit-to-cost ratios range from 3:1 to 12:1, and payback periods from 2 years to 8 years. The results of the analysis are displayed in Annex 9.

The cost-effectiveness of the project's on-the-ground adaptation interventions [under Outcome 2] will be greatly enhanced by the EbA approach. A growing scientific literature library highlights that EbA measures result in a greater ratio of cost-benefit compared to the implementation of hard infrastructure. For example, an economic analysis of the restoration and rehabilitation of degraded woodlands²³⁴ estimates internal rates of return of 20–60% and cost-benefit ratios of up to 35:1 for grasslands²³⁵. An example of the cost-effectiveness of EbA approaches also recently emerged from an economic analysis undertaken in Lami, Fiji²³⁶. This analysis included assessments of the costs and benefits of three approaches to watershed management, namely: i) EbA measures only; ii) hard infrastructure interventions only; and iii) a hybrid approach applying both EbA measures and hard infrastructure interventions. Results of the analysis demonstrated that EbA options for watershed management are at least twice as cost-effective as hard infrastructure engineering options – i.e. a cost-benefit ratio of US\$19.50:1 for EbA compared to US\$9:1 for hard infrastructure. The cost-effectiveness of EbA approaches is expected to benefit the project through the implementation of EbA activities in target project sites.

D. Consistency with national priorities

As a country, Tajikistan only recently started modifying their national policies and institutional frameworks to integrate the need for adaptation. Although the country has a relatively strong legislative framework regarding environmental protection, very few strategies or policies developed prior to 2010 acknowledge climate change as a cross-sector threat.

While climate change has not previously been acknowledged as a discrete threat, the importance of agriculture and water resources to the economy and to the country as a whole has been recognised. There are, therefore, numerous older policies, strategies and programmes that are synergistic with the outcomes of the project. The most significant of these is the 2003 National Action Plan for Climate Change Mitigation (NAPCC)^{237,238}. This is the only strategic framework specifically addressing the implications of climate change and is also strongly aligned to all three project outcomes. Other significant plans that align to project outcomes include the National Environmental Action Plan (NEAP)^{239,240} and the National Programme of Actions to Combat Desertification (NPACD)²⁴¹.

More recently, policies and strategies have moved to incorporating specific climate change terminology. These include the latest poverty reduction strategy, 'Living Standards Improvement Strategy of Tajikistan for 2013–2015' (LSIS)²⁴², which links water resource management and agricultural reform to a wider reduction in poverty. The 2011 'Strategic Program for Climate Resilience'²⁴³ is another synergistic programme that includes agriculture and SLM as one of its six focal components. The most recent National Development Strategy (NDS)²⁴⁴ reiterates the vulnerability of Tajikistan to climate

²³² Ligon E & Sadoulet E. 2007. Estimating the effects of aggregate agricultural growth on the distribution of expenditures. Background Paper for the World Development Report.

²³³ van Noordwijk M, Tata HL, Xu J, Dewi S & Minang PA. 2011. Segregate or integrate for multifunctionality and sustained change through rubber-based agroforestry in Indonesia and China. In Nair PKR & Garrity DP (eds) "Agroforestry: The Future of Global Land Use", Springer, The Netherlands pp 69–104.

²³⁴ from several studies occurring across different sites

²³⁵ De Groot RS, Blignaut J, van der Ploeg S, Aronson J, Elmqvist T & Farley J. 2013. Benefits of investing in ecosystem restoration. *Conservation Biology* 27:1286–1293.

²³⁶ Rao NS, Carruthers TJB, Anderson P, Sivo L, Saxby TA, Durbin T, Jungblut V, Hills T & Chape S. 2013. An economic analysis of ecosystem-based adaptation and engineering options for climate change adaptation in Lami Town, Republic of the Fiji Islands. A technical report by the Secretariat of the Pacific Regional Environment Programme. Apia, Samoa.

²³⁷ also referred to as 'The National Action Plan on Climate Resilience'

²³⁸ NAPCC 2003.

²³⁹ also referred to as 'The National Action Plan for Environmental Protection'

²⁴⁰ National Environmental Action Plan (NEAP). 2006. Government of Tajikistan.

²⁴¹ National Program of Actions to Combat Desertification (NPACD). 2001. Government of Tajikistan.

²⁴² LSIS 2013.

²⁴³ Strategic Program for Climate Resilience (SPCR). 2011. Government of Tajikistan.

²⁴⁴ NDS 2016.

change and advocates for the reduction and mitigation of the negative effects of climate change across multiple sectors. This strategy also identifies the centrality of agricultural productivity, water resources and capacity building to realise the targeted socio-economic growth by 2030.

Several of the more recent national strategies and policies in Tajikistan have already expired without renewal, for example NEAP 2011–2015. Other national strategies have been planned and approved but never implemented because of financial constraints, for example the State Programme on the Protection of River Banks²⁴⁵.

The GoT has made significant progress within its water sector by developing the Water Sector Reforms Programme for 2016–2025 (Water Reform Programme)²⁴⁶. While the programme is likely to modernise water management in Tajikistan, it does not adequately consider the impacts of climate change on the water sector. Furthermore, the focus of the Water Reform Programme is restricted largely to water resources management and does not adequately consider the impacts of multiple hazards at the river basin and watershed level. While flood management will be the responsibility of the RBOs established under the programme, other climate-linked hazards such as erosion and landslides are not addressed through its implementation²⁴⁷.

The proposed project aligns with these national priorities by promoting the climate resilience of rural Tajik citizens through the integrated management of climate vulnerable catchments and watersheds by using EbA methods. Watershed restoration using EbA will strengthen the provision of ecosystem services. These ecosystem services support both soil stabilisation as well as water retention and groundwater infiltration. Consequently, activities under the project will support and safeguard the livelihoods of Tajik farmers by reducing the climate change-related impacts of erosion and landslides. The EbA interventions that have been selected will also generate a number of co-benefits that will improve the livelihoods of Tajik farmers. These co-benefits will include improved agricultural productivity and income diversification.

Table 10 outlines the relevant national and sub-national strategies, plans and programmes that relate to project activities. For each, alignment to project outcome level is indicated.

Table 10. Consistency of project outcomes with national policies, plans, strategies and development goals.

Strategy	Year enforced	Alignment
National strategies		
National Development Strategy 2016–2030 (NDS) ²⁴⁸	2016	The primary focus of the NDS is on the long-term development of Tajikistan to improve living standards for the population. NDS objectives to achieving this include: i) poverty eradication; ii) sustainable economic growth; iii) promotion of sustainable consumption and production patterns; and iv) sustainable use of natural resources. The vulnerability of the Tajik population to climate change is acknowledged throughout the NDS, with the importance of agriculture and water management to alleviating this highlighted. Outcome 1 and 2 of the project therefore align with achieving the ultimate goal of the NDS in the country.
National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (CBD Strategy) ²⁴⁹	2003	Several interconnected components contribute to the primary objective of the CBD Strategy. A priority element of the ‘geo-system-level approach’ outlined in the CBD Strategy is the restoration and reforestation of degraded landscapes to reduce soil erosion, particularly in landslide and already eroded areas. Outcome 2 is aligned with this strategic component through implementing EbA activities that contribute to restoration and reforestation in degraded landscapes.
National Strategy on Disaster Risk	2010	The NDRMS identifies the significance of climate change-related disasters in the country such as droughts and high-water events. It is also acknowledged in the strategy that mitigation for

²⁴⁵ The State Programme on the Protection of River Banks is detailed in the Intended Nationally Determined Contribution (INDC) towards the achievement of the global goal of the UN Framework Convention on Climate Change (UNFCCC) by the Republic of Tajikistan.

²⁴⁶ Water Reform Programme 2015.

²⁴⁷ Water Reform Programme 2015.

²⁴⁸ NDS 2016.

²⁴⁹ CBD Strategy 2003.

Strategy	Year enforced	Alignment
Management for 2010–2015 (NDRMS) ²⁵⁰		<p>these types of events needs to be incorporated into the design phase of new development projects.</p> <p>The project is therefore aligned with the NDRMS under Outcome 1, relating to integrated catchment management which includes the improvement of water monitoring systems.</p>
The National Climate Change Adaptation Strategy (NCCAS) ²⁵¹	2016	<p>Within the NCCAS there are guidelines provided for priority adaptation actions to be undertaken in Tajikistan. The proposed project is well-aligned with the NCCAS because they both recognise that climate change effects on the agricultural sector result in significant negative impacts for the population. The NCCAS also recognises the potential of EbA as an effective adaptation approach.</p> <p>The NCCAS is currently in draft format and has not yet been accepted by the government. Notwithstanding this information, the proposed project is aligned with the NCCAS through both Outcome 1 and 2.</p>
Living Standards Improvement Strategy for the Republic of Tajikistan for 2013–2015 (LSIS) ²⁵²	2013	<p>LSIS recognises the cross-cutting nature of climate change adaptation in relation to environmental sustainability, economic growth and reducing poverty. The importance of water, soil quality and improving the capacity to collate and disseminate climate change information are also identified as important fields for poverty reduction.</p> <p>In this regard, all three outcomes of the project align with LSIS objectives.</p>
National programmes and plans		
National Program of Actions to Combat Desertification (NPACD) ²⁵³	2001	<p>Outcome 2 of the project aligns with the NPACD focus on ‘rational land tenure’ and ‘measure on rational nature using’. These focal points refer to the sustainable use of natural resources, with clear guidelines on reforestation and mitigating the effects of water erosion.</p> <p>Outcome 3 aligns with two further objectives of the NPACD, namely: i) the development of better platforms to disseminate climate change information; and ii) increasing the role of the local population in collecting and collating data.</p>
Strategic Program for Climate Resilience (SPCR) ²⁵⁴	2011	<p>The SPCR was developed in response to the specific vulnerability of Tajikistan to climate change and the associated economic, environmental and social impacts. It is the strategic overview of the Pilot Programme for Climate Resilience (PPCR), which consists of six core components. One of these core components is ‘Agriculture and sustainable land management’, which focusses on incorporating climate resilience into all sectors of land management.</p> <p>Outcome 2 of the proposed project has a strong alignment with this component.</p>
National Action Plan for Climate Change Mitigation (NAPCC) ^{255,256}	2003	The NAPCC is the only strategic framework in the country that specifically addresses the implications of climate change. All outcomes of the project are strongly aligned with the NAPCC.
National Environmental Action Plan (NEAP) ^{257,258}	2006	<p>The NEAP focusses on a broad spectrum of current environmental concerns, many of which are likely to be exacerbated by climate change. Amongst the most prevalent concerns included in the NEAP include: i) soil erosion; ii) deforestation and land degradation; iii) high water events; and iv) water scarcity.</p> <p>Outcome 1 and 2 of the project align with these concerns. The NEAP also recognises the need to improve environmental knowledge in Tajikistan at both institutional and local levels, which is complemented in Outcome 3 of the project.</p>
Water Sector Reforms Programme of the Republic of Tajikistan	2015	Under the Water Reform Programme, the GoT is initiating a shift towards managing water resources according to hydrographic rather than administrative boundaries. Further to this, the programme aims to promote the implementation of Integrated Water Resources Management

²⁵⁰ National Strategy on Disaster Risk Management for 2010–2015 (NDRMS). 2010. Republic of Tajikistan, Dushanbe.

²⁵¹ NCCAS 2016.

²⁵² LSIS 2013.

²⁵³ NPACD 2001.

²⁵⁴ SPCR 2011.

²⁵⁵ NAPCC 2003.

²⁵⁶ also referred to as ‘The National Action Plan on Climate Resilience’

²⁵⁷ NEAP 2006.

²⁵⁸ also referred to as ‘The National Action Plan for Environmental Protection’

Strategy	Year enforced	Alignment
for 2016–2025 (Water Reform Programme) ²⁵⁹		<p>(IWRM) at the basin level. IWRM was specifically defined for Tajikistan as being:</p> <p><i>“based on the interaction of various sub-sectors with the objective good accessibility to high quality water and sanitation services for the population, ensuring water availability for irrigation, hydropower, environment and other users in river basins defined by hydrographic boundaries. IWRM promotes the protection of water resources from over-exploitation and pollution; provides protection of vulnerable mountain environments including river banks and floodplains from flooding and erosion, and facilitates public participation in decision-making, planning, financing and development of water resources in the interests of economic growth, sustainable development of the society and preservation of the environment.”</i> ²⁶⁰</p> <p>River Basin Organisations (RBOs) and River Basin Councils (RBCs) will be established in each of the six identified basins, as well as in sub-basins as required. RBOs will mainly be responsible for: i) planning the use and protection of water resources annually and in the long-term; and ii) monitoring the distribution of water as well as the state of rivers. RBCs will mainly be responsible for reviewing the plans developed by the RBOs and managing interactions with stakeholders such as water users and Water User Associations (WUAs).</p> <p>RBOs are expected to become operational in 2019, with the GoT being expected to allocate ~US\$160,000 annually towards the operation of RBOs and RBCs.</p> <p>Outcome 1 aligns with the Water Reform Programme in involving RBOs and RBCs in developing an integrated catchment management strategy for the KRB.</p>
Agricultural Reform Programme of the Republic of Tajikistan for 2012–2020 ²⁶¹	2012	<p>The Agricultural Reform Programme includes a direct focus on mitigating the negative impacts of climate change for agricultural production. This includes the primary activity of ‘systematic reduction of soil erosion, land degradation and deforestation by improving natural resources management’. The programme includes a focus on EbA strategies with emphasis on soil erosion activities.</p> <p>Both Outcome 1 and 2 of the project align with these focal points of the Agricultural Reform Programme.</p> <p>Another important component of the programme is the ‘development and establishment of information management systems that would enable communities, local and national authorities to effectively collect, record and analyse reliable information on the impact of natural disasters and climate change’. Outcome 3 of the project is strongly aligned with this component.</p>
Strategies with a focus on climate change		
Greenhouse Gas Abatement Strategy (GHG Strategy) included in the NAPCC ²⁶²	2003	<p>In order to meet the UNFCCC commitments for Tajikistan, the GHG Strategy was developed with the focus to address the problem of source-based anthropogenic emissions.</p> <p>Outcome 2 of the proposed project aligns with the objective of promoting sustainable forms of agriculture in light of climate change considerations.</p> <p>Additionally, Outcome 2 aligns the priority of enhancing natural sinks of carbon including forests and soils.</p>
Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects (Adaptation Strategy) included in the NAPCC ²⁶³	2003	<p>In order to meet the UNFCCC commitments for Tajikistan, the Adaptation Strategy was included within the NAPCC to ensure that climate change adaptation remained a focal point for development in the country.</p> <p>Outcome 2 and 3 of the project align with the following components of the strategy:</p> <ul style="list-style-type: none"> • improvement of systematic observation and monitoring network for ensuring timely adjustment of adaptation measures; and • improvement of the data collection system and analysis, interpretation and dissemination of

²⁵⁹ Water Reform Programme 2015.

²⁶⁰ Water Reform Programme 2015.

²⁶¹ Agricultural Reform Programme for 2012–2020 of the Republic of Tajikistan. 2012. Ministry of Agriculture, Government of Tajikistan.

²⁶² NAPCC 2003, Section 8: Greenhouse Gas Abatement Strategy.

²⁶³ NAPCC 2003, Section 9: Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects.

Strategy	Year enforced	Alignment
		<p>the results among the end users.</p> <p>Outcome 1 of the project is aligned with two of the priorities relating to water resources:</p> <ul style="list-style-type: none"> • development of measures in the field of water resources protection, water and energy saving in the conditions of climate change; and • development of new, and improvement of existing technical and economical tools on water use at national and regional levels. <p>In addition, Outcome 2 of the project aligns with four of the five ‘measures of adaptation and minimisation of adverse impacts of climate change’ relating to land use. These are listed below.</p> <ul style="list-style-type: none"> • Zoning of territory depending on the extent and type of influence of climatic factors on the condition of lands taking into account its vulnerability to the different forms of erosion. • Setting a selection of soil protection measures for specific landscapes according to the influence of climatic and anthropogenic factors. • Conducting land-reclamation measures, which include crop rotation, soil protection and limiting the ploughing of steep lands that will help to conserve the humus in the soils under the expected conditions of climate change. • Forest rehabilitation measures in the regions prone to drought and wind erosion.
Laws		
Land Code of The Republic of Tajikistan (Land Code) ²⁶⁴	1996	The Land Code regulates all land relations and is directed at the rational use and protection of land. This focus is targeted to improve the fertility of soil, and to maintain and improve the natural environment. In this way, opportunities for equal development of all forms of economic activity will be promoted in Tajikistan.
Water Code of The Republic of Tajikistan (Water Code) ²⁶⁵	2000	The Water Code is aimed at regulating water relations to ensure rational use. This is so that there is adequate supply for the needs of the population and the natural environment.
Law of the Republic of Tajikistan on Land Reform (Land Reform Law) ²⁶⁶	1994	The Land Reform Law includes tasks listed by the GoT specifically for further developing land management. These tasks are all designed with the purpose to increase the agricultural production of the country and include the: i) creation of optimal conditions for equal rights; ii) development of various forms of land management; iii) formation of a multi-structural economy; iv) rational use; and v) the protection of land.
Law of the Republic of Tajikistan on Land Management (Land Management Law) ²⁶⁷	2001	The objective of the Land Management Law in Tajikistan is to create conditions for equal development for all sector in the country.
Law About Environmental Protection	2011	This law provides the legal base for developing the state policy on environmental protection. Further to this, it aims to conserve the natural resources of the country and ensure the environmental sustainability for socio-economic development. Therefore, the law ensures that the human right to a healthy environment is guaranteed.
Law on Ecological Expertise	2012	The law defines principles and norms for environmental experts to adhere to and provides for the prevention of negative impacts on planned economic interventions on environment.
Law on the Republic of Tajikistan on <i>Dehkan</i> Farms (<i>Dehkan Law</i>) ²⁶⁸	2016	This law defines the legal base for establishing and maintain the efficient functioning of <i>dehkan</i> enterprises. In addition, the law aims to create an enabling environment for the development of farming in the country.

E. Consistency with national technical standards

The proposed project is aligned with the requirements of the March 2016 Revision of the Environmental and Social Policy (ESP) of the Adaptation Fund (see Part II: K)²⁶⁹. Prior to project approval, the Full Proposal will be screened

²⁶⁴ Land Code of the Republic of Tajikistan (Land Code). No. 498 of 1997. Republic of Tajikistan.

²⁶⁵ Water Code: Law of the Republic of Tajikistan (Water Code). 2001. Government of Tajikistan, Dushanbe.

²⁶⁶ Republic of Tajikistan Law on Land Reform (Land Reform Law). 1994. Republic of Tajikistan.

²⁶⁷ Law of the Republic of Tajikistan “on Land Management” (Land Management Law). 2001. Republic of Tajikistan.

²⁶⁸ Republic of Tajikistan Law “on *Dehkan* Farms” (*Dehkan Law*). 2002. Republic of Tajikistan.

²⁶⁹ Refer to Part II: K on the environmental social impacts and risks of the project.

according to the UNDP Social and Environmental Safeguards Procedure²⁷⁰. This is to ensure that the necessary safeguards have been addressed and incorporated into the project design.

In addition to complementing the efforts of the CEP and the GoT to improve catchment management in the KRB, project activities will increase rural Tajik resilience to climate change in throughout the country. The Adaptation Fund-accredited Implementing Agency, UNDP, together with CEP and relevant national partners, will ensure that the project follows procedures outlined in the ESP. This includes the requirement that project activities funded by the Adaptation Fund reflect local circumstances and needs and draw upon national actors and capabilities.

The project will also adhere to all relevant national technical standards. At the Full Proposal development stage, the following legislation has been identified with relevance to the proposed activities:

- the 1996 Land Code of The Republic of Tajikistan²⁷¹;
- the 2000 Water Code of The Republic of Tajikistan²⁷²;
- the 2001 Law of the Republic of Tajikistan on Land Management²⁷³;
- the 2001 Law About Environmental Protection; and
- the 2012 Law on Ecological Expertise.

The relevance of each legislation to the project activities is detailed in Annex 4, Section 2.

Technical standards and relevant manuals or guidelines for project activities are listed below. All project activities will conform with the relevant national standards and guidelines where applicable.

Table 11. Proposed activities with applicable national technical standards or regulations

No.	Description	Relevant national standard, guideline or regulation
1	Construction of ‘protection’ gabions along rivers to provide buffers during flash floods.	Construction norms and standards on agro-industrial complex (SNIP) 2.30.05.001-03 Construction norms and standards on erosion-resistant gabion structures (SNIP) R 52132-2003 State standard on products produced for gabion structures. Twisted wire nets with hexagonal cells for gabion structures. Technical standard R 51285-99 Construction norms and standards on bank protection (SNIP) 4.02-91
2	The introduction of water-saving irrigation techniques such as drip irrigation, dry farming, composting/mulching and making use of cover crops.	Manual on drip irrigation
3	Rehabilitation/restoration of degraded forest ecosystems making use of <i>saxaul</i> species, as well as others.	Manual on establishment of saxaul plantations and soil stabilization
4	Sustainable harvesting for livelihoods from existing ‘healthy’ forest ecosystems.	N/A
5	Establishing livestock exclusion zones for the growing of fodder crops such as Lucerne and sainfoin.	Pasture Law of the Republic of Tajikistan Guidance on sowing lucerne and sainfoin.
6	Establishing shelterbelts to reduce the deposition of wind-eroded sediment on crops and integrating	Manual on establishment of shelterbelts and bio-drainages.

²⁷⁰ UNDP Social and Environmental Safeguards Procedure.

²⁷¹ Land Code 1997.

²⁷² Water Code 2001.

²⁷³ Land Management Law 2001.

No.	Description	Relevant national standard, guideline or regulation
	bio-drainage measures to improve water infiltration.	
7	Introducing indigenous and palatable grass seeds into degraded rangelands.	N/A
8	Introducing rotational grazing of livestock between pastures to assist with increasing field water absorption and decreasing water runoff.	Pasture Law of the Republic of Tajikistan.
9	Pasture management such as land-use planning and introducing improved management measures such as exclusion zones and rotational grazing of livestock.	Pasture Law of the Republic of Tajikistan.
10	Establishing joint forest management involving communities and local government.	Forestry Code of the Republic of Tajikistan Manual on establishment of Joint Forest Management Committee.
11	Introducing intercropping and agroforestry, and in specific areas may include apiculture, i.e. beekeeping.	Forestry Code of the Republic of Tajikistan Manual on establishment of commercial plantations.
12	Introducing sustainable long-term community services such as renewable energy and energy-efficient stoves.	Guidance on manufacturing of energy-efficient stoves.
13	Setting up shelterbelts in areas frequently exposed to erosion.	Manual on establishment of shelterbelts.
14	Establishing commercial plantations making use of an array of indigenous fruit species in degraded lands.	Forestry Code of the Republic of Tajikistan Manual on establishment of commercial plantations.
15	Introducing organic mulching for farmers to use on croplands which promotes soil fertility as well as water-saving.	Manual on mulching.
16	Diversifying crop use, including drought-tolerant and climate-resilient crops.	N/A
17	Establishing greenhouses for horticulture including local lemon, tomato and cucumber.	Manual on establishment of the greenhouses and growing citrus fruits.
18	Establishing community woodlots in abandoned areas for fuelwood.	Forestry Code of the Republic of Tajikistan Manual on establishment of commercial plantations.
19	Providing additional and improving existing extension services provision which will include developing advisories for farmers.	Manual on establishment of Field Farmer Schools and extension services.
20	Establishing on-farm water resource management.	Law on establishment of Water User's Association.
21	Rehabilitating existing irrigation, drainage and pumping systems.	Construction norms and standards on hydrotechnical facilities: (SNIP) 33-01-2003. Construction norms and standards on meliorative systems and facilities: (SNIP) 3.07.03-85. Construction norms and standards on foundations of hydraulic engineering structures (SNIP) 2.02.02-85 Construction norms and standards on trunk pipelines (SNIP) 2.05.06-85

No.	Description	Relevant national standard, guideline or regulation
		Construction norms and standards on technological equipment and technological pipelines (SNIP) 3.05.05-84

Given the small scale of the project’s EbA interventions in the target sites and communities, as well as their focus on environmental protection, Environmental Impact Assessments (EIAs) are not expected to be necessary for any of the planned interventions. In addition, the proposed projects activities are in line with national social norms, including gender equality and equal access.

F. Duplication in project design

There are a number of adaptation projects being implemented in Tajikistan with varying but similar objectives, including livelihood improvement, disaster risk reduction (DRR) and building climate resilience. The proposed project will complement these existing projects. In particular, there are three ongoing initiatives in the country that project activities will complement. These ongoing projects include: i) ‘Livelihood Improvement in Tajik-Afghan Cross-border Areas’ (LITACA); ii) ‘Strengthening Disaster Risk Reduction and Response Capacities’; and iii) ‘Facilitating Climate Resilience in Tajikistan’. Brief outlines of these projects are provided below. In addition to an overview of each project, justification is provided for why the project will not be a duplication of the respective projects’ efforts.

During implementation of project activities, a team will work closely with the project representatives – as well as other relevant initiatives – to identify the best possible opportunities for enhancing complementarity. [Table 11](#) outlines the alignment between ongoing projects and proposed project activities in Tajikistan.

Table 11. Alignment of current and ongoing initiatives in Tajikistan with the proposed project.

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Livelihood improvement in Tajik-Afghan cross-border areas, Phase II (LITACA) ²⁷⁴	<p>Fund: Government of Japan (GoJ)</p> <p>Fund grant: US\$10,559,227 (US\$3,600,000 Tajikistan portion)</p> <p>Timeline: 2018–2020</p>	The LITACA project is the logical continuation of the successes and lessons of the LITACA Phase I Project which took place between 2014 and 2017. Phase II aims to build on the results of Phase I by further strengthening the living standards of selected rural communities in the bordering areas of Tajikistan and Afghanistan. The project aims to improve living standards, stability and security through: i) reduced poverty, supported economic development; and ii) cross-border collaboration among the communities along the Tajik-Afghan border.	<ul style="list-style-type: none"> • Activities implemented under LITACA are partially linked to agriculture for example rehabilitation of irrigation facilities and efficient of water management/use. Best practices and lessons learned on agricultural activities and capacity-building of people in rural settings, particularly women, can contribute to knowledge sharing. • The LITACA project is supporting community-based infrastructure in Shaartuz and Kabodiyon. • Activities under the proposed project in the same geographical region as the LITACA project will benefit from: i)improved local infrastructure, particularly for irrigating agroforestry plots, fodder crops and other productive EbA interventions; and ii) capacity building activities with local service providers to manage local infrastructure (e.g. water supply, sanitation, irrigation and agricultural facilities). 	The proposed project will expand the best practices and lessons learned on strengthening community livelihoods through the creation of enterprises based on ecologically-sound EbA activities. Additionally, the project will provide a platform for activities similar to those in the LITACA project to be applied at a watershed and catchment-scale to build climate resilience in the KRB.

²⁷⁴ UNDP. 2018. Livelihoods Improvement in Tajik-Afghan Cross-Border Areas Phase II Project (LITACA II). Available at: Livelihoods Improvement in Tajik-Afghan Cross-Border Areas Phase II Project (LITACA II)

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Strengthening disaster risk reduction and response capacities ²⁷⁵	<p>Fund: Government of Japan (GoJ)</p> <p>Grant: US\$10,600,000</p> <p>Timeline: 2016–2020</p>	This project will support the Government of Tajikistan (GoT) to undertake a nation-wide risk assessment, establish and implement risk reduction measures and improve early warning. In addition, it will enhance the population's resilience to natural and man-made disasters by improving policy and operational frameworks for environmental protection and sustainable management of natural resources.	<ul style="list-style-type: none"> • Best practices and lessons learned on climate risk-reduction interventions can contribute to knowledge sharing. • Risk management responses from this GoJ project have informed the selection of EbA measures in the proposed project. 	The proposed project will use lessons learned and best practices from this GoJ-funded project for on-site risk management practices. These lessons learned and best practices will be included in watershed and catchment-level planning for building climate resilience. Furthermore, the proposed project will generate additional climate risk transparency by taking a multi-hazard risk identification approach.
Improved DRR Policy Making Mechanism. Strengthening Disaster Risk Governance in Tajikistan (SDRGT) ²⁷⁶	<p>Fund: Swiss Agency for Development and Cooperation</p> <p>Grant: US\$820,000</p> <p>Timeline: 2016-2019</p>	The project aims to reduce the negative human and material impact of disasters in Tajikistan by improving the management of governance of these disaster risks through: i) expanding approaches to risk governance at the national level involving the government and the international community; and ii) improving local risk governance using risk assessments, risk information-based land use planning and risk communications targeting land owners and users by selected local governments.	<ul style="list-style-type: none"> • Efforts applied in this project are linked to increasing awareness of specific river basin organizations (RBOs) on managing water-based risks (e.g., floods and drought) at and below the watershed level and linking local and RBO-level water-based risk management. 	Lessons learned and best practices from will be applied by this proposed project for developing multi-hazard climate risk models. In addition, existing RBOs will be capacitated to strengthen coordination and training mechanisms for watershed- and catchment-level planning and management. Further to improving the management of water-based risks, RBOs will be equipped to manage the risks of other climate-linked hazards such as erosion and landslides.
Facilitating climate resilience in Tajikistan ²⁷⁷	<p>Fund: Government of Russian Federation (GoRF)</p>	Through the effective use of climate and disaster risk information, this project aims to facilitate access to climate finance for communities in	<ul style="list-style-type: none"> • Information from community consultations will contribute to existing understanding of community preferences for risk management options. • Best practices and lessons learned 	The proposed project activities will be informed by lessons learned from the GoRF-funded project and integrate these into

²⁷⁵ UNDP. 2018. Strengthening Disaster Risk Reduction and Response Capacities in Tajikistan. Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/crisis_prevention_and_recovery/strengthening-disaster-risk-reduction-and-response-capacities-in.html

²⁷⁶ UNDP. 2018. Strengthening Disaster Risk Governance in Tajikistan . Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/crisis_prevention_and_recovery/strengthening-disaster-risk-governance-in-tajikistan.html

²⁷⁷ UNDP. 2018. Facilitating Climate Resilience in Tajikistan . Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/crisis_prevention_and_recovery/facilitating-climate-resilience-in-tajikistan.html

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
	<p>Grant: US\$950,130</p> <p>Timeline: 2018–2020</p>	disaster-prone mountainous regions of Tajikistan. The climate-resilience of these communities will therefore be enhanced.	on climate risk-reduction interventions can contribute to knowledge sharing.	catchment-scale climate risk management.
Kofirnighan River Basin Plan and Management Plan (KRBMP) ²⁷⁸	<p>Unpublished March 2018 draft authorised by the Fergana Valley Water Resources Management</p> <p>Timeline: 2018–2019</p>	The KRBMP will support the GoT in implementing the Water Sector Reform Programme for 2016–2025 by developing institutional mechanisms to improve water resources management at the basin- and local-level in the KRB. It also aims to develop a long-term basin plan for the use, protection and development of water resources, as well as annual or seasonal plans for the distribution and management of KRB water resources.	<ul style="list-style-type: none"> • Focused information on sustainable water resources management in the KRB can contribute to the development of basin-specific catchment management strategies. • Watershed delineation that is expected to be delivered through the development of the KRBMP will be utilised by the proposed project. 	While the KRBMP will introduce a catchment approach to water resources management in the KRB, this plan will not consider the integrated management of land and water resources for climate resilience. The proposed project will expand on the KRBMP by demonstrating an integrated approach to managing climate risks within a catchment through the use of EbA. Such management will take the upstream – downstream linkages of climate change risks into account. The proposed project will also demonstrate how to effectively manage rural watersheds to yield catchment-wide adaptation benefits.
Building climate resilience of vulnerable and food insecure communities through capacity strengthening and livelihood diversification in mountainous regions of Tajikistan ²⁷⁹	<p>Fund: Green Climate Fund (GCF)</p> <p>Fund grant: US\$9,300,000</p> <p>Partner: World Food Programme (WFP)</p> <p>Partner grant: US\$346,000</p> <p>Timeline: 2018–2022</p>	This initiative will introduce adaption measures to address climate change effects leading to declines in agricultural yields, increases in food prices and reduced agricultural wages. It will focus on the most vulnerable and food insecure communities in the Rasht valley, Khatlon and Gorno-Badakhshan Autonomous Region (GBAO) regions.	<ul style="list-style-type: none"> • Possibility for using data, methodologies and practices related to SLM in the proposed project. • Geographical overlap in the south of the KRB. 	Many of the activities in the proposed project align with the objectives of the WFP project. The proposed project will provide additionality by promoting a catchment management approach to the implementation of adaptation measures in agriculture. This will ensure that the interventions proposed in the WFP project are implemented strategically, so as to manage climate risks. Such catchment-level risk management

²⁷⁸ Fergana Valley WRM 2018 KRBMP Unpublished.

²⁷⁹ Green Climate Fund (GCF). 2018. Project FP067: Building climate resilience of vulnerable and food insecure communities through capacity strengthening and livelihood diversification in mountainous regions of Tajikistan. Projects and programmes. Available at: <https://www.greenclimate.fund/> [accessed 11.07.2018].

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
				measures will also de-risk the investments of the WFP project and increase the WFP project's sustainability and scalability.
Tajikistan: building climate resilience in the Pyanj River Basin ²⁸⁰	Fund: Strategic Climate Fund Grant: US\$21,550,000 Timeline: 2013–2020	The project aims to increase resilience to climate vulnerability and change of communities in the Pyanj River Basin. The project's impact will be improved livelihoods of Pyanj River Basin communities vulnerable to climate variability and change.	<ul style="list-style-type: none"> Useful information and practices on diversified livelihoods to contribute to knowledge sharing. 	The Strategic Climate Fund project aims to rehabilitate infrastructure in the Pyanj River Basin and does not include any EbA components or components that will strengthen planning for climate risk management. Activities under the proposed project will largely focus on introducing an EbA approach to the KRB, as well as introducing and integrated climate risk management approach at a catchment level. The two projects are complementary in that both will achieve climate resilience benefits
Climate adaptation through sustainable forestry in important river catchment areas in Tajikistan (CAFT) ²⁸¹	Fund: KfW Development Bank Grant: US\$9,884,880 Timeline: 2015–2018	Rehabilitation, conservation and sustainable use of forests contribute to the adaptation of the country to climate change and the conservation of biodiversity, as well as to the improvement of livelihoods of the local population in the project areas.	<ul style="list-style-type: none"> Useful information and practices on the use and management of agro-biodiversity conservation. Information and best practices for conservation and adaptation management for replication in other areas of the country. 	Lessons learned and best practices will be used to inform several activities of the proposed project, particularly EbA interventions involving plant establishment (for example forest restoration, sustainable harvesting, forest management, agroforestry, and the establishment of shelterbelts and woodlots). In addition, support for the development of Enterprise Plans (EPs) for community members will be provided by the proposed project to promote the sustainability of

²⁸⁰ Asian Development Bank (ADB). 2018. Tajikistan: Building Climate Resilience in the Pyanj River Basin. Sovereign (Public) Project 45354–002. Available at: <https://www.adb.org/projects/45354-002/main#project-pds> [accessed 11.07.2018].

²⁸¹ GIZ. Adaptation to climate change through sustainable forest management. Available at: <https://www.giz.de/en/worldwide/29916.html>

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
				ecologically-sound natural resource-based businesses.
Tajikistan: Water Resources Management in Pyanj River Basin Project ²⁸²	<p>Fund: ADB</p> <p>Grant: US\$25,000,000</p> <p>Partner: Japan Fund for Poverty Reduction</p> <p>Partner grant: US\$5,000,000</p> <p>Timeline: 2016–2022</p>	The project aims to improve institutional and physical capacities of water resources management (WRM) system in PRB of southern Tajikistan. In particular, it will implement a Pyanji River Basin Management Plan, as well as improving irrigation infrastructure and water management practices.	<ul style="list-style-type: none"> The ADB-funded project has a similar outcome to the KRBMP mentioned above. Complementarities between the ADB-funded project and the proposed project will mainly be through knowledge sharing across two river basins. 	The proposed project is expected to contribute lessons learned about catchment management that considers both land and water resources management to all river basins in Tajikistan, including the Pyanji River Basin.
Strengthening Critical Infrastructure against Natural Hazards ²⁸³	<p>Fund: International Development Association (IDA) Grant</p> <p>Fund grant: US\$25,000,000</p> <p>Partner: IDA</p> <p>Partner grant: US\$25,000,000</p> <p>Timeline: 2017–2023</p>	The objectives of the Strengthening Critical Infrastructure Against Natural Hazards Project for Tajikistan are to strengthen the recipient's disaster risk management capacities, enhance the resilience of its critical infrastructure against natural hazards, and improve its capacity to respond to disasters.	<ul style="list-style-type: none"> Potential for information and best practices to be shared. 	The proposed project will provide additional risk management and risk identification approaches. Specifically, the proposed project will introduce multi-hazard risk models and EbA as a risk management approach to the KRB. The IDA-funded project does not consider EbA and focuses largely on irrigation and drainage, as well as road infrastructure.
Aid for Trade in Central Asia Project, Phase IV ²⁸⁴	<p>Fund: Government of Finland</p> <p>Grant: US\$2,500,000 (Tajikistan portion)</p> <p>Timeline: 2018–2022</p>	The project aims to support Central Asian countries in promoting inclusive and sustainable growth patterns in rural areas and within green productive sectors. The project works on the macro (policy), meso (institutions) and micro (SMEs and producers) levels ensuring that interventions at the three levels are mutually supportive to ensure a focused impact level. The output levels target the following: <ul style="list-style-type: none"> Supporting an 	<ul style="list-style-type: none"> Five of the project's fish farms occur within three districts of the proposed project: Varzob, Gissar/Karatag, Romit/Vahdat. These businesses are highly vulnerable to climate change impacts and are particularly dependant on water resources in the KRB. The project is supporting value chains for greening via various project activities including: green loans, energy efficiency introduction at processing/production SMEs, green farming and introduction of International Standards. 	The vulnerability of natural resource-based value chains to climate change impacts will be reduced through the implementation of project activities such as EbA interventions designed to increase ecosystem services.

²⁸² ADB. 2018. Tajikistan: Water Resource Management in Pyanj River Basin Project. Sovereign (Public) Project 47181–002. Available at: <https://www.adb.org/projects/47181-002/main> [accessed 11.07.2018].

²⁸³ The World Bank. 2018. Available at: <http://projects.worldbank.org/P158298?lang=en> [accessed 23.07.2018].

²⁸⁴ UNDP. 2018. Wider Europe: Aid for Trade in Central Asia: Phase III. Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/poverty_reduction/aid_for_trade_II.html

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
		<p>enabling environment for job-rich sustainable growth; and</p> <ul style="list-style-type: none"> Supporting market opportunities for all through more efficient and competitive producers and processors. <p>Two cross-cutting themes are gender equality and environmental sustainability.</p>		
Biodiversity and ecosystem services in agrarian landscapes ²⁸⁵	<p>Fund: GIZ</p> <p>Grant: US\$4,650,000</p> <p>Timeline: 2016–2020</p>	The project aims to strengthen individual and institutional capacities and knowledge on increasing biodiversity and sustainable use of ecosystem services in agrarian landscapes (two villages in Ayni and three in Rasht Valley).	<ul style="list-style-type: none"> Both projects include the use of ecosystem restoration in agrarian landscapes. Consequently, lessons learned on ecosystem interventions are expected to be shared between the two projects. 	The proposed project will be implementing EbA strategically at the watershed and river basin scale to reduce the impacts of future climate change. This will provide valuable lessons learned about integrating EbA into climate-resilient catchment management in Tajikistan.
Central Asia Hydrometeorology Modernization Project (CAHMP) ²⁸⁶	<p>Fund: International Development Association (IDA), and Climate Investment Fund</p> <p>Grant: US\$27,700,000</p> <p>Timeline: 2018–2021</p>	The project aims to improve the accuracy and timeliness of hydrometeorology services in Central Asia, with particular focus on the Kyrgyz Republic and Republic of Tajikistan.	<ul style="list-style-type: none"> Useful information on climate change in Tajikistan for improving hydrometeorology services. Potential for information and best practices to be shared regarding the development of the National Strategy on climate change adaptation and sectoral action plans on adaptation. 	Accurate, basin- and watershed-level data will be generated from rehabilitated or newly-established weather stations within the KRB. Data and information from these weather stations, in addition to that from several other sources, will be collated and disseminated to promote the implementation and adaptive management of climate-resilient integrated catchment management within the KRB.

²⁸⁵ GIZ. Biodiversity and ecosystem services in agrarian landscapes. Available at: <https://www.giz.de/en/worldwide/52789.html>

²⁸⁶ The World Bank. 2018. Central Asia Hydrometeorology Modernization Project. Available at: <http://projects.worldbank.org/P120788/central-asia-hydrometeorology-modernization-project?lang=en&tab=financial>

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Transboundary water management in Central Asia ²⁸⁷	<p>Fund: GIZ</p> <p>Grant: US\$ unknown</p> <p>Timeline: 2009–2019</p>	<p>Phase III of the programme (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) focuses primarily on strengthening regional institutions and sustaining the experiences gained in the previous phases. The programme supports the Central Asian institutions regulating matters of water distribution at the regional level. Overall, the programme: i) strengthens the political position of institutions in the region; ii) advises on the formulation of legal provisions and guidelines; and iii) supports the development of practical measures for integrated water resources management.</p>	<ul style="list-style-type: none"> • Activities are complemented by a number of pilot projects in selected river basins, which demonstrate the potential benefits of improved water use. • Useful information on irrigated agriculture across the region addresses: i) improved availability and predictability of water; ii) better functioning infrastructure; and iii) better planning for natural hazards. 	<p>The proposed project will implement lessons learned and best practices generated by this project. In addition, the proposed project will contribute to improving watershed- and basin-level aspects of water resource management, associated infrastructure (such as weather stations), and multi-hazard climate risk management.</p>
Regional programme for sustainable and climate sensitive land use for economic development in Central Asia ²⁸⁸	<p>Fund: GIZ</p> <p>Grant: US\$ unknown</p> <p>Timeline: 2016–2019</p>	<p>The programme aims to support government agencies and the private sector in Central Asia adopt integrated, economically and ecologically sustainable forms of land use, taking climate change into account. The programme pursues activities in six areas: pasture, forests, environmental economics, climate change adaptation, knowledge management, and environmental education and awareness raising. The project aims to support regionally adapted approaches for the participatory and sustainable management of land resources with a focus on the integration of different forms of land use, such as pasture and forest management, and</p>	<ul style="list-style-type: none"> • The regional pasture network launched within this project will serve as a platform for information exchange (using the modern and convenient online data management system) 	<p>The sustainability of natural resource-based businesses within the KRB (that are ecologically-sound and climate-resilient) will be increased through <i>inter alia</i> capacity building, the development of Enterprise Plans (EPs) and the provision of agro-ecological extension services. In addition, through the proposed projects component on knowledge management, the evidence-base generated by the project has the potential to facilitate the upscaling of integrated catchment management approach using EbA to other river basins in Tajikistan and the greater Central Asian region.</p>

²⁸⁷ GIZ. Transboundary water management in Central Asia. Available at: <https://www.giz.de/en/worldwide/15176.html>

²⁸⁸ GIZ. Sustainable and climate sensitive land use for economic development in Central Asia. Available at: <https://www.giz.de/en/worldwide/14210.html>

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
		their economic valuation at both macro and micro levels (nationwide)		

G. Knowledge management

For details on knowledge management within the proposed project, refer to Component 3 outlined in Part II: A. Component 3 includes activity-specific details on how information-sharing and knowledge management are included in the project design.

Specifically, knowledge-sharing and management has been integrated into the project design through three outputs. These are summarised below.

Under Output 3.1, existing knowledge management centres will be supported through project activities. These existing centres have been selected based on their focus on development work and/or adaptation within Tajikistan. The UCA is a regional academic institution that is focusing its efforts in rural Tajik communities to improve their resilience to climate change. All data collected by the UCA is accessible by the Open Centre under the DoG. The Open Centre is a housing platform for data and information and is available to the public for viewing and use. By supporting both UCA and the Open Centre, the project activities will encourage researchers to access previous and ongoing work to inform future developments. In addition, awareness will be raised among both government, private institutions and communities through providing support to the knowledge centres.

Under Output 3.2, an impact evaluation framework will be conducted that will enable management that is adaptive and integrated.

Both Output 3.1 and 3.2 will then contribute towards the strengthened knowledge exchange practices between communities and government under Output 3.3. Awareness will also be raised through the strengthened interactions between communities and government.

H. Consultation process

A wide range of stakeholders were consulted with during the scoping and validation phase of proposed project development. A consolidated stakeholder consultation report is attached as Annex 1 and an extensive stakeholder consultation report has been prepared. This report is available online via this [link](#).

Importantly, the project's Executing Entity, the CEP, was consulted through the iterative process of refining the project design. As the national organisation responsible for implementing adaptation projects in the country, CEP is comprised of numerous technical experts. Therefore, CEP is well-positioned to ensure that the project design is tailored to local requirements, that it benefits vulnerable groups and includes necessary gender considerations.

A Validation Workshop was held in Dushanbe on 22 June 2018 that included representatives from relevant KRB districts, international organisations, academia and partner projects.

I. Funding justification

Component 1. Integrated catchment management to build climate resilience.

Baseline scenario (without AF resources)

The **baseline scenario** is that rural development in Tajikistan is not informed by an integrated catchment management strategy. Agricultural productivity will continue to decline as increasing climate change impacts accelerate erosion at a landscape scale. Local communities will continue to be exposed to climate hazards because climate risks are not accounted

for in district and sub-district planning and development. Climate information and advisories will not be disseminated to local farmers in vulnerable catchments because of a lack of adequate climate information services in Tajikistan.

Additionality (with AF resources)

The **preferred solution** is that a climate-resilient catchment management strategy is developed and operationalised at the district and sub-district level. This strategy will be informed by multi-hazard climate risk models (MHCRMs) and by detailed climate data from automated weather stations. The strategy will detail appropriate risk management approaches for improving resilience to climate risks and identify mechanisms for disseminating advisories tailored to local communities. Local authorities will be capacitated to implement catchment management strategies. The overall climate resilience of rural communities will be increased because of: i) reduced exposure to climate risk as a result of a climate risk management approach to rural development and land management; and ii) increased adaptive capacity as a result of strengthened local government capacity.

Component 2. Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.

Baseline scenario (without AF resources)

The **baseline scenario** is that ecosystems in rural Tajikistan continue to be degraded as a result of a combined effect of unsustainable land management practices and the impacts of climate change. Ecosystems goods and services will be further compromised by rapid erosion, resulting in declines of agricultural productivity and hydropower generation. Hydrometeorological disasters will continue to increase, as ecosystem services such as soil stabilisation and flood attenuation are further compromised. This will result in increasingly negative impacts on Tajikistan's economy and the health and well-being of its population.

Additionality (with AF resources)

The **preferred solution** is that EbA is implemented by local communities in rural Tajikistan. EbA interventions will provide goods and services that reduce climate change impacts²⁸⁹ and strengthen rural livelihoods. Agro-ecological extension centres will be supported to ensure they provide relevant technical support to communities on EbA. This support will also ensure that the implementation of interventions will be informed by fine-scale land-use plans.

The sustainability and replicability of EbA interventions will be ensured through the development of a market environment for EbA. Enterprise Plans (EP) will be developed by communities to implement EbA activities that promote climate resilience.

Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.

Baseline scenario (without AF resources)

The **baseline scenario** is that lessons learned and best practices on EbA are not systematically collated. Information on climate risks and EbA will continue to be fragmented. This will hinder the effective implementation of EbA interventions as uncertainty around the effectiveness of EbA interventions will remain. Without an appropriate evaluation framework, decision-makers will lack reliable information on the benefits of EbA as well as the effectiveness of different interventions within the local context. Local communities will continue to lack access to comprehensive and reliable information on climate risks and adaptation best practices.

Additionality (with AF resources)

By providing support to existing knowledge management centres, these entities will be responsible for collating, analysing and disseminating information on climate risks and EbA. Providing this support thereby ensures that up-to-date information is accessible in a coherent manner. This information will be disseminated to decision-makers and local

²⁸⁹ such as soil stabilisation, flood attenuation and groundwater recharge

communities via appropriate communication channels, to ensure that all stakeholders benefit from information on climate risk and adaptation measures. The knowledge centre(s) will share information with local communities through mass media channels such as mobile applications, websites, brochures and radio broadcasts. They will also engage with existing local knowledge exchange structures. In this way, knowledge on climate risks and EbA will be disseminated broadly and in a locally-appropriate manner.

An impact evaluation framework will be developed under Component 3 that will enable the evaluation of the benefits of EbA interventions. This framework will promote the use of sampling methodologies to ensure the accurate attribution of social, economic and environmental benefits to EbA interventions. The knowledge centre will continue to manage and apply the framework beyond the project lifespan, ensuring that future EbA interventions in Tajikistan are monitored adequately.

J. Sustainability of the project

Project components have been designed to ensure the sustainability and replicability of project benefits in the long term. Specifically, project sustainability will be supported through: i) promoting the active participation of relevant regional²⁹⁰, national and district level stakeholders in decision-making and implementation of project activities; ii) strengthening institutional and technical capacity at *raion* and *jamoat* levels to ensure that stakeholders have adequate knowledge and skills to maintain the benefits of the project EbA interventions; and iii) raising the awareness of the benefits of integrated catchment management practices, including EbA, CSA and SLM activities, at the village level.

Particular aspects of project sustainability per component are described below.

Component 1 will develop the capacity for catchment management informed by climate risks. Multi-hazard climate risk models (MHCRMs) developed for the KRB in Output 1.1 will inform future planning to develop climate resilience. Such models will then be readily replicable for other catchments across the country. The PES models developed in Output 1.5 will strengthen the sustainability of project interventions by ensuring sustainable financing for climate-resilient management and EbA.

Agro-ecological extensions centres supported and trained under **Component 2** will also contribute to project sustainability. This is because the impacts of the training will continue beyond the lifespan of the project, continuing to provide extension services to local communities. These communities will use these services to inform the implementation and maintenance of EbA interventions, thereby ensuring the sustainability of such interventions. Moreover, EbA interventions are inherently more sustainable than traditional infrastructure, as ecological infrastructure is multi-purpose and flexible. Generally, EbA interventions require less maintenance than non-EbA alternatives and such maintenance can usually be conducted by unskilled labourers. As a result, the proposed interventions will be more likely to be maintained than non-EbA alternatives.

By supporting the knowledge management centre(s) under **Component 3**, it is ensured that's climate information, as well as lessons learned, are accessible for decision-makers and local communities. The impact evaluation framework [under Output 3.2] will enable adaptive management on project interventions and will also allow for accurate attribution of EbA benefits. This will help to demonstrate the cost-effectiveness of EbA, thereby promoting its use to develop climate resilience in communities across Tajikistan.

K. Environmental and social impacts and risks

The proposed project activities were evaluated against the Adaptation Fund (AF) Environmental and Social (E&S) Principles to identify potential negative impacts. A detailed analysis on the AF ESP is provided in *Annex 4: Environmental and Social Management Framework (ESMF)*. Results of the assessment of the project according to the UNDP Social Environmental Screening Policy (SESP) and the AF E&S Principles are listed below. The completed UNDP SESP screening template is available in *Annex 6: UNDP Social and Environmental Screening Procedure (SESP)*. The risks presented were compiled using the following baseline documents:

²⁹⁰ such as representatives from international UCA campuses

- Project’s Environmental and Social Management Framework (ESMF);
- UNDP Social and Environmental Screening Procedure (SESP);
- Project’s Consolidated Stakeholder Consultations and Missions Report;
- World Bank (2016). Tajikistan Agriculture Sector Risk Assessment;
- Project’s “Marginalized and vulnerable groups/Gender Analysis: Prioritization of vulnerable communities and groups for climate change adaptation interventions in selected districts of Kafernigan River Basin” (UNDP, 2019);
- Project’s “Land Use and Climate Change: Restoration of forests and pastures in Kafernigan River Basin: Lessons learned, good practices and recommendations for selected districts”.

Table 12 below provides an overview of the types of environmental and social risks of the proposed project.

Table 12: Overview of Environmental and Social Impacts and Risks

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment required for compliance
<i>Compliance with the Law</i>	<p>The project activities (components and sub-projects) have been designed to comply with relevant national laws, regulations and policies (incl. nationally endorsed programmes and strategies). The project activities adhere to the following relevant legislation:</p> <ul style="list-style-type: none"> - 1996 Land Code of the Republic of Tajikistan - 2000 water Code of the Republic of Tajikistan - 2001 Law on Land Management - 2001 Law on Environmental Protection - 2012 Law on Ecological Expertise. <p>The full list of national laws, regulations and policies and relevant of each legislation to the project activities are detailed in Annex 4, Section-III of the project proposal (ESMF, “National Policy Framework for Environmental and Social Matters”).</p>	<p>Low: Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.</p>
<i>Access and equity</i>	<p>Project activities are designed in part to support grazing control measures (rotational grazing), establish livestock exclusion zones and reforestation measures in places where</p>	<p>Mid: Project activities could temporarily restrict availability and/or quality of, access to, resources</p>

	<p>degradation levels are severe, and which provide very limited benefits to linked communities. These measures will impact temporarily such communities by limiting their access to benefits from those areas, however in the mid to long term such communities are expected to benefit more.</p> <p>Stakeholder consultation missions carried out by UNDP project teams revealed communities are well aware of degradation levels with regards to pastures, forests and the need for improved fodder production and vegetation. Communities reportedly understand the impacts of control and restoration measures and welcome such measures to take place in their communities.</p> <p>To further support sustainability of given measures, the project has designed measures to reduce extensive livestock grazing through enhanced fodder production techniques (within exclusion zones, rotational grazing, on-site production, demonstration plots, etc), productive on-site animal husbandry, and establishment of watering sites at mid-stream levels of catchment/watershed areas (saving livestock energy in search of water sources in the upstream). To further inform communities of anticipated benefits, the project will carry out cost-effectiveness analysis with mid- to long-term impacts.</p> <p>To address short-term restrictions concerning access to pasture lands and forests, the project will promote alternative business opportunities (income generating demonstration activities) and community enterprise developments that will help communities generate compensating incomes. The project is also foreseen introduction of energy-efficient stoves into target communities to compensate for limited access to forest resources.</p>	<p>where a land use change can displace an economic activity (as rotational grazing control, re-forestation). Potential impacts will be monitored on a regular basis through participatory representative approach to ensure access and equity is equally provided to all communities and groups.</p>
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	<p>The project will engage widely with relevant stakeholders at regional, sub-regional and community levels to agree on rotational routes for the transit of larger herds and eliminate potential disregards of implemented grazing control measures applied locally by large herd owners from other communities, districts and/or regions. Jamoat level monitoring and control mechanisms will be introduced to enforce agreed measures for elimination of land degradation and improving vegetation growth in target pasture lands, and ensure that target communities effectively benefit from project interventions.</p> <p>Project activities are designed to promote fair and equitable access to benefits in a manner that is inclusive. Activities will not exacerbate existing inequities, particularly with respect to marginalised or vulnerable groups. For this purpose, UNDP teams have conducted Stakeholder Consultation Missions (1-7 March, 11-22 June, 19-26 December 2018) with participation of development partner agencies, counterpart ministries and institutions, Kafernigan river basin authorities, women organizations, Dehlan Farms and Water Users Associations, and heads of communities. In addition, relevant Assessments have been carried out to adequately identify marginalized and vulnerable groups, vulnerable climate affected communities, vulnerable women and households, as well as consultations regarding suitable sub-projects for the given groups.</p> <p>The project is designed to maintain such approach with fair participation of all representative groups with particular focus on marginalized and vulnerable, during the decision making processes. The Project Steering Committee will monitor the level of participation of relevant community members</p>	
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	<p>in Pasture User Groups, Women Committees, River Basin Organizations, Forest Community Management groups, as well as level of fairness and access to project benefits that is equal and equitable for all target communities.</p>	
<p><i>Marginalized and vulnerable groups</i></p>	<p>Marginalized and vulnerable groups in project area of Kafernigan river basin have been generally identified (i) population groups or communities that live in areas with increased impacts of climate change. The same applies to those groups who have land plots/agricultural lands in areas potentially vulnerable to impacts of climate change. In particular, marginalized and vulnerable groups include: (ii) poor and food insecure households (households with incomes below poverty line), households with limited or no productive assets (livestock, agricultural land plots), (iii) female headed households, (iv) households with majority children and elderly members, (v) households with handicap members/individuals, and (vi) households without manpower due to relatively higher rates of labor outmigration among men (to Russian Federation and elsewhere).</p> <p>Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project implementation. For this purpose, UNDP has compiled information on the abovementioned groups with support from local authorities. Reportedly, district authorities maintain regular updates of vulnerable and marginalized population.</p> <p>UNDP has developed a Stakeholder Engagement Plan, which will guide consultations inclusively during implementation phases, assuring broad representation within existing relevant community based organizations and groups.</p>	<p>Mid: Vulnerable and marginalized groups may have (i) limited mobility to participate during key stages of project implementation, and (ii) limited access to entitled productive assets (ref. degraded pastures and forests). Stakeholder Engagement Plan developed by the project will guide inclusive participation of such groups in decision making processes. In cases where a land use change can temporarily displace an economic activity (as rotational grazing control, re-afforestation), in accordance with domestic laws and regulations, the project identified compensatory income generating opportunities which will be offered to vulnerable and marginalized groups. Potential impacts will be monitored to ensure such opportunities materialize.</p>

	<p>Such organizations and groups have been consulted during stakeholder consultation missions and include farming associations and cooperatives, women’s committees, intervention related initiative groups, pasture development associations, water users associations, forestry cooperatives and communal health promoters.</p> <p>As part of the given Stakeholder Engagement Plan the project will regularly monitor and assess the extent of involvement of marginalized and vulnerable within such organizations and groups. Community mobilization specialists appointed jointly by the UNDP and district authorities will organize focused consultations with such groups to design sub-projects tailor-made and suitable for vulnerable and marginalized households.</p> <p>In each of the selected project target districts of Kafernigan River Basin, UNDP jointly with District Authorities have identified communities that are located within areas vulnerable to hazardous climatic events. In addition, project will carry out localised vulnerability assessments of target communities in a participatory manner for tailor-made activities suitable to the local context. Where feasible, such groups will be prioritised for concrete adaptation interventions. The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women’s committees, intervention related initiative groups, pasture development associations, Water User Associations (WUA), forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized people within</p>	
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	<p>such groups and associations.</p> <p>Targeted actions that may be prioritized and suitable for vulnerable groups include on-farm adaptation interventions, household plot productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) are also determined to be suitable for the given groups to ensure benefits are distributed inclusively and equitably.</p>	
<p><i>Human rights</i></p>	<p>Project activities will respect and, where applicable, promote international human rights. Tajikistan is the most vulnerable country to climate change in Central Asia. Negative effects of climate change on the Tajik population include glacial and permafrost melt, increased rainfall intensity and longer and more frequent dry spells. Together, these effects have increased the rate of topsoil erosion, threatening the livelihoods, health and wellbeing of the population. Losses from natural hazards currently amount to ~20% of the country's GDP and climate change impacts are predicted to increase the frequency and magnitude of such losses. In the future, loss amounts are expected to rise from ~US\$50 million in 2014 to ~US\$132 million by 2030. Approximately 33% of all agricultural losses in the country are currently attributable to climate change and variability.</p> <p>The project will support Tajikistan's authorities and target population to enhance the climate resilience amongst small-scale farmers and pastoralists of Kofirnighan River basin. Improving the climate resilience of these communities will involve developing a climate-resilient catchment management</p>	<p>Low: Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.</p>

	<p>strategy to inform the planning and development of rural areas in adapting to the increasing impacts of climate change. Interventions will also promote sustainable management of natural resources through an integrated landscape approach to catchment management.</p> <p>The project will directly benefit an estimated 46,000 individuals who are especially vulnerable to the impacts of climate change, through the design and implementation of concrete on-the-ground EbA interventions for more efficient natural resources management. These measures will also provide social and economic benefits to target population in terms of livelihoods, health and wellbeing of the population. In terms of human rights mainstreaming, the impact is multidimensional in nature and addresses the right to food, energy, water, health, etc.</p> <p>In particular, the project's interventions have the following social and economic benefits for target population: (a) increased profit margins and farm income, (b) reduced loss of crops and land caused by slope instability, drought or dry spells and also caused by ineffective agricultural practices and livestock grazing/breeding; (c) reduced agricultural inputs, water consumption and thus production costs; (d) reduced risk of economic failure due to diversification of production on and off-farm; (e) reduced crops susceptibility to pests; (f) increased nutrition and food security for local communities; (g) increased provision of fuelwood and timber and reduced loss of trees to drought or dry spells; and (h) increased pasture productivity, fodder production and carrying capacity.</p> <p>The project is designed to ensure benefits are shared broadly in a non-discriminatory and equitable manner. All relevant stakeholders</p>	
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	<p>will be involved in decision-making processes and consultations, and that such participatory processes are transparent. Necessary strategies, action plans, site selection criteria and lessons learned will be documented and shared regularly through community driven consultation platforms that the project will seek to facilitate.</p>	
<p><i>Gender equity and women's empowerment</i></p>	<p>Project activities are designed so that all genders are: i) able to participate fully and equitably; ii) receive comparable social and economic benefits; and iii) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy.</p> <p>Under the Land Code, women and men have equal rights to access and manage land. According to the World Bank (2011), 78% of female-headed households (where there is no working-age male) manage land, compared to 89% of male-headed households, and 91% of female-headed households with at least one working age male. Under the Family Code and the Civil Code, within registered marriages, spouses have equal property rights, but this does not apply to unregistered, religious marriages, leaving many women unable to claim their property rights when the relationship breaks down.</p> <p>A gender analysis has been carried out during the project development phase, which identified vulnerabilities and resilience of women groups to various impacts of climate change in KRB – with special consideration of land resource use, natural disaster risk management, water resources management, pasture and forest resources use. The given analysis will feed into regular M&E throughout project implementation, and vulnerabilities of women will be monitored against identified risk areas.</p>	<p>Mid: Vulnerable women may not be adequately represented in decision-making or participation in the design and implementation of the sub-projects. As a result, they may have limited access to resources, opportunities and benefits. Women's engagement and participatory mechanisms will be put in place. Dedicated gender focal points will be assigned both at project level and in each target community to proactively identify particularly vulnerable women, including those with restricted mobility and other conditions. Such proactive inclusion approaches will ensure that the project addresses women's adaptive needs</p>

	<p>The Focused Group Discussions carried out with women groups during project development phase (December 2018) have identified suitable EbA activities most beneficial to women, and therefore special emphasis will be placed on these activities whilst design of sub-projects during preparatory phases of project implementation.</p> <p>The project anticipates that at least 50% of beneficiaries will be women. The stakeholder participation mechanisms for sub-project formulation and implementation include provisions to ensure that women are able to represent their interests effectively, and the social impact indicators and corresponding targets of the project will be gender-sensitive, ensuring that women receive an equitable share of benefits and that their status and interests are not marginalized.</p> <p>For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated. Furthermore, when possible, measures and techniques that that can have a positive impact by closing the gap of inequality between men and women will be promoted.</p>	<p>As part of the project M&E system systematic monitoring will be undertaken to ensure women’s participation, involvement and empowerment.</p>
<p><i>Core labour rights</i></p>	<p>The Republic of Tajikistan has ratified 8 fundamental ILO conventions. The country has a comprehensive legislation to protect labour rights in aspects as forced labour (C029), freedom of association and protection of the right to organize (C087), right to organize and collective bargaining (C098), equal remuneration (C100), abolition of forced labour (C105), discrimination (employment and occupation) (C111), minimum age (C138), and worst forms of child labour (C182).</p> <p>The Project will be implemented in</p>	<p>Low: Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.</p>

	<p>compliance with legislation including the Labour Code (2016). National and regional stakeholders were involved during the design stage of the project to ensure core labour rights have been respected and considered. Compliance with all labour rights will be ensured in all project activities through the involvement of labour officers in target villages.</p> <p>Component 2 will involve labour for the implementation of EbA interventions, where community members will provide the labour. All of the labour involved will be on daily wages where the wages will be determined according to tasks. Wage rate will be calculated on the basis of prevailing minimum wage rate for the assigned task. The record of work done for labour engaged will have to be maintained and the wages paid accordingly. Hours of work and the timing of the hours will be determined in consultation with the labour provided and the prevailing practices in the area.</p> <p>Positive discrimination in favour of women may be used to provide fair and equal opportunity to women to seek employment as labour. All forms of negative discrimination in respect of employment and occupation will be eliminated. The project will not engage in child labour in any of its activities or interventions. All forms of forced or compulsory labour will be eliminated.</p> <p>Under Component 2, local community members may be exposed to the risk of accidents while implementing EbA interventions. In addition, there is a low risk of child labour outside the limits of the law.</p>	
<i>Indigenous populations</i>	Kafernigan river basin (target area for project implementation) does not have any	N/A

	indigenous populations.	
<i>Involuntary resettlements</i>	<p>The project will not cause any involuntary resettlement of communities. However, sub-projects targeted at pasture grazing control measures, re-forestation, and agricultural demonstration land plots may involve displacement of economic assets (pasture lands, agricultural lands, forests). To eliminate or minimize any possible harm to potential incomes, the project will target severely degraded lands (pastures, forests) which are feasibly compensable with alternative income-generating activities targeted to affected communities or groups.</p> <p>Sub-projects in such areas will be implemented only if compensatory income generating opportunities are offered and agreed with respective users (target communities). The Consolidated Stakeholder Consultations and Missions Report provided in Annex 1 of the proposal indicates preliminary list of income generating activities that can be offered as compensation to affected communities.</p> <p>Moreover, the Proposal also includes cost-benefit analysis (Table 9, Annex 9) for proposed community level interventions that will be used to accurately estimate compensating measurements. Such analysis will further be upgraded in the course of project implementation.</p>	<p>Low: Physical resettlements are not necessary for the activities, however, temporary economic displacement (agricultural lands, pastures, forests) are possible due to planned grazing control measures, reforestation activities and introduction of agricultural demonstration plots. Sub-projects will be implemented in such areas where displacement of economic assets is both temporary (short-term) and voluntary. Necessary monitoring will include compliance with related laws, human rights, international provisions and grievance mechanism.</p>
<i>Protection of natural habitats</i>	<p>By implementing EbA activities, the project promotes the improved management of natural landscapes. The project is therefore likely to result in the improved protection of natural habitats rather than having any negative effect. Moreover, the project will consult and involve responsible officers and community representatives at district and village level to ensure this principle is</p>	<p>Low: Project activities will be carried out on areas already under usage, but there is low risk that the construction of EbA interventions could result in the destruction of small areas of natural habitat. Natural habitats are</p>

	<p>adhered.</p> <p>Project activities under Component 2 will be carried out on areas already under usage. The preliminary assessments (“Land Use and Climate Change: restoration of forests and pastures in KRB”) have revealed vulnerable communities vulnerable to climate change, and with severely affected pastures, forests and vegetation, which will be considered as target for project implementation. Among such areas no natural habitats are discovered (in or near).</p> <p>Despite this focus on improving ecosystem goods and services, there is a low risk that the construction of EbA interventions could result in the destruction of small areas of natural habitat.</p>	<p>determined and defined by the Government of Tajikistan (Committee for Environmental Protection), and UNDP will monitor project interventions and mitigating measures will be taken in case any sub-projects are selected to be implemented within or relative proximity to such defined natural habitats.</p>
<p><i>Conservation of biological diversity</i></p>	<p>The Project will be supporting activities in environmentally sensitive areas, but this work will aim at reducing impacts in these areas with a net positive impacts. Project activities will be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.</p> <p>The project promotes the rehabilitation/restoration of abandoned and overexploited forests and degraded forest ecosystems, as well as reforestation of areas adversely affected by extreme climate events. The use of native and climate-resilient varieties will be promoted, but alien species may be introduced if necessary. Certain alien species may be used for complementary planting (climate-resilient crops seed varieties) in areas being reforested to increase biological biodiversity and enhance climate resilience. Prior to such introduction, relevant experts at the Committee for Environmental Protection (CEP) and among development</p>	<p>Low: There is a risk that alien and/or invasive alien species are used in reforestation activities. Prior to selection of suitable species, the project Team jointly with Ministry of Agriculture and Forestry Agency will fact check applicability against endorsed inventory of species proven harmless for Kafernigan River Basin. Joint monitoring of flora and fauna changes will also be carried out. The Project will also support the setting up of a procedure for tracking, monitoring and registration of restoration actions implemented. During the last year of the</p>

	<p>partner agencies will be consulted on successful examples across the regions.</p> <p>National environmental norms, standards and procedures for the introduction of alien species will be followed and monitored in each case.</p>	<p>project an ecological and land use assessment will be carried out to evaluate the rate of success of the restoration.</p>
<p><i>Climate change</i></p>	<p>Project activities will not result in any significant or unjustified increase in GHG emissions or other drivers of climate change.</p> <p>The project’s designed activities directly support implementation of ecosystem-based adaptation, including climate-smart agriculture and sustainable land management in agro-ecological landscapes. Such actions include rehabilitation and restoration of degraded forest ecosystems, vegetation growth support, water retention measures, establishing saxaul plantations, climate-resilient crop seed planting, and others to prevent and mitigate water related adverse climatic events that have typically posed risks to livelihoods and health of target communities.</p> <p>Current and predicted climatic variability has been taken into account during project design. Throughout the inception and implementation phase, any changes in the climate will be taken into account in planning for the implementation of EbA activities. Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. Species will be planted in appropriate seasons to reduce risk of hazard impact.</p> <p>The project also aims to build climate resilience through development of a</p>	<p>Low: Climate change adaptation of communities will be included in M&E. GHG emissions risk will be monitored and managed. Compliance with related laws will be monitored and concerns through the grievance mechanism addressed in accordance with respective laws and regulations.</p>

	<p>catchment management strategy to manage and operationalize climate risks at district and Jamoat levels in Kafernigan river basin. The project will develop multi-hazard climate risk models (MHCRM) for vulnerable watersheds in KRB and provide technical support for the modernization of automated weather stations in the most vulnerable districts of KRB. These will help authorities and communities adequately assess risks, climate related projections and incorporate these risks in the Kafernigan River Basin Management Plans to make informed decisions on EbA activities.</p>	
<p><i>Pollution prevention and resource efficiency</i></p>	<p>Project interventions are not expected to produce any significant amounts of waste or other pollutants. The Project will support communities to adopt improved farming techniques, such as organic agriculture, soil and water conservation, more resilient crop varieties, that would reduce the use of fertilizers and pesticides. Although biological pest control will be preferred, potentially harmful pesticides may be needed for specific use. In this particular case, they will be properly managed, stored, and used in accordance with national and international standards, regulations and procedures.</p>	<p>Low: Pest control measures and agricultural support may involve potential use of pesticides. Selection and use of suitable pesticides chosen for application will be consulted with the Ministry of Agriculture. Compliance with available Pest Management regulations and manuals endorsed by the Ministry of Agriculture will be duly monitored.</p>
<p><i>Public health</i></p>	<p>The EbA measures may involve small-scale construction of water saving irrigation systems, rain water harvesting systems in water-scarce zones, rehabilitation of irrigation, draining and pumping systems and on-farm water resources management.</p> <p>The Project will follow related environmental impact assessment procedures and ensure compliance with national construction standards and norms, sanitary norms and regulations, and other national laws and regulations (forestry, water, environment, and health). Most relevant technical norms and standards include:</p>	<p>Low: Small-scale construction activities (Component 2) may pose safety risks to community members. Regular monitoring will be conducted for compliance with national construction norms and standards, as well as WHO guidelines on Water Safety Plans (drinking water and sanitation).</p>

	<ul style="list-style-type: none"> - Construction norms and standards on hydro-technical facilities: (SNIP) 33-01-2003; - Construction norms and standards on irrigation systems and facilities: (SNIP) 3.07.03-85; - Construction norms and standards on foundations of hydraulic engineering structures (SNIP) 2.02.02-85; - Construction norms and standards on trunk pipelines (SNIP) 2.05.06-85; - Construction norms and standards on technological equipment and technological pipelines (SNIP) 3.05.05-84. <p>The project will also follow technical guidance and best practices regarding rain-water harvesting systems, drip-irrigation techniques, and micro-reservoirs that are not adequately institutionalized across the country. Other activities may include construction of gabions, terracing, bank enforcement and small dams, the project will assess best practices and lessons learned to address community safety risks from such construction.</p> <p>With regards to safe drinking water supply and sanitation, UNDP will implement and promote knowledge about requirements of adopted guidelines of WHO on Water Safety Plan Approach.</p>	
<i>Physical and cultural heritage</i>	<p>No adverse impacts are foreseen on physical and cultural heritage of the people in target communities and areas. Project activities are designed through a participatory and consultative approach and with support of key government institutions (i.e. Committee for Environmental Protection, Ministry of Agriculture, Forestry Agency. Chances to damage any physical assets are practically negligent.</p>	<p>Low: Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.</p>
<i>Lands and soil</i>	<p>The project, by design, promotes the</p>	<p>Low: Necessary</p>

<p><i>conservation</i></p>	<p>conservation of soil and land resources. Specifically, through the implementation of EbA activities in Component 2 – including agroforestry – soil stability will be increased, the runoff of nutrients from topsoil will be reduced, and the fertility of soil at target sites will be increased.</p> <p>An integrated catchment management strategy will be developed for the KRB which will be operationalised at district, Jamoat and village levels. The strategy will provide detailed guidelines for suitable landscape management interventions to reduce the vulnerability to climate change.</p> <p>These interventions are designed to comply with the principles of sustainable land management (SLM) and climate-smart agriculture (CSA) wherever applicable. The training will be targeted at all levels (district, Jamoat, village). In so doing, the project will enhance support services to villages and enable participatory, local-level planning. The lessons learned from the project will enable a policy and investment framework to be developed for replicating and scaling up EbA interventions across the country. Existing knowledge management platforms and hubs will be used for promoting this replication and upscaling.</p>	<p>monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.</p>
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Based on the findings presented above, the proposed project activities are unlikely to result in significant negative social and environmental impacts. The Project is ranked as **Category B (Moderate)** across all components. The project does not foresee any high risk impacts against the environmental and social principles, and potential adverse impacts are less widespread, reversible and easily mitigated. Most impacts are likely to occur during the construction phase of EbA interventions. These impacts are likely to be minor and without long-term adverse effects.

The AF ESMF and SESP Report will serve to guide all aspects of project implementation. It will be the responsibility of the PSC to ensure that the appropriate risk mitigation measures are implemented during project implementation. Other actions that contribute to reduce risks are detailed in the ESMF (*Annex 4: Environmental and Social Management Framework*).

PART III: IMPLEMENTATION ARRANGEMENTS

A. *Implementation arrangements*

Implementing entity

The Committee for Environmental Protection (CEP) under the Government of the Republic of Tajikistan is the government institution responsible for the implementation of the project and will act as the Executing Agency (EA). The Ministry of Agriculture, Ministry of Energy and Water Resources, Agency for Land Reclamation and Irrigation along with other relevant national entities will act as project partners and will become part of Project Steering Committee.

The Committee for Environmental Protection will be responsible for executing this five-year project with the support of the UNDP under UNDP's National Implementation Modality (NIM). At the request of the Government of Tajikistan, UNDP is the Multilateral Implementing Entity (MIE). The project is nationally implemented (NIM), in line with the Standard Basic Assistance Agreement (SBAA, 1993) and the UN Development Assistance Framework (UNDAF) 2016-2020 between the UN and the Government of Tajikistan, as well as Country Programme Document 2016-2020 between UNDP and the Government of Tajikistan.

As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key general management and specialized technical support services. These services are provided through UNDP's global network of country, regional and headquarters offices and units and include assistance in: project formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of staff and consultants; general oversight and monitoring, including participation in reviews; receipt, allocation and reporting to the donor of financial resources; thematic and technical backstopping; provision of systems, IT infrastructure, branding, and knowledge transfer; research and development; participation in policy negotiations; policy advisory services; programme identification and development; identifying, accessing, combining and sequencing financing; troubleshooting; identification and consolidation of learning; and training and capacity building.

As outlined in UNDP's application to the Adaptation Fund Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of execution modalities determined on country demand, the specificities of an intervention, and a country context. Under the national execution modality proposed, UNDP selects a government entity as the Executing Entity based on relevant capacity assessments performed by UNDP. Please note that UNDP uses slightly different terminology to that used by the operational policies and guidelines of the Adaptation Fund. In UNDP terminology, the "executing entity" is referred to as the "Implementing Partner" in countries which have adopted harmonized operational modalities and the "Executing Entity" in countries which have not yet done so. The Executing Entity is the institutional entity entrusted with and fully accountable to UNDP for successfully managing and delivering project outputs. It is responsible to UNDP for activities including: the preparation and implementation of work plans and annual audit plans; preparation and operation of budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and personnel; financial and progress reporting; and monitoring and evaluation. As stated above, however, UNDP retains ultimate accountability for the effective implementation of the project.

The CEP will assume responsibility for the implementation, and the timely and verifiable attainment of project objectives and outcomes. It will provide support to the management unit, and inputs for, the implementation of all activities. The CEP will nominate a high-level official who will serve as the National Project Director (NPD) for project implementation. The NPD will chair the Project Steering Committee and be responsible for providing government oversight and guidance to the implementation. The NPD will not be paid from project funds but will represent a Government in kind contribution.

UNDP has the technical and administrative capacity to support the Committee for Environmental Protection and assume the responsibility for mobilising and effectively applying the required inputs to reach the expected outputs.

The financial arrangements and procedures for the project are governed by the UNDP rules and regulations for National Implementation Modality (NIM). All procurement and financial transactions will be governed by applicable UNDP regulations under NIM.

UNDP Direct Project Services as requested by Government: The UNDP, as the Multilateral Implementing Entity for this project, will provide project management cycle services for the project as defined by the Adaptation Fund Board. In addition, the Government of Tajikistan may request UNDP direct services for specific projects, according to its policies and convenience. If requested the services would follow the UNDP policies on the recovery of direct costs. These services (and their costs) are specified in the Letter of Agreement (Annex 7). As is determined by the AF Board requirements, these service costs will be assigned as Project Management Cost, duly identified in the project budget as Direct Project Costs.

Comparative advantage

UNDP's comparative advantage in supporting the implementation of development programmes in Tajikistan is its presence both at the policy and operational levels. This set-up enables UNDP to obtain and use the evidence from the ground to influence policy formulation and discussions. Because of the specific nature of most development projects requiring physical presence on the ground, additional comparative advantages of UNDP include, but are not limited to, its: i) physical presence on the ground; and ii) continuous partnerships maintained with the development actors, local authorities and beneficiary communities. Because of this on-the-ground presence and experience with work in different sectors and communities – including the water sector – UNDP is in a prime position to be the IE for the proposed project.

Presence on the ground

UNDP has five Area Offices ([Figure 8](#)) located in:

- Gharm in the north-east of Rasht Valley;
- Khujand and Ayni in the north of Soughd Region; and
- Kulyab to the south-east and Shaartuz to the south-west of Khatlon Region.

Kulyab and Shaartuz Area Offices cover all districts of Khatlon Region, including the eight districts bordering Afghanistan, namely Qumsangir, Kabodiyon, Jilikul, Shaartuz, Pyanj, Farkhor, Hamadoni and Shurobod. Figure 15 illustrates the regions covered by each Area Office.

Through these offices, UNDP has implemented over 100 community development, poverty alleviation, disaster risk reduction, energy and environment, conflict management and other development programmes and projects totalling US\$52 million. These programmes and projects have benefited over 3,000,000 people living in 46 rural districts, which is ~1,228 rural Tajik communities.

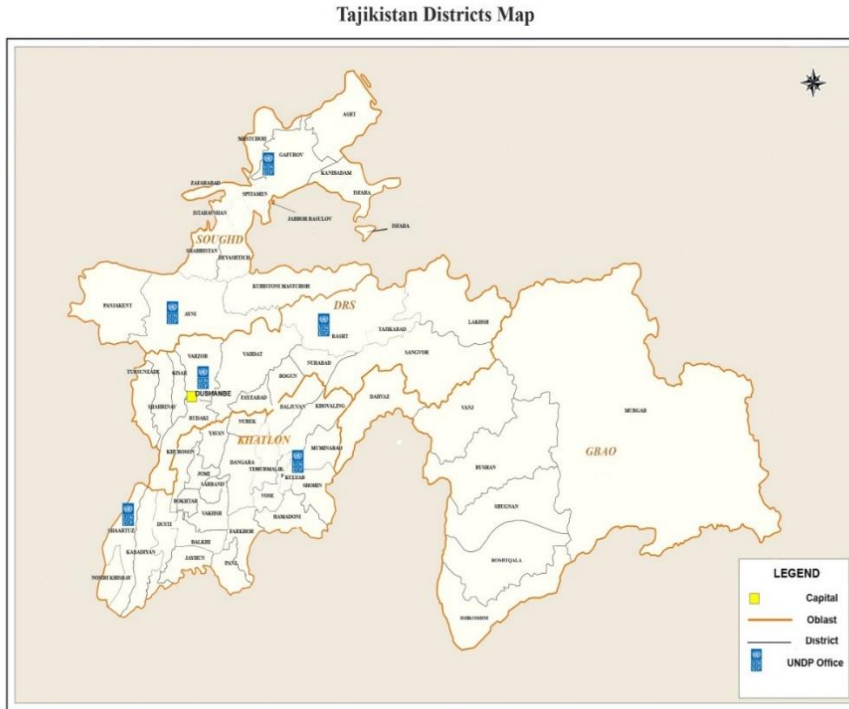


Figure 8. Map of Tajikistan indicating the six UNDP Area Offices.

Experience in the water sector

UNDP and the GoT have effectively collaborated in the past and because of this, GoT has considerable trust in UNDP's capability. This enables UNDP to facilitate the formation and convening of high-level policy dialogue. As a UN coordinating agency, UNDP is also able to ensure synergies and has access to resources from other UN system agencies, including FAO, UNECE and UN-Water.

UNDP's leadership in and support for the water sector over recent years has grown, presently focusing on policy and governance with pilot interventions in the Ferghana Valley²⁹¹. UNDP's support to the Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme)²⁹² is evident through the implementation of several projects:

- EU-funded project titled, 'Promoting integrated water resources management and fostering transboundary dialogue in Central Asia';
- UNDP-funded project titled, 'Enabling activities to promote the national consultations on post-Rio agenda and demonstrate IWRM approaches in Tajikistan';
- UNDP/Bureau for Crisis Prevention and Recovery (BCPR) project titled, 'Strengthening conflict management capacities (including transparent resource allocation and sound water management principles) for dialogue in conflict-prone areas of Tajikistan';
- Eurasian Development Bank (EDB) project titled, 'Feasibility study to construct and operate small hydro-power stations on irrigation facilities in Tajikistan', Phases I and II;
- Swiss Development Cooperation (SDC) funded project titled, 'Tajikistan Water Supply and Sanitation'; and
- Swedish International Development Cooperation Agency (SIDA) project funded through the Stockholm International Water Institute (SIWI) titled, 'Applying human rights-based approach to water governance in Tajikistan'.

²⁹¹ particularly with the Isfara Transboundary River Basin

²⁹² Water Reform Programme 2015.

The above projects were included under the umbrella of Integrated Water Resources Management (IWRM) which is a central principle of the GoT-adopted Water Reform Programme. In doing so, UNDP adopted a strategic approach of linking policy work at the national level with practice in the field, ensuring top-down and bottom-up feedback informing both policy-makers and practitioners on effective mechanisms for reform implementation. The UNDP IWRM programming is principally aimed at developing and implementing national IWRM and water efficiency strategies at national and basin level. Because of this, the intervention strategy is supported by both IWRM governance and institutional reform, as well as concrete projects implemented to improve: i) irrigated agriculture; ii) rural water supply and sanitation; and iii) small-scale hydropower service delivery. At the regional level, UNDP contributes to transboundary trust building and conflict prevention through strengthening water cooperation mechanisms in the Fergana Valley.

UNDP has been involved in most policy initiatives for the water sector. Involvement at the national level was aimed towards developing an enabling environment for coordination and establishing a unified approach to policy development. This involvement has resulted in a harmonised reform process towards developing improved water cooperation and conflict mitigation at a regional level. A list of UNDP's actions, roles and responsibilities under the umbrella of IWRM programming is included below.

- UNDP played an active role in elaborating policy proposals for water sector reform, specifically providing designs to principal resolution and introducing IWRM principles into the Water Code²⁹³.
- The development of an analytical review, titled 'Current conditions and perspectives on integrated water resources management in the RT', provided reflections on existing challenges and recommendations in the water resource management field. This review described the legal, institutional, technical and financial (economic) aspects of IWRM as well as detailed perspectives for the country's transition to basin management approach.
- UNDP supported GoT institutions in improving the legal and institutional framework for the country, developing by-laws and implementation mechanisms for the Water Code²⁹⁴ and the Law on Drinking Water²⁹⁵.
- UNDP was responsible for facilitating the establishment and support of the Inter-Ministerial Coordination Group (IMCG) on drinking water supply²⁹⁶. The IMCG was primarily formed to assist in design and implementation of the state policy on development of the drinking water and water supply sector.
- Because of UNDP's support to the IMCC, significant progress was made on policy proposals and implementation mechanisms for the drinking water and supply sector. The following issues were focused on through UNDP's support:
 - practising ownership and operational management rights;
 - modelling institutional structures at the district and sub-district levels;
 - simplifying procedures for obtaining permits for project implementation;
 - modelling effective tariff scheme and scheme implementation; and
 - improving governance, transparency, accountability and consumer participation in water systems management.
- UNDP's contribution to transboundary water cooperation has been significant over recent years. Specifically, UNDP assisted with improving water management in the transboundary basin of Syr Darya in the Fergana Valley²⁹⁷. This programme benefited border communities of Tajikistan and Kyrgyzstan. UNDP conducted a review, titled 'Consolidated review of water resources management in transboundary Isfara River Basin', for both countries to identify main barriers to water distribution. The review identified the challenges for overcoming the barriers to water distribution between border communities. In addition, the review included recommendations for efficient water management, conflict management and the development of proposals for further interventions to improve transboundary water cooperation between the two countries.
- UNDP has also undertaken a series of ground-level interventions to implement specific elements of the IWRM approach. The range of these interventions are listed below.
 - Rehabilitation of hydrological posts in Matpari, Tangi, Vorukh and Rabot to ensure more accurate and transparent record of hydrological events. The rehabilitation process also included monitoring water resource flows in the Isfara River Basin. Results of this monitoring had an effect on fair regional water distribution between Kyrgyzstan and Tajikistan at both upstream and midstream levels, and between Tajikistan and Uzbekistan at the downstream level.

²⁹³ Water Code 2001.

²⁹⁴ Ibid.

²⁹⁵ Law of the Republic of Tajikistan on Drinking Water and Water Supply (Law on Drinking Water). 2010. Government of Tajikistan, Dushanbe.

²⁹⁶ Swiss Agency for Development and Cooperation (SDC). 2012. The Fourth Meeting of the Inter-Ministerial Coordination Council on drinking water supply discussed realization of human right to water and sanitation in Tajikistan (IMCC). SDC, UNDP and Oxfam.

²⁹⁷ Soughd Region, Isfara River Basin

- Rehabilitation of water supply facilities project, titled ‘Inter-state irrigation canal ‘Druzhba’ and drinking water supply system in cross-border Chorku Jamoat’. The rehabilitation was accompanied by the application of good governance and sound water management principles. These principles highlighted the importance of transparency for water distribution as a main criterion for sustainability.
- Providing support for water management through a project titled ‘Support to inter-stream water cooperation in Isfara River Basin’. The outcomes of this project ensured sound water management and distribution at the basin level among farming communities at upstream, midstream and downstream levels. This resulted in the reducing the risk of conflicts over resource distribution. Reducing water demand through a demand-driven approach at all stream levels by providing improved maintenance of irrigation canals and management support based on transparency and participation have been central in achieving this result. This is being implemented by providing significant support to previously established Water User Associations and their federation in Isfara River Basin.

Project Steering Committee (PSC) will be convened by CEP and will serve as the project’s coordination and decision-making body. The PSC meetings will be chaired by the NPD. It will meet according to necessity, but not less than once in 6 months, to review progress, approve work plans and approve major deliverables. The PSC is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined. The PSC’s role will include: (i) overseeing project implementation; (ii) approving all work plans and budgets, at the proposal of the Project Manager (PM), for submission to Istanbul Regional Hub; (iii) approving any major changes in plans or programmes; (iv) providing technical input and advice; (v) arbitrating any conflicts within the project and/or negotiating solutions between the project and any other stakeholders and (vi) overall evaluation.

Project Assurance: UNDP Tajikistan will support project implementation by assisting in monitoring project budgets and expenditures, recruiting and contracting project personnel and consultant services, subcontracting and procuring equipment. UNDP Tajikistan will also monitor the project implementation and achievement of the project outcomes/outputs and ensure the efficient use of donor funds through an assigned UNDP Team Leader. UNDP will act as the Senior Supplier and Project Assurance. In this role, UNDP will also monitor project performance in relation to UNDP’s Social and Environmental Safeguards Policy (SESP) as well as the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

National Project Director (NPD): The NPD will be a member of CEP, assigned to the project for its period of duration. The NPD’s prime responsibility is to ensure that the project produces the results specified in the project document to the required standard of quality and within the specified constraints of time and cost.

Mechanisms for local participation: the project will use the existing locally established mechanisms for local consultation and participation.

An organogram of the project organisation structure is illustrated in [Figure 9](#).

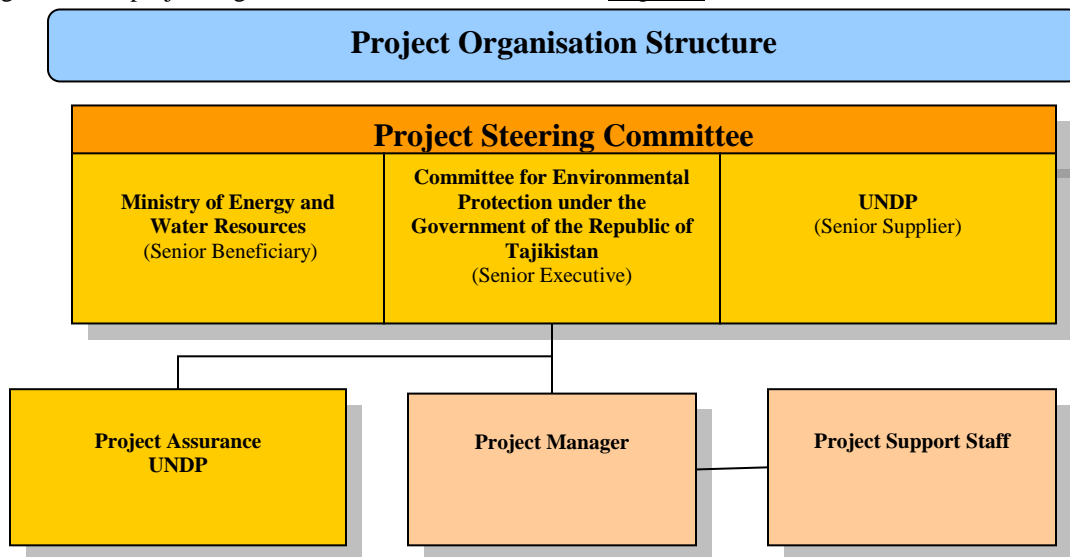


Figure 9. Organogram of project organisation structure.

A specially formed **Project Steering Committee (PSC)** will be responsible for the implementation of the project. The PSC will include representative of UNDP in Tajikistan, as well as representatives from relevant stakeholders including CEP and MEWR. In addition, the PSC will be responsible for ensuring the effective coordination of this project with other relevant initiatives in Tajikistan.

In addition, consultative committees will be formed, consisting of representatives from local government in the project areas, community representatives, and individuals with technical expertise. The consultative committees will provide technical guidance and feedback to the PSC.

The day-to-day administration will be carried out by a Project Manager (PM), Project Analyst (PA), Admin. Finance Assistant (AFA), and Project Assistant (PA), who will be located at UNDP premises. As per Government requests, the staff will be recruited using standard UNDP recruitment procedures. The PM will, with the support of the AFA and PA, manage the implementation of all activities, including: preparation/updates of work and budget plans, record keeping, accounting and reporting; drafting of terms of reference, technical specifications and other documents as necessary; identification, proposal of consultants, coordination and supervision of consultants and suppliers; organization of duty travel, seminars, public outreach activities and other events; and maintaining working contacts with partners at the central and local levels. The Project Manager will liaise and work closely with all partner institutions to link the project with complementary national programmes and initiatives.

The PM is accountable to UNDP for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Annual Work and Procurement Plans (AWP&PP) The PM will further produce quarterly operational reports and Project Performance Reports (PPR). These reports will summarize the progress made versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring activities. The PM will be technically supported by contracted national and international service providers, based on need as determined by the PM and approved by the PSC, as needed. Recruitment of specialist services will be done by the PM, in accordance with UNDP’s rules and regulations.

B. Financial risk management

Financial and project management has been conducted according to UNDP’s Programme and Operations Policies and Procedures to ensure that financial and project risks are mitigated against. Detailed financial and project risks as well as the associated mitigation strategies identified have been outlined in [Table 13](#).

Table 13. Financial and project risk management measures for the proposed project, including risk ratings.

Risk no.	Identified risk	Risk rating	Mitigation measure
1.	Disagreement amongst stakeholders regarding demonstration of site selection.	Low	<ul style="list-style-type: none"> Intervention sites will be selected using an agreed upon list of criteria and the developed shortlist of EbA interventions to ensure the selection is transparent and equitable. There will be a participatory approach to project activities, particularly with intervention site selection.
2.	High turnover of staff members in executing and implementing agencies may negatively impact on project deliverables.	Low–medium	<ul style="list-style-type: none"> Proposed project will build partnerships between government and non-government agencies to ensure continuity.
3.	Loss of government support may result in lack of prioritisation of proposed project activities.	Low	<ul style="list-style-type: none"> Regular stakeholder consultation and involvement will be undertaken to ensure that government maintains its commitment and considers the project as a support mechanism to its existing climate change adaptation programmes.
4.	Institutional capacities and relationships are not sufficient to provide effective solutions to climate problems that are complex and multi-sectoral.	Medium	<ul style="list-style-type: none"> The project design has a focus on building institutional capacity. This will ultimately lead to the development of an appropriate institutional framework for analysing climate change impacts on the management of <i>inter alia</i> water, land use, natural resources and pastures.
5.	Capacity constraints of local institutions may limit the ability to undertake the interventions	Medium	<ul style="list-style-type: none"> Human resource capacity will be developed in all targeted regions and villages. Collaboration and exchange between local institutions and

	implementation.		<p>regional/international research institutes will be initiated.</p> <ul style="list-style-type: none"> • An Integrated Catchment Management Specialist will work closely with the Programme Manager to ensure timely delivery of project outputs.
6.	Priority interventions implemented are not found to be cost-effective.	Low	<ul style="list-style-type: none"> • Cost-effectiveness is a core principle in the implementation of adaptation measures. Detailed information will be recorded regarding cost-effectiveness. This will be disseminated through the knowledge centres supported by the project and will be of use to future adaptation initiatives for the Kofirnighan River Basin and Tajikistan as a whole. • Interventions to be selected for the EbA shortlist will be chosen based on their previous success and results in the country.
7.	Lack of commitment/buy-in from local communities may result in failure of intervention sites.	Medium	<ul style="list-style-type: none"> • A stakeholder engagement plan will be developed during the inception phase. • Community stakeholders will continue to be consulted with throughout the project inception and implementation phase.
8.	Current and predicted climate variability and/or extreme climate events result in poor results for EbA interventions.	Medium	<ul style="list-style-type: none"> • Current and predicted climatic variability has been taken into account in project design. Throughout the inception and implementation phase, any changes in the climate will be considered in planning for the implementation of EbA activities. • Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. • Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. • Species will be planted in appropriate seasons to reduce risk of hazard impact. • Ensuring diversity in selected seeds and crops will reduce this risk.
9.	Trees and other species planted by the project are cut down by the communities for fuelwood.	Medium	<ul style="list-style-type: none"> • Community involvement and awareness raising will be undertaken to avoid this risk. • Species chosen for planting will be beneficial as fruiting trees rather than as fuelwood.

C. Environmental and social risk management

As outlined in Part II: K on the environmental and social principles included in project design, the proposed project activities are unlikely to result in significant negative social and environmental impacts. Most impacts are likely to occur during the construction phase of EbA interventions. These impacts are likely to be minor and without long-term adverse effects.

Despite the positive impacts that project activities will bring into effect for communities and ecosystems within the KRB, some environmental and social risks could be triggered according to the AF E&S and the UNDP SESP. An evaluation of the project against each of the AF principles was conducted in preparation of the SESP Report and is illustrated in [Table 12](#) under Part II: K²⁹⁸.

The SESP Report will serve to guide all aspects of project implementation. It will be the responsibility of the PSC to ensure that the appropriate risk mitigation measures are implemented during project implementation. Based on the results of the SESP, risk mitigation strategies for the relevant AF E&S Principles have been developed. These are detailed below. For details on the grievance mechanism outlined for the project, refer to Annex 4.

Principle 1. Compliance with the Law.

During the development of the Full Proposal, all relevant stakeholders were consulted to ensure that the all legal requirements were met. The project is therefore well-aligned and complies with national and sub-national policies, laws, plans and priorities for sustainable development and climate change adaptation in the KRB. See Part II: D and E for a full description of this alignment and compliance.

Principle 2. Access and Equity.

To ensure full implementation and adherence to this principle, project activities are designed to provide equal and accessible benefits to communities in the most vulnerable areas of the KRB. The identification of vulnerable districts was done through a fair and transparent process using the ongoing studies and assessments being conducted across the country as well as in the KRB.

During the implementation of EbA interventions under Component 2, local government authorities at each selected site will ensure that all project activities will not reduce or prevent communities from accessing basic rights. These rights include health services, clean water and sanitation, energy, education, housing, safe and decent working conditions and land rights. All community institutions and individuals will be sensitised towards the approach of prioritising support to most vulnerable communities while ensuring benefits reach further communities. This will mitigate any inter-community conflicts that might arise as a result of focusing on the most vulnerable villages.

Principle 3. Marginalised and Vulnerable Groups.

To avoid social exclusion of marginalised communities, orientation/sensitisation will be conducted at both the *jamoat* and village level to ensure equal participation within project activities. Additional social impacts that may be realised will therefore not unjustly impact on marginalised and vulnerable groups.

However, a small risk remains that vulnerable and marginalised groups will have insufficient access to project activities, particularly the climate-smart agricultural techniques and EbA interventions under Component 2.

Principle 4. Human Rights.

Project preparation and implementation phases will follow a human-rights based approach. No activities are included in project design that are not in line with established international human rights. Moreover, the project will promote the basic human rights of access to food, water and information.

The project seeks to ensure that benefits of all activities are shared broadly in a non-discriminatory, equitable manner through participatory processes and transparent selection criteria. Extensive stakeholder consultations were held during

²⁹⁸ Part II: K includes a checklist for environmental and social principles for project design.

project preparation²⁹⁹. These consultations will continue throughout project implementation. Potential project-related concerns and/or grievances of local communities will be addressed through a grievance mechanism³⁰⁰.

Principle 5. Gender Equality and Women's Empowerment.

The project recognises the importance of gender equality, particularly equal rights, responsibilities, opportunities and access of women and youth in the climate change adaptation. Project activities include 50% proportionate gender consideration in all project interventions, with a specific focus on on-the-ground activities under Component 2. Therefore, the project is designed to promote gender equity.

Gender equality and women empowerment civil society organisations will be involved to support the project. This will ensure adherence of all project activities to the gender equality and women empowerment. Despite the inclusion of gender considerations in the design of the project, there remains the low risk that project interventions will not benefit men and women equally.

Principle 6. Core Labour Rights.

The Government of Tajikistan (GoT) has ratified the eight core International Labour Organisation (ILO) Conventions. National and regional stakeholders were involved during the design stage of the project to ensure core labour rights have been respected and considered during the design stage. Compliance with all labour rights will be ensured in all project activities through the involvement of labour officers in target villages.

Component 2 will involve labour for the implementation of EbA interventions, where community members will provide the labour. All of the labour involved will be on daily wages where the wages will be determined according to tasks. Wage rate will be calculated on the basis of prevailing minimum wage rate for the assigned task. The record of work done for labour engaged will have to be maintained and the wages paid accordingly. Hours of work and the timing of the hours will be determined in consultation with the labour provided and the prevailing practices in the area.

Positive discrimination in favour of women may be used to provide fair and equal opportunity to women to seek employment as labour. All forms of negative discrimination in respect of employment and occupation will be eliminated. The project will not engage in child labour in any of its activities or interventions. All forms of forced or compulsory labour will be eliminated.

Under Component 2, local community members may be exposed to the risk of accidents while implementing EbA interventions. In addition, there is a low risk of child labour outside the limits of the law.

Principle 7. Indigenous Peoples.

There risks of inequitable access of indigenous peoples to the project's resources are not foreseen at this stage of project proposal. Project activities have been designed in accordance with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples. In addition, activities are aligned with all other applicable national and international instruments relating to indigenous people in Tajikistan.

Principle 9. Protection of Natural Habitats.

By implementing EbA activities, the project promotes the improved management of natural landscapes. The project is therefore likely to result in the improved protection of natural habitats rather than having any negative effect. Moreover, the project will consult and involve responsible officers and community representatives at district and village level to ensure this principle is adhered.

Despite this focus on improving ecosystem goods and services, there is a low risk that the construction of EbA interventions could result in the destruction of small areas of natural habitat.

Principle 10. Conservation of Biological Diversity.

By implementing EbA activities, the project promotes the improved management of natural habitats. Therefore, the project is likely to result in the improved protection of natural habitats and biodiversity.

²⁹⁹ See Annex 1 for a consolidated mission and stakeholder consultation report.

³⁰⁰ See Annex 5 which details the grievance mechanism outlined for the project.

Despite this focus on improving ecosystem goods and services, there is a low risk that the construction of EbA interventions could result in negative impacts on biodiversity.

Principle 11. Climate Change.

The project will contribute to climate change adaptation efforts in Tajikistan. Through Component 2, the project is designed to improve the delivery of climate information to all government-level decision-makers. Through this improved delivery of information and the enhanced governance coordination included under Component 1, the project addresses climate change adaptation planning.

The project is designed to: i) transfer technology to promote climate change adaptation to local communities to reduce their vulnerability to climate change; and ii) promote the development of innovative, community-based projects to increase resilience to climate change. Therefore, the project will enhance the local-level capacity of local communities to adapt to climate change. The project's climate change interventions focus on EbA activities and none of these interventions are likely to result in an increase in greenhouse gas emissions.

Principle 12. Pollution prevention and Resource Efficiency.

The project will not require (during or after implementation) significant amounts of water, energy, materials or other natural resources. It is also highly unlikely that project activities will result in the production of significant quantities of wastes, especially of hazardous or toxic wastes. The project will not produce significant volumes of effluents or air pollutants, including greenhouse gases. All applicable international standards will be met for maximising material resource use and minimising the production of wastes and the release of pollutants.

Principle 13. Public Health.

None of the project activities are envisioned to impact negatively on public health. Instead, the project will have positive impacts on health. In particular, through activities in Component 2, reduced nutrient runoff into KRB rivers and its tributaries will increase water quality and improve public health.

Principle 14. Physical and Cultural Heritage.

The EbA interventions to be implemented by the project are relatively small-scale and unlikely to result in the alteration, damage or removal of any physical or cultural heritage.

Principle 15. Lands and Soil Conservation.

The project will promote the conservation of soil and land resources. Specifically, through the implementation of EbA activities in Component 2 – including agroforestry – soil stability will be increased, the runoff of nutrients from topsoil will be reduced, and the fertility of soil at target sites will be increased.

D. Monitoring and evaluation

Monitoring and evaluation (M&E) will be applied in accordance with the established UNDP procedures throughout the project lifetime and will be developed in detail in the Full Proposal. The executing entity, together with the UNDP Country Office, will ensure the timeliness and quality delivery of the project implementation.

Audit: The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.

Project start

A project Inception Workshop (IW) will be held within the first three months of the project start date with those stakeholders with assigned roles in the project management, namely representatives from the Adaptation Fund (AF), UNDP Country Office and other stakeholders where appropriate. The IW is crucial to building ownership for the project results and to plan the first-year annual work plan (AWP).

Mid-term Review

The project will undergo an independent Midterm Review (MTR) at the mid-point of implementation. The evaluation will focus on the effectiveness, efficiency and timeliness of the implementation of project activities. Furthermore, the MTR will highlight issues requiring decisions and actions and will present initial lessons learned about project design, implementation and management.

Project closure

An independent Final Evaluation will be undertaken three months prior to the final PSC meeting. The final evaluation will focus on the delivery of the project's results as initially planned and as corrected after the MTR.

Monitoring procedure

UNDP Tajikistan and CEP will be responsible for monitoring and evaluation (M&E) of the proposed project and for project output monitoring in line with the M&E policies and procedures. The M&E system will be governed by the following outlined principles.

- **Accountability:** ability of UNDP to be answerable to donors and to the beneficiaries through availability of specific, timely and relevant data.
- **Evidence-base:** readily available information to support the development of more appropriate and improved programmes in future.
- **Learning:** use of simplified and frequent reporting to support reflection, learning and sharing of good practices and solutions.
- **Transparency:** sharing of information with all of UNDP's stakeholders, including strategies, plans, budgets and reports to promote openness.

The project management team will produce the following deliverables for M&E throughout project implementation.

- An Issue Log shall be activated in ATLAS and updated by the PM to facilitate tracking and resolution of potential problems or requests for change.
- Based on the initial risk analysis submitted (see Annex 4³⁰¹), a risk log shall be activated in ATLAS and regularly updated by reviewing the external environment that may affect project implementation.
- Based on information recorded in ATLAS, a Project Progress Report (PPR) shall be submitted by the PM to the PSC, using the standard report format.
- A project lesson learned log shall be activated and regularly updated to ensure ongoing learning and adaptation within the organisation, and to facilitate the preparation of the lessons learned report at the end of the project.
- A Monitoring Schedule Plan shall be activated in ATLAS and updated to track key management actions and events.
- **Annual Review Report.** An Annual Review Report shall be prepared by the Project Manager and shared with the PSC. As a minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the PR covering the whole year with updated information for each above element of the PR as well as a summary of results achieved against pre-defined annual targets at the output level.
- **Annual Project Review.** Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. This review is driven by the PSC and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcomes.

Together with UNDP, the PSC will carry out two independent external evaluations as follows.

- **Mid-Term Evaluation (MTE).** The MTE will be carried out in the 6th quarter of the programme implementation and will be independent and external. The evaluation will engage all programme stakeholders and will assess the extent to which progress is being made towards the outputs and their alignment with outcomes. The evaluation may propose mid-course corrective measures and may reassess the objectives and revise implementation strategy.
- **Terminal Review (TR).** The TR will be conducted at the conclusion of the programme. UNDP will commission a full external evaluation assessing the accomplishment of objectives.

Table 14 and 15 outlined the monitoring and evaluation plan, respectively. These outlines include the purpose of each M&E activity and the respective complementary actions.

Table 14. Monitoring plan for the proposed project including frequency and expected action(s).

Monitoring activity	Purpose	Frequency	Expected action(s)
Track results progress	Progress data against the results indicators in the RRF will be collected and analysed to assess the progress of the	Quarterly, or in the frequency	Slower than expected progress will be addressed by project

³⁰¹ Annex 4 includes the detailed Environmental and Social Management Framework (ESMF) for the project.

Monitoring activity	Purpose	Frequency	Expected action(s)
	project in achieving the agreed outputs.	required for each indicator.	management.
Monitor and Manage Risk	Identify specific risks that may threaten achievement of intended results. Identify and monitor risk management actions using a risk log. This includes monitoring measures and plans that may have been required as per UNDP's Social and Environmental Standards. Audits will be conducted in accordance with UNDP's audit policy to manage financial risk.	Quarterly	Risks are identified by project management and actions are taken to manage risk. The risk log is actively maintained to keep track of identified risks and actions taken.
Learn	Knowledge, good practices and lessons will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project.	At least annually	Relevant lessons are captured by the project team and used to inform management decisions.
Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project.	Annually	Areas of strength and weakness will be reviewed by project management and used to inform decisions to improve project performance.
Review and Make Course Corrections	Internal review of data and evidence from all monitoring actions to inform decision making.	At least annually	Performance data, risks, lessons and quality will be discussed by the PSC and used to make course corrections.
Project Report	A progress report will be presented to the PSC and key stakeholders, consisting of progress data showing the results achieved against pre-defined annual targets at the output level, the annual project quality rating summary, an updated risk log with mitigation measures, and any evaluation or review reports prepared over the period.	Semi-annually, and at the end of the project (final report)	
Project Review/ Project Steering Committee (PSC)	The project's governance mechanism (i.e., the PSC) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the PSC shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences.	Semi-annually	Any quality concerns or slower than expected progress should be discussed by the PSC and management actions agreed to address the issues identified.

Table 15. Evaluation plan for the proposed project including stakeholders and planned date of completion.

Evaluation activity	Planned completion date	Stakeholders
Mid-term Review (MTR)	August 2022	CEP; MEWR
Terminal Review (TR)	March 2023	CEP; MEWR

The respective costs for M&E are outlined in Table 16 according to the type of M&E activity.

Table 16. Monitoring and evaluation costs of the proposed project.

Type of M&E activity	Responsible parties	Budget (147,160 US\$)	Timeframe
Direct Project Monitoring and Quality Assurance including progress and financial reporting, project revisions, technical assistance and risk management	<ul style="list-style-type: none"> Project Manager Project team UNDP External consultants – i.e. evaluation team 	(supported from staff costs included in Project execution, and from MIE fee)	Quarterly, half-yearly and annually, as needed
Evaluations (Mid-term Evaluation and Terminal Review)	<ul style="list-style-type: none"> Project Manager Project team UNDP 	56,000	At midpoint and at end of project implementation
Audit	<ul style="list-style-type: none"> Project Manager 	5,000	Annually, at year end

Type of M&E activity	Responsible parties	Budget (147,160 US\$)	Timeframe
	<ul style="list-style-type: none"> • Project team • UNDP 		
Inception meeting, field visits and steering committee meetings	<ul style="list-style-type: none"> • Project Manager • Project team • UNDP 	86,160	Inception meeting within first two months and bi-annual PSC meetings (and sub-committee meetings)
TOTAL indicative cost		147,160	

Note: Above costs do not cover UNDP staff time. All UNDP staff costs associated with M&E are covered by the MIE Fee

E. Results framework

Table 17. Results framework for the proposed project outlining the indicators, targets, assumptions and sources of verification of the outcomes and outputs against the baseline.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
Outcome 1. Catchment management strategy to manage climate risks operationalised at <i>raion</i> (district) and <i>jamoat</i> (sub-district) levels in Kofirnighan River Basin (KRB).	Number of staff trained to respond to impacts of climate-related events (gender disaggregated).	0	By the end of the project, at least 30 staff (of which at least 30% are women) trained on integrated catchment management. By the end of the project, at least 100 staff (of which at least 30% are women) trained on integrated catchment management.	<ul style="list-style-type: none"> Attendance registers from training workshops Workshop reports Interviews with selected staff members of relevant ministries 	Training workshops provide staff with the capacity to integrate climate resilience into integrated catchment management.
Output 1.1. Multi-hazard climate risk models (MHCRMs) developed for target watersheds in the KRB.	Number of risk models developed.	0	Gap analysis conducted for KRB that details climate risks for all watersheds. By the end of the project, at least one MHCRM developed for each watershed in the KRB (and each target district).	<ul style="list-style-type: none"> Gap analysis MHCRMs that detail climate risks for each watershed and target district Results of studies including data and GIS information 	Gap analysis and MHCRMs will inform the selection of vulnerable sites in the target districts as well as the identification of appropriate EbA interventions.
Output 1.2. Providing support for establishing automated weather stations in KRB sub-catchments to provide data for refining the multi-hazard climate models [developed under Output 1.1].	Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis.	Currently, weather stations do not provide up-to-date and relevant information in a timely manner to inform climate risks. There is limited delivery of climate information to local communities.	Policy- and decision-makers in KRB receive forecasts from Hydromet. By the end of the project, policy- and decision-makers in KRB receive forecasts and downscaled national climate information every quarter from Hydromet. By the end of the project, local communities in the project interventions sites receive tailored climate	<ul style="list-style-type: none"> Climate information packages Interviews with government and local communities 	Existing climate information producers are committed to participating in the development and implementation of forecasts and area-specific advisories.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
			information packages.		
Output 1.3. Integrated catchment management strategy developed for the KRB.	Integrated catchment management strategy developed. Number of staff trained (gender disaggregated). Number of community members trained (gender disaggregated).	0	By year 3 of the project, at least 30 staff (of which at least 30% are women) trained on integrated catchment management across all target departments. By the end of the project, at least 100 staff (of which at least 30% are women) trained on integrated catchment management across all target departments. At least 100 community members in each district (of which 30% are women) trained on identification of suitable EbA interventions (600 people in total).	<ul style="list-style-type: none"> • Project reports • Monitoring and evaluation reports per intervention site • Reports on community consultations, trainings and surveys • Reports on site/field visits 	<p>Training workshops provide staff with the capacity to integrate climate resilience into integrated catchment management.</p> <p>All communities surrounding project intervention sites are committed to participating in project activities, taking up/adopting climate resilient techniques and practices and providing training to other officers/community members.</p>
Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	Number of interactions between relevant stakeholders	0	By the end of the project, at least 2 meetings are held per year between different government sectors, RBOs, district authorities etc.	<ul style="list-style-type: none"> • Meeting reports • Monitoring and evaluation reports • Annual workplans • Meeting minutes and reports 	Institutions, government ministries and agencies are committed to participating in and addressing climate risks, with integrated catchment management central to the adaptation pathway for KRB.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
Output 1.5. Payment for Ecosystem Services (PES) models to support the long-term financing of integrated catchment management strategy implementation.	Number of PES models developed for the KRB	0	By the end of the project, at least 1 PES model developed and at least one policy brief submitted to government detailing the model.	<ul style="list-style-type: none"> • Policy brief on PES model • Meeting reports • Monitoring and evaluation reports 	Institutions, government ministries and agencies are committed to participating in and addressing climate risks, with integrated catchment management central to the adaptation pathway for KRB.
Outcome 2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	Number of people practising climate change adaptation technologies (gender disaggregated). Total number of men and women benefitting from reduced vulnerability to climate change	0	At least 600 people (100 per district), of which at least 30% will be women, are implementing EbA interventions for climate risk management. At least 46,000 people in ~100 villages across 6 districts benefitting from reduced vulnerability to climate change	<ul style="list-style-type: none"> • Registers of project beneficiaries at each site • Site visits • Community surveys. 	Community members continue to practice adaptation technologies once they have been trained and provided with the necessary equipment.
Output 2.1. Agro-ecological extension services supported at the <i>jamoat</i> level to provide technical support for EbA implementation.	Number of extension service providers trained.	0	At least 1 private extension service provider in each target KRB district supported	<ul style="list-style-type: none"> • Annual workplans • Workshop reports • Monitoring and evaluation reports 	All communities surrounding project intervention sites are committed to participating in project activities, taking up/adopting climate-resilient EbA techniques and practices and providing training to other community members.
Output 2.2. Watershed Action Plans (WAPs) developed that promote climate resilience and enhance economic productivity for target communities.	Number of WAPs developed.	0	By the end of the project, at least 1 WAP developed in each of the 14 target <i>jamoats</i> .	<ul style="list-style-type: none"> • Annual workplans developed for the WAPs • Monitoring and evaluation reports 	None of the <i>jamoats</i> have overlapping watersheds in the project area.
	Number of hectares of land with EbA activities implemented at project	0	At least 250 ha of land in each district undergoing EbA implementation	<ul style="list-style-type: none"> • Monitoring and evaluation reports per intervention site • Reports on community 	All communities surrounding project intervention sites are committed to participating in

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
	sites in each district		(1,500 ha in total).	consultations/trainings and field visits • GIS	project activities and taking up/adopting climate-resilient techniques and practices.
Outcome 3. Existing knowledge management platforms supported for integrated catchment management and EbA.	Knowledge management centre strengthened through the support of project activities	0	By the end of the project at least 1 knowledge centre has been strengthened.	• Reports and training materials • Monitoring and evaluation reports	Strengthening existing knowledge management centres promotes local knowledge sharing and raises awareness among communities.
Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	Existing knowledge centre/ platforms/ hubs in Tajikistan are supported and include information and data on KRB and specifically climate risk information.	Climate change research is not coordinated within the KRB and across Tajikistan. Knowledge generated through projects is not collated, shared or disseminated.	By the end of the project at least 1 knowledge centre has been strengthened.	• Meeting/workshop reports • Minutes from forum meetings	All representatives involved in the knowledge centres (public institutions, NGOs and resource users etc.) are dedicated to developing, adopting and implementing interdisciplinary approaches to climate resilient EbA techniques and practices for integrated catchment management in the KRB specifically.
Output 3.2. An impact evaluation framework (IEF) to enable effective adaptive management of EbA activities.	Evaluation of EbA interventions in target sites conducted.	Several projects have undertaken activities on climate change adaptation within Tajikistan. However, none of these activities have been evaluated according to their impacts for communities.	By the end of the project, an IEF will be developed that details the process of evaluating the impact of implemented EbA measures on communities.	• Site visits • Data collection • Community consultation • Data analysis of EbA impacts	Community members will be more aware of EbA interventions in and surrounding their communities. By conducting the IEF, awareness on the benefits of EbA interventions will be raised.

F. Alignment with Adaptation Fund Results Framework

Table 18. Project alignment with the Adaptation Fund Results Framework including Outcome and Output Indicators.

Project Objective(s) ³⁰²	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (US\$)
Reduce vulnerability and enhance climate-resilience of small-scale farmers and pastoralists in Tajikistan to respond to the impacts of climate change.	Total number of men and women benefitting from reduced vulnerability to climate change Percentage population of the KRB benefitting from project interventions. Expected: ~5%	Outcome 2. Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks 2.2. Number of people with reduced risk to extreme weather events	9,996,441
		Outcome 3. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.2. Modification of behaviour in targeted population	
		Outcome 5. Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	
		Outcome 6. Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1. Percentage of households and communities having more secure (increased) access to livelihood assets 6.2. Percentage of targeted population with sustained climate-resilient livelihoods	
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (US\$)
Outcome 1. Catchment management strategy to manage climate risks operationalised at <i>raion</i> (district) and <i>jamoat</i> (sub-district) levels in Kofirnighan River Basin (KRB).	Number of staff trained to respond to impacts of climate-related events (gender disaggregated)	Output 2.2. Targeted population groups covered by adequate risk reduction systems	2.1.2. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased 2.2.1. Percentage of population covered by adequate risk reduction systems	1,012,000

³⁰² The AF utilised OECD/DAC terminology for its results framework. Project proponents may use different terminology, but the overall principle should still apply.

Outcome 2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	Number of people practising climate change adaptation technologies (gender disaggregated).	Output 5. Vulnerable physical, natural and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	7,282,810
	Number of hectares of land with EbA activities implemented at project sites in each district	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1. No. and type of adaptation assets (physical as well as knowledge) created in support of individual or community-livelihood strategies	
Outcome 3. Existing knowledge management platforms supported for integrated catchment management and EbA.	Knowledge management centre strengthened through the support of project activities	Output 3. Targeted population groups participating in adaptation and risk reduction awareness activities	3.1.1. No. and type of risk reduction actions or strategies introduced at local level	142,500

Table 19. Adaptation Fund Core Indicators: i) number of beneficiaries; ii) increased income, or avoided decrease in income; and iii) natural assets protected or rehabilitated.

Adaptation Fund Core Impact Indicators				
Date of Report	3 September 2018			
Project Title	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan			
Country	Tajikistan			
Implementing Agency	UNDP			
Project Duration	5 years			
Adaptation Fund Core Impact Indicator “Number of Beneficiaries”				
	Baseline (<i>absolute number</i>)	Target at project approval (<i>absolute number</i>)	Adjusted target first year of implementation (<i>absolute number</i>)	Actual at completion ³⁰³ (<i>absolute number</i>)
Direct beneficiaries supported by the project	0	46,000		
<i>Female direct beneficiaries</i>	0	25,000		
<i>Youth direct beneficiaries</i>	0	Unknown		
Indirect beneficiaries supported by the project	0	828,000		
<i>Female indirect beneficiaries</i>	0	409,612 ^{304,305}		
<i>Youth indirect beneficiaries</i>	0	Unknown		
Adaptation Fund Impact Indicator “Increased income, or avoided decrease in income”				

³⁰³ At project completion, the proponent could report on % targeted population reached or successfully supported (the absolute numbers could then be deduced from that figure).

³⁰⁴ In 2016, 49.76% of Tajikistan’s total population was female

³⁰⁵ Trading Economics. Tajikistan - Population, female (% of total). Accessed 31 August 2018.

	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Income Source ³⁰⁶ (name)	Livestock, crops (fodder, food), fuelwood	Livestock, crops (fodder, food), fuelwood		
Income Source				
Income level (USD)	unknown	unknown		
Number of households (total number in the project area) (report for each project component)	unknown	600 (component 2.0)		
Adaptation Fund Core Impact Indicator “Natural Assets Protected or Rehabilitated”				
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion ³⁰⁷
Natural Asset or Ecosystem (type)	Degraded ecosystems (forest, rangeland, river and drainage line)	Conserved or rehabilitated ecosystems (forest, rangeland, river and drainage line)		
Change in state Ha or km Protected/rehabilitated, or Effectiveness of protection/rehabilitation - Scale (1-5)	0 ha Scale 1 (not improved)	At least 1,500 ha Scale 3 (moderately improved)		
Total number of natural assets or ecosystems protected/rehabilitated	0 ha	At least 1,500 ha		

³⁰⁶ When the numbers of livelihoods go through significant changes, such as when sources of income are diversified, it may be useful to illustrate the changes by primary livelihoods.

³⁰⁷ At project completion, the proponent could report on % targeted population reached or successfully supported (the absolute numbers could then be deduced from that figure).

G. Workplan and Budget

WORKPLAN

The tentative workplan for the proposed project is presented in the table below. This workplan indicates the proposed duration for activities under each output, as well as the expected year in which the output is expected to be delivered.

Components and Outputs		Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1. Integrated catchment management to build climate resilience.	Output 1.1. Multi-hazard climate risk models developed for vulnerable watersheds in the Kofirnighan River Basin.	■	■	■	■	■	■	■	■												
	Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.	■	■	■	■																
	Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.	■	■	■	■	■	■	■	■												
	Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	■	■	■	■	■	■	■	■												
	Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.									■	■	■	■	■	■	■	■				
Component 2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in	Output 2.1. Agro-ecological extension services supported at the <i>jamoat</i> level to provide technical support for EbA implementation.					■	■	■	■	■	■	■	■	■	■	■	■	■	■		
	Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance	■	■	■	■	■	■	■	■	■											

agro-ecological landscapes.	economic productivity for target communities.																					
	Output 2.3. EbA interventions implemented in target watersheds by local communities.																					
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin.	Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.																					
	Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.																					

BUDGET

Award ID	00113350			Project ID	00111538								
Project Title	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan												
Business Unit	TJK10												
PIMS No.	PIMS 6219												
Implementing Partner	Committee for Environmental Protection (CEP)												
Outcome/ Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Don or Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget Notes	
Component 1. Integrated	UNDP/CEP	62040	AF	71200	International consultant	83,500	69,000	-	-	-	152,500	1	

catchment management to build climate resilience.				71300	Local consultant	81,000	74,000	30,000	-	-	185,000	2
				71600	Travel	10,000	10,000	10,000	10,000	-	40,000	3
				72100	Contractual Services-Companies	40,000	-	10,000	10,000	10,000	70,000	5
				72300	Materials & Goods	70,000	70,000	70,000	-	-	210,000	7
				72400	Audio Visual&Print Prod Costs	-	15,000	5,000	5,000	5,000	30,000	6
				74500	Miscellaneous Expenses	20,000	10,000	10,000	10,000	10,500	60,500	8
				75700	Training, Workshops and Confer	98,000	88,000	63,000	15,000	-	264,000	4
					Total Outcome 1	402,500	336,000	198,000	50,000	25,500	1,012,000	
Component 2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.	UNDP/C EP			71300	Local consultant	-	100,000	-	-	-	100,000	2
				71400	Contractual Services - Individ	36,000	36,000	36,000	36,000	36,000	180,000	10
				71600	Travel	15,000	15,000	15,000	14,000	15,000	74,000	3
				72100	Contractual Services-Companies	-	3,358,000	2,123,500	1,123,500	123,500	6,728,500	5
				74200	Audio Visual&Print Prod Costs	-	24,310	-	-	-	24,310	9
				75700	Training, Workshops and Confer	20,000	75,000	48,000	18,000	15,000	176,000	4
					Total Outcome 2	71,000	3,608,310	2,222,500	1,191,500	189,500	7,282,810	
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.	UNDP/C EP	62040	AF	71200	International consultant	36,500	-	-	-	-	36,500	1
				71600	Travel	1,000	1,000	1,000	1,000	1,000	5,000	3
				72100	Contractual Services-Companies	20,000	20,000	12,000	19,000	20,000	91,000	5
				74500	Miscellaneous Expenses	10,000	-	-	-	-	10,000	8
					Total Outcome 3	67,500	21,000	13,000	20,000	21,000	142,500	
Project Execution Cost	UNDP	62040	AF	71400	Contractual Services - Individ	85,000	85,000	85,000	85,000	85,000	425,000	10

				71600	Travel	7,000	7,000	7,000	7,000	7,000	35,000	3
				72200	Equipment and Furniture	60,000	-	-	-	-	60,000	14
				72400	Communic & Audio Visual Equip	2,500	2,500	2,500	2,500	2,500	12,500	11
				73100	Rental & Maintenance-Premises	5,000	5,000	5,000	5,000	5,000	25,000	12
				73400	Rental & Maint of Other Equip	5,000	5,000	5,000	5,000	2,500	22,500	15
				74100	Professional Services	1,000	1,000	29,000	1,000	29,000	61,000	13
				74596	Direct project cost	17,000	36,000	43,000	26,000	10,000	132,000	16
				75700	Training, Workshops and Confer	3,000	-	-	-	-	3,000	4
				Total project execution cost		185,500	141,500	176,500	131,500	141,000	776,000	1
Implementing Entity Fee (8.5%)						350,304	209,447	133,110	71,043	19,227	783,131	
Total Project Costs						1,076,804	4,316,257	2,743,110	1,464,043	396,227	9,996,441	1

Budget note number	Budget Notes
1	<p>International consultant (daily fee of US\$650 * 50 days + US\$4,000 air fare) for Multi-Hazard Climate Risk Modeling;</p> <p>International consultant (IT expert - daily fee of US\$650 * 30 days + US\$4,000 air fare) for collecting and collating data;</p> <p>International Consultant (Catchment management expert - daily fee of US\$650 for 100 days + US\$4,000 air fare) on climate strategy;</p> <p>International Consultant (Training expert on integrated catchment management, daily fee of US\$ 650 for 30 days + US\$ 4,000 air fare) to develop a Training programme on integrated catchment management;</p> <p>International consultant (US\$650 * 50 days + US\$4,000 air fare) for development of an evaluation framework</p>
2	<p>National consultant to conduct gap analyses (US\$200*125 days)</p> <p>National consultants to support development of Multi-Hazard Climate Risk Models (US\$200*100 days)</p> <p>National consultants to support data collection and collation (US\$200*50 days)</p> <p>National consultants to support trainings of local community members to receive advisories (US\$200*150 days)</p> <p>National consultants to support the development of the climate strategy (2pers* US\$200*100 days)</p> <p>National consultants to assist international consultants in conducting training programme on integrated catchment management and to continue training workshops in Year 2 (US\$200*100 days)</p> <p>National Environmental Economist and National Policy Expert, for development of PES models (2 pers.*US\$200*100 days)</p> <p>National Watershed Expert for participatory mapping (US\$200 for 150 days)</p> <p>National Communications Expert for participatory mapping (US\$200 for 150 days)</p> <p>National consultants on WAPs development (2pers.*US\$200*100days)</p>
3	Travel to target districts

4	Workshops (10 district-level workshops and 3 national-level workshops) on climate strategy; - \$25,000 Training workshops (6 3-day workshops @US\$5,000 per workshop) on integrated catchment management + training materials - \$50,000; Training materials, trainings (assume US\$10,000 for training materials, 2 trainings per year per jamoat at US\$1,000 per training); - \$94,000 Workshops for RBOs, RBCs, districts and jamoats. Assume 1 workshop in each district + 2 workshops in Dushanbe on strengthening the coordination systems - \$50,000 Workshops for CEP and other relevant government staff on integrating EbA in catchment management - \$20,000 Workshops at district and national level (12 district-level workshop, 3 national-level workshops) on PES model development - \$55,000 Training for EbA and FFS service providers - \$91,000 Community meetings (Meetings to be held across multiple villages; assume 3 meetings per jamoat, US\$500 per meeting) on participatory mapping - \$21,000 Workshop per jamoat on developing community monitoring plans - \$20,000 + Inception workshop - \$3,000 Training for Nursery staff - \$14,000
5	Contractual Services for GIS multihazard climate risk data modeling for first year - \$40,000. Contract for disseminating regular advisories via SMS - \$30,000 Contractual services for civil works / Contract for knowledge management centre - database maintenance, knowledge dissemination - \$91,000 EbA demonstration plots for villages – 100 villages, US\$3,000 per plot to be established, plus US\$200 for upkeep for each EbA plot per annum * 3 years - \$360,000 14 nurseries, US\$10,000 to establish each nursery and US\$973.22 upkeep for each nursery per annum * 4 years - \$194,500 Inputs for 100 villages to implement EbA - estimated US\$58,140 per village - \$5,814,000 Farmer field schools - 100 villages, assume US\$900 per field school per annum - \$360,000
6	Basic phones + airtime for 100 community representatives;
7	Materials and inputs for 3 AWS Stations (US\$70,000 per station * 3 stations) - \$210,000
8	Miscellaneous Expenses (including bank charges, insurance);
9	Printing of mapping materials (\$2,310) + printing & miscellaneous (\$10,000) + translation services (\$12,000)
10	All project personnel fees (Project Manager, Administrative/Finance Assistant, Field staff (3 @ US7,000 p.a.) Programme Assistant, Project Analyst, Project Engineer)
11	Communication cost (internet, mobile and landline phones);
12	Office rent
13	Mid-term review of the project by team of consultants (28,000 USD); Final review of the project by team of consultants (28,000 USD); Audit Fees (5,000 USD)
14	Procurement of vehicle for visits to target districts for implementation of project activities;
15	All cost associated with vehicle running, like regular maintenance, etc.;
16	Expenditures for the services on HR, procurement, IT, security provided by CO.

Annual expenditure per output						
Output	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Output 1.1. Multi-hazard climate risk models developed for vulnerable watersheds in the Kofirnighan River Basin.	\$ 111,500	\$ 10,000	\$ -	\$ -	\$ -	\$ 121,500
Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.	\$ 133,500	\$ 105,000	\$ 105,000	\$ 25,000	\$ 25,500	\$ 394,000

Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.	\$ 92,500	\$ 156,000	\$ 58,000	\$ 15,000	\$ -	\$ 321,500
Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	\$ 35,000	\$ 10,000	\$ 25,000	\$ -	\$ -	\$ 70,000
Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.	\$ 30,000	\$ 55,000	\$ 10,000	\$ 10,000	\$ -	\$ 105,000
Output 2.1. Agro-ecological extension services supported at the <i>jamoat</i> level to provide technical support for EbA implementation.	\$ -	\$ 390,000	\$ 140,000	\$ 110,000	\$ 110,000	\$ 750,000
Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities.	\$ 36,000	\$ 181,310	\$ 36,000	\$ 36,000	\$ 36,000	\$ 325,310
Output 2.3. EbA interventions implemented in target watersheds by local communities.	\$ 35,000	\$ 3,037,000	\$ 2,046,500	\$ 1,045,500	\$ 43,500	\$ 6,207,500
Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	\$ 20,000	\$ 20,000	\$ 12,000	\$ 19,000	\$ 20,000	\$ 91,000
Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.	\$ 47,500	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 51,500
PMC	\$ 185,500	\$ 141,500	\$ 176,500	\$ 131,500	\$ 141,000	\$ 776,000
Implementing Entity Fee (8.5%)	\$ 350,304	\$ 209,447	\$ 133,110	\$ 71,043	\$ 19,227	\$ 783,131
					Grand Total:	\$ 9,996,441

Annual expenditure by activity						
Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1.1.1. Conduct a gap analysis on existing risk information in	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ 25,000

the Kofirnighan River Basin.						
1.1.2. Develop Multi-Hazard Climate Risk Models for the Kofirnighan River Basin.	\$ 86,500	\$ 10,000	\$ -	\$ -	\$ -	\$ 96,500
1.2.1. Provide technical support for the modernisation of automated weather stations in the most vulnerable districts of the Kofirnighan River Basin.	\$ 90,000	\$ 80,000	\$ 80,000	\$ 10,000	\$ 10,500	\$ 270,500
1.2.2. Collect and collate data from improved automated weather stations.	\$ 33,500	\$ -	\$ -	\$ -	\$ -	\$ 33,500
1.2.3. Use collected data to inform climate risk information and adaptation advisories for agro ecological extension service providers.	\$ 10,000	\$ 25,000	\$ 25,000	\$ 15,000	\$ 15,000	\$ 90,000
1.3.1. Develop an integrated catchment management strategy for the Kofirnighan River Basin to inform and facilitate cross-sectoral landscape planning.	\$ -	\$ 89,000	\$ 30,000	\$ 15,000	\$ -	\$ 134,000
1.3.2. Deliver a training programme on mainstreaming climate risks for integrated catchment management planning.	\$ 54,500	\$ 39,000	\$ -	\$ -	\$ -	\$ 93,500
1.3.3. Provide training for selected communities on identification of EbA activities and implementation.	\$ 38,000	\$ 28,000	\$ 28,000	\$ -	\$ -	\$ 94,000
1.4.1. Strengthen existing training mechanisms at the raion and jamoat levels.	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ -	\$ 50,000
1.4.2. Provide training on integrating EbA into catchment management.	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	\$ 20,000
1.5.1. Develop suitable Payment for Ecosystem Services models for the KRB.	\$ 30,000	\$ 55,000	\$ 10,000	\$ 10,000	\$ -	\$ 105,000
2.1.1. Support agro-ecological extension services by training existing service providers on EbA, climate-resilient	\$ -	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000

agriculture and multi-hazard climate risk management.						
2.1.2. Establish EbA demonstration plots in each of the target villages.	\$ -	\$ 300,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 360,000
2.1.3. Conduct farmer field schools (FFs) in target villages making use of demonstration plots.	\$ -	\$ 90,000	\$ 90,000	\$ 90,000	\$ 90,000	\$ 360,000
2.2.1. Conduct participatory mapping at the watershed level.	\$ 36,000	\$ 119,310	\$ 36,000	\$ 36,000	\$ 36,000	\$ 263,310
2.2.2. Develop Watershed Action Plans (WAPs) for vulnerable watersheds in the Kofirnighan River Basin.	\$ -	\$ 62,000	\$ -	\$ -	\$ -	\$ 62,000
2.3.1. Support local communities to implement priority EbA interventions.	\$ -	\$ 2,982,000	\$ 2,013,500	\$ 1,013,500	\$ 13,500	\$ 6,022,500
2.3.2. Support local community members in developing Enterprise Plans (EPs) based on EbA interventions.	\$ 20,000	\$ 20,000	\$ 18,000	\$ 18,000	\$ 15,000	\$ 91,000
2.3.3. Monitor the impacts of EbA interventions.	\$ 15,000	\$ 35,000	\$ 15,000	\$ 14,000	\$ 15,000	\$ 94,000
3.1.1. Support existing knowledge management platforms responsible for collating, analysing and disseminating information on climate risks and suitable adaptation options.	\$ 20,000	\$ 20,000	\$ 12,000	\$ 19,000	\$ 20,000	\$ 91,000
3.1.2. Collect and collate data and information from automated weather stations, agro ecological extension centres and international publications.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2.1. Establish an impact evaluation framework to enable the effective quantification of project benefits and to provide information for future planning and implementation of EbA interventions.	\$ 46,500	\$ -	\$ -	\$ -	\$ -	\$ 46,500

3.2.2. Obtain data and information through applying the framework will be disseminated via the knowledge platform(s).	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 5,000
PMC	\$ 185,500	\$ 141,500	\$ 176,500	\$ 131,500	\$ 141,000	\$ 776,000
Implementing Entity Fee (8.5%)	\$ 350,304	\$ 209,447	\$ 133,110	\$ 71,043	\$ 19,227	\$ 783,131
					Grand Total	\$ 9,996,441

H. Disbursement schedule

A disbursement schedule including budget distributed per year of project implementation is detailed below.

Table 20. Disbursement schedule including milestones.

	Upon agreement & signature (US\$)	After Year 1 (US\$)	After Year 2 (US\$)	After Year 3 (US\$)	After Year 4 (US\$)	Total disbursed (over 5 years)
Scheduled date (tentative)	1-Mar-2020	1-Mar-2021	1-Mar-2022	1-Mar-2023	1-Mar-2024	
Project funds	541,000	3,965,310	2,433,500	1,261,500	236,000	8,437,310
Project Execution Cost	185,500	141,500	176,500	131,500	141,000	776,000
Implementing Entity fee (8.5%)	350,304	209,447	133,110	71,043	19,227	783,131
					Total	9,996,441

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government³⁰⁸

A list of all endorsements for the project is provided in Table 22. See Annex 2 for all endorsement letters³⁰⁹.

Table 20. List of endorsements provided for the proposed project.

Khayrullo Ibodzoda – Chairman of the Committee for the Environmental Protection (CEP) under the Government of the Republic of Tajikistan	Date: January, 19, 2018
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B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project contact person’s name, telephone number and email address.

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project.



Pradeep Kurukulasuriya
 Executive Coordinator & Director- Global Environmental Finance
 & Lead, Natural Capital and the Environment
 Bureau for Policy and Programme Support (BPPS)/
 Global Policy Network
 United Nations Development Programme

Date: 15 April 2019	Tel and e-mail: pradeep.kurukulasuriya@undp.org
Project Contact Person: Ms. Keti Chachibaia	
Tel. And Email: keti.chachibaia@undp.org	

³⁰⁸ Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

³⁰⁹ Annex 2 includes endorsement letters from

LIST OF ANNEXURES

All annexures have been included as a separate attachment to the Full Proposal.

- Annex 1. Consolidated stakeholder consultations and missions report
- Annex 2. Endorsement letter
- Annex 3. Justification for selection of the Kofirnighan River Basin
- Annex 4. Environmental and Social Management Framework (ESMF)
- Annex 5. Hydromet list of needs for the repair and rehabilitation of weather stations
- Annex 6. UNDP Social and Environmental Screening Procedure (SESP)
- Annex 7. Letter of Agreement between UNDP and Government for the provision of Support Services
- Annex 8. UNDP Fees for Support to Adaptation Fund Project
- Annex 9. Cost-benefit analyses of proposed community-level interventions

End of Full Proposal



ADAPTATION FUND

ANNEXURES TO THE FULL PROPOSAL TITLED:

“An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan”

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<u>Annex 13.</u> Land Use&Climate Change-Pastures and Forests in KRB:	Submitted as separate file

Annex 1. CONSOLIDATED STAKEHOLDER CONSULTATIONS AND MISSIONS REPORT (SHORT VERSION)

CONSOLIDATED STAKEHOLDER CONSULTATIONS AND MISSIONS REPORT

Towards development of the Project Proposal –
“An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan”



TAJIKISTAN, 2018

I. INTRODUCTION

Tajikistan is a small landlocked country in the heart of Central Asia, bordered by Afghanistan, China, the Kyrgyz Republic, and Uzbekistan. Roughly one-tenth of its 7 million total population lives in Dushanbe, the capital city. The country has abundant water resources, contributing to its specialization in cotton production and a considerable hydropower generation potential. Only 7 percent of its total land area of 143,000 square kilometers is arable. High mountain ranges across its territory make communication between different parts of the country difficult, especially in winter. Tajikistan is highly susceptible to natural disasters, and is regularly affected by floods, landslides, and droughts. Up to 40 percent of the country's national workforce is employed abroad (mostly in Russia) and sends home remittances equal to more than one-third of its gross domestic product. However, with global financial crisis and economic downfall in Russia associated with sanctions the remittance incomes are already adversely affected. Preliminary forecasts from IMF and the World Bank suggest that remittance income will fall by more than the 31% fall in remittance income. Lastly, low agricultural productivity and rudimentary safety nets still leave those below the poverty line vulnerable to shocks and stresses, including women who have experienced lowered rates of poverty reduction than men. The above factors combine to make Tajikistan one of the poorest and most vulnerable economies in the world.

Unless urgent and timely action is taken, Tajikistan will suffer tremendously. It is in the context of this reality that Tajikistan's National Development Strategy until 2030 outlines hazard risk reduction along with adapting to climate change as critical for the country to achieve its long-term sustainable development goals and objectives. To give effect to this, Tajikistan has tapped into a number of funding sources and is implementing several related projects. In 2018, Tajikistan made a significant step towards advancing the climate change adaptation agenda by tapping into another such source with the endorsement of its Project Concept Note for Adaptation Fund Project. The endorsement paves the way for the development of the full project proposal, that will be undertaken by UNDP in Tajikistan in partnership with the Committee for Environmental Protection, under the project "Facilitating Climate Resilience in Tajikistan" funded by the Russian Trust Fund for Development.

II. PURPOSE

In September 2018, UNDP has developed a draft project proposal – "*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*" to the Adaptation Fund. Project development proceeded an extensive process beginning with a scoping mission from 1-7 March 2018, then continued with a validation mission from 11-22 June 2018 that also included site visits to vulnerable districts of Tajikistan's target river basin (Kafernigan). Those missions concluded with a Validation Workshop conducted on 22nd June 2018 in Dushanbe. The concluding Workshop was attended by 50 participants, including representatives from international agencies, government ministries and local stakeholders, namely: Committee for Environmental Protection (CEP), HydroMet, World Bank (WB) and GIZ.

Based on the given missions and validation workshop, the stakeholders have agreed on an extensive list of project activities most suitable for target districts both in the upstream and downstream of Kafernigan river basin. Specifically, under the Component 2 of the Project Proposal – “Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes” (**Outcome 2** – An integrated approach to building climate resilience of agro-ecological landscapes operationalized at a village level, in the **Activity 2.1.2**. Establish EbA demonstration plots in each of the target villages), the project has proposed community demonstration activities in the target communities. These demonstration activities consists of the main EbA interventions to be implemented, and will be the main platform for: i) demonstrating enhanced crop and livestock productivity; ii) training farmers and pastoralists on the technical details of how to implement EbA interventions; and iii) demonstrating how the interventions reduce climate change-induced soil erosion.

Examples of the measures that have been identified as successful and/or potentially successful in the KRB are described in Table 1 below. The listed EbA measures have been identified as priority interventions in the northern and southern sub-basins of the KRB, as indicated. Final selection of activities in each watershed will be through the participatory development of WAPs (Activity 2.2.2). Communities will select the most appropriate interventions for their watersheds through the WAP development process. It is expected that all activities mentioned in Table 1 will be implemented; however, a right combination of measures will be determined and appropriately customized for each local sub-watershed through local engagement and community participation.

Table 1. EbA measures recommended as successful in the KRB.

#	Project Activities	Applicable area***
1	Construction of ‘protection’ gabions along rivers to provide buffers during flash floods.	N, S
2	The introduction of water-saving irrigation techniques such as drip irrigation, dry farming, composting/mulching and making use of cover crops.	N, S
3	Rehabilitation/restoration of degraded forest ecosystems making use of <i>saxaul</i> species, as well as others.	N, S
4	Sustainable harvesting for livelihoods from existing ‘healthy’ forest ecosystems.	N
5	Establishing livestock exclusion zones for the growing of fodder crops such as Lucerne and sainfoin.	N, S
6	Establishing shelterbelts to reduce the deposition of wind-eroded sediment on crops and integrating bio-drainage measures to improve water infiltration.	N, S
7	Introducing indigenous and palatable grass seeds into degraded rangelands.	N, S
8	Introducing rotational grazing of livestock between pastures to assist with increasing field water absorption and decreasing water runoff.	N, S
9	Pasture management such as land-use planning and introducing improved management measures such as exclusion zones and rotational grazing of livestock.	N, S
10	Establishing joint forest management involving communities and local government.	N, S
11	Introducing intercropping and agroforestry, and in specific areas may include apiculture, i.e. beekeeping.	N, S

12	Introducing sustainable long-term community services such as renewable energy and energy-efficient stoves.	N, S
13	Setting up shelterbelts in areas frequently exposed to erosion.	S
14	Establishing commercial plantations making use of an array of indigenous fruit species in degraded lands.	S
15	Introducing organic mulching for farmers to use on croplands which promotes soil fertility as well as water-saving.	S
16	Diversifying crop use, including drought-tolerant and climate-resilient crops.	S
17	Establishing greenhouses for horticulture including local lemon, tomato and cucumber.	S
18	Establishing community woodlots in abandoned areas for fuelwood.	S
19	Providing additional and improving existing extension services provision which will include developing advisories for farmers.	S
20	Establishing on-farm water resource management.	S
21	Rehabilitating existing irrigation, drainage and pumping systems.	S

***Note: In the 'Applicable area' column, 'N' denotes the northern sub-basin while 'S' denotes the southern sub-basin.

Following preliminary submission of the project proposal to the Adaptation Fund, UNDP prepared towards additional stakeholder consultation visits to suggested target districts in order to further prioritize suitable field level community demonstration activities for each district. Stakeholder Consultation Missions were then carried out in six target districts between the period of 19-26 December 2018.

The purpose of this report, therefore, is to provide the results of field (district) level stakeholder consultation missions, which provide further feedbacks from local stakeholders and local district authorities concerning priority demonstration activities and needs from among suggested list of intended interventions indicated within the proposal.

Below (in Table 2) is a summary list of consultation missions, workshops and site visits carried out throughout the project development process, as well as the later Stakeholder Consultation missions conducted in each of the six target districts of the intended project.

Table 2. Scoping/Inception Mission, Validation Mission, Validation Workshop and Stakeholder Consultation Mission

#	Events / Dates	Purpose	Results
1	Scoping mission , 1-7 March 2018, Dushanbe, Tajikistan	(a) identify baseline projects and existing gaps; ii) identify an overarching project objective based on the original concept; iii) gather suitable information to develop a CP. These objectives were addressed through conducting meetings with <i>inter alia</i> priority stakeholders in government, international agencies and academia. A list of the stakeholders consulted during the Mission are detailed in Table 3 of the given Report.	Concept Proposal was developed and submitted for comment to the UNDP Country Office and UNDP Regional Technical Advisor

2	Validation mission , 11-22 June 2018, Dushanbe and six districts of Tajikistan	<p>(a) identify the river basin – and relevant catchment(s) for the project to be focused on; (b) identify districts and sites for activity implementation; (c) confirm baseline projects and co-financing; (d) collect information by visiting demonstration sites of integrated catchment management approaches; (e) update the outcomes, outputs and activities designed from the CP stage; and (f) develop indicative financing/budget for proposed project activities – including AF grant funding, co-financing amounts from baseline projects and any additional local funding that may be available.</p> <p>A list of the stakeholders consulted during the Mission are detailed in Table 4 of the given Report.</p>	<p>Concept Proposal was updated and extended draft Project Proposal was developed.</p> <p>The mission followed feedback received on the CP and information gathered during the Scoping Mission.</p>
3	Site Visits , 17-21 June 2018, five districts of Kafernigan river basin and Muminobod district of Tajikistan	To showcase the results of demonstration plots that have successfully implemented integrated catchment management interventions. The sites visited had evidence of drought, flood and erosion damage as a result of a mixture of climate change-induced events and unsustainable catchment management practices. A list of the site visits conducted during the Validation Mission is included in Table 5 of the given Report.	Consultations were held with district-level authorities both in the north and south of the Kafernigan River Basin to discuss potential sites and adaptation measures that could be implemented through the proposed project.
4	Validation Workshop , 22 June 2018, Dushanbe, Tajikistan	<p>(a) provide information to priority stakeholders on the proposed project, the current proposal development process and the work carried out on mission; (b) obtain stakeholder contributions/inputs; and (c) facilitate integration of stakeholder inputs into the final stage of development process.</p> <p>During the workshop, group work was conducted whereby the participants were asked to identify areas within the Kafernigan River Basin where climate resilience should be improved through the proposed project. Participants were expected to use their local knowledge of the region as well as their on-the-ground experience to list what activities would be beneficial in which regions. More details on list of workshop attendees and minutes of Validation Workshop are available with UNDP and can be provided upon request.</p>	Feedback on the concept and design was constructive with all participants willing to be a part of the process and activities going forward. Stakeholder feedbacks and suggestions were duly integrated into the draft Project Proposal.
5	Stakeholder Consultation Missions , 19-26 December 2018, six target districts of Kafernigan River Basin, Tajikistan	Further prioritization of suitable field level community demonstration activities for each target districts, namely: Qabodiyon, Nosiri Khisrav and Shaartuz districts (downstream); as well as Varzob, Fayzabad and Vahdat districts (upstream).	Feedback on priority demonstration activities and a priority list of interventions from district level stakeholders from each target district;

The list of the stakeholders consulted during the Scoping Mission (1-7 March, 2018) are detailed in Table 3 below:

Table 3. List of Stakeholders consulted during the Scoping Mission to Dushanbe, Tajikistan

Stakeholder	Stakeholder type
Aga Khan Development Foundation (AKDN)	Regional development agency
Agency of Statistics	Government agency
Asian Development Bank (ADB)	International development agency

Stakeholder	Stakeholder type
ClimAdapt	International organisation
Committee of Environmental Protection (CEP)	Government agency
<i>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)</i>	International development agency
European Union (EU)	International organisation
Food and Agriculture Organisation of the United Nations (FAO)	International development agency
Forestry Agency	Government agency
KFW	International development bank
Ministry of Economic Development and Trade (MEDT)	Government agency
Ministry of Energy and Water Resources (MEWR)	Government agency
Ministry of Transport	Government agency
National Agency on Hydrometeorology (Hydromet)	Government agency
Swiss Agency for Development and Cooperation (SDC)	International development agency
UNDP Disaster Risk Management Programme (DRMP)	UNDP programme
United Nations Children's Fund (UNICEF)	International development agency
United States Agency for International Development (USAID)	International development agency
University of Central Asia (UCA)	Regional academic institution
World Bank	International development bank

Following the Scoping Mission, the team developed a Concept of the Project. The mission then followed feedback received on the Concept and information gathered during the Inception Mission. Ms. Ketii Chachibaia, the UNDP Regional Technical Advisor (RTA), joined the first week of the Validation Mission from 11-14 June 2018 to partake in stakeholder engagement meetings. Additional objectives of the Validation Mission (in addition to those indicated in Table 2 above) were to:

- Detail and refine proposed project activities (ensuring that they are not replicating activities implemented by other projects but rather complementing them);
- Meet with a variety of stakeholders in government, civil society organisations (CSOs), academia and other institutions to check relevancy of proposed project activities and ensure that they are beneficial;
- Align proposed activities with the ongoing goals of government as well as other projects and programmes;
- Ensure that regional administration support is – and will be made – available to endorse the proposed activities;
- Identify potential risks and barriers to the proposed project and ways to overcome them;
- Identify stakeholders to partake in project activities;
- Identify areas for project interventions; and
- Collect relevant on-the-ground information for the design of the project.

The list of all stakeholders consulted during the Validation Mission (11-22 June 2018) are included in Table 4 below:

Table 4. List of stakeholders consulted during the Validation Mission to Dushanbe, during site visits to demonstration sites as well as during field trips to potential sites in the Kafernigan River Basin.

Stakeholder	Stakeholder type
Agency for Technical Cooperation & Development (ACTED)	International development agency
AKDN	Regional development agency

Stakeholder	Stakeholder type
Agency of Forestry	Government agency
CARITAS, Muminibad	International development agency
Committee of Emergency Services & Civil Defence (CoES)	Government
CEP	Government agency
Faizabad Region Chairman	Government
Kabodyon Region Chairman	Government
MEWR	Government agency
Nosiri Khisrav Region Chairman	Government
Open Centre, Department of Geology (DoG)	Government
Pasture User Union (PUU) Representative, Faizabad	Community organisation
University of Central Asia (UCA)	Academic institution
Vahdat Region Chairman	Government
World Bank	International development bank

The Validation Mission also included Site Visits (field trips) that were undertaken to showcase the results of demonstration plots that have successfully implemented integrated catchment management interventions. Field visits were conducted to the potential sites within the following areas:

- Faizabad area in the north of the Kafernigan River Basin;
- Vahdat area in the north of the Kafernigan River Basin;
- Kabodyon area in the south of the Kafernigan River Basin;
- Shaartuz area in the south of the Kafernigan River Basin; and
- Nosiri Khisrav area in the south of the Kafernigan River Basin.

The sites visited had evidence of drought, flood and erosion damage as a result of a mixture of climate change-induced events and unsustainable catchment management practices. Consultations were held with district-level authorities both in the north and south of the Kafernigan River Basin to discuss potential sites and adaptation measures that could be implemented through the proposed project. A list of the site visits conducted is included in Table 5 below.

Table 5. List of site visits conducted during the Validation Mission.

Date	District	Details of site(s)
Sunday 17 June 2018	Muminibad	<ul style="list-style-type: none"> • Not located within Kafernigan River Basin. • SDC-implemented project in Muminibad to the east of Dushanbe, with CARITAS. • Project is currently in its third phase, having been implemented for eight years. • Sites included intercropping, establishment of bee hives, exclusion zones, rehabilitation of slopes, constructing gabions along rivers and the diversion of river pathways. • 'Espacett' ('<i>alpha alpha</i>') grown extremely well as fodder crops and is attractive to bees for apiary.
Monday 18 June 2018	Faizabad	<ul style="list-style-type: none"> • North (upstream) within Kafernigan River Basin. • To the north-east of Dushanbe to visit a WB, SDC and AKDN-implemented project. • Met with chairman who took us to sites along the river that require dams

Date	District	Details of site(s)
		because of flood damage.
Tuesday 19 June 2018	Kabodyon	<ul style="list-style-type: none"> • South (downstream) within Kafernigan River Basin. • South of Dushanbe, between ~10–25 km north of the Afghanistan border, within the Kafernigan River Basin. • Potential sites along the Kafernigan River that were highlighted all require river bank reinforcement. • Demonstration site of the concrete tetrahedrons used to reinforce the river bank to enable trees be planted for stabilisation. • Met with chairman of the district, as well as representatives from Water Department – Representative from the water department took us to sites.
Tuesday 19 June 2018	Shaartuz	<ul style="list-style-type: none"> • South (downstream) within Kafernigan River Basin. • <i>Saxaul</i> trees/shrubs have been grown there for 11 years for dust capture. • Located close to the borders of Afghanistan and Uzbekistan – mountain ranges in both countries are visible from this plateau. Wind travels from across the borders across this plateau. • Considered the hottest area in Tajikistan.
Wednesday 20 June 2018	Nosiri Khisrav	<ul style="list-style-type: none"> • South (downstream) within Kafernigan River Basin. • ~1,000 cultivated land that cannot be used because of saline groundwater. • Pumps constructed in 1972 (Soviet era) to pump groundwater into the river. Five pumps constructed, only one is operational. If that one stops working, the entire pumphouse floods. • Tried planting rice in the region but there is not enough water for it, but there is too much water for other crops
Thursday 21 June 2018	Vahdat	<ul style="list-style-type: none"> • North (upstream) within Kafernigan River Basin. • Met with chairman and four other department representatives. • Visited a site where the bank is eroding into the river from a distance up the mountain and silting up the canal to the communities.

The Validation Mission was concluded with a Validation Workshop on Friday, 22 June 2018, held in the Lotus Conference Hall, UNDP DRMP Project Office in Dushanbe. The workshop was attended by 50 people – representatives from government ministries and agencies, and local stakeholders.

During the workshop, group work was conducted whereby the participants were asked to identify areas within the Kafernigan River Basin where climate resilience should be improved through the proposed project. Participants were expected to use their local knowledge of the region as well as their on-the-ground experience to list what activities would be beneficial in which regions. Full minutes of the workshop, group work and Q&A have been documented and is available with UNDP Country Office upon request (due to volume of the given Report).

The Validation Workshop was a successful event with positive feedback from all participants. Feedback on the concept and design was constructive with all participants willing to be a part of the process and activities going forward.

Due to the volume of the given reports, the following appendices are not included, but are available with UNDP Country Office Team, to be provided immediately upon request. The following appendices are available as separate documents:

- Appendix 1: Original conceptual brief for the Project;
- Appendix 2: List of Validation Workshop Attendees;
- Appendix 3: Minutes of the Validation Workshop (11-22 June 2018).
- Full Version of Consolidated Stakeholder Consultations and Missions Report with relevant Appendice (Agenda of Stakeholder Consultation Meetings, List of Questions for Focused Group Discussions, Evaluation Matrix Table, List of Participants (all districts)).

Annex 2. ENDORSEMENT LETTER

КУМИТАН
ҲИФЗИ МУҲИТИ ЗИСТИ НАЗДИ
ҲУКУМАТИ ҶУМҲУРИИ
ТОҶИКИСТОН

734003, шаҳри Душанбе, кӯчи Шамси, 5/1
Тел./факс: (992 37) 236-40-59, 236-13-53
Веб-сайт: www.hifzatabiat.tj
Почтаи электронӣ: muhit@hifzatabiat.tj



КОМИТЕТ
ОХРАНЫ ОКРУЖАЮЩЕЙ СРЕДЫ
ПРИ ПРАВИТЕЛЬСТВЕ
РЕСПУБЛИКИ ТАДЖИКИСТАН

734003, город Душанбе, улица Шамси, 5/1
Тел./факс: (992 37) 236-40-59, 236-13-53
Веб-сайт: www.hifzatabiat.tj
Электронная почта: muhit@hifzatabiat.tj

COMMITTEE OF ENVIRONMENTAL PROTECTION
UNDER THE GOVERNMENT OF THE REPUBLIC OF TAJIKISTAN

5/1 Shamsi str., 734003, Dushanbe city, tel./fax: (992 37)236-40-59, 236-13-53 web-site: www.hifzatabiat.tj, e-mail: muhit@hifzatabiat.tj

№ 1/26-03-92 19 Jan. соли 2017.

Ба № _____ аз « _____ » соли 2017

19 January 2018

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the project "Increasing Climate Resilience of Rural Communities in Tajikistan"

In my capacity as designated authority for the Adaptation Fund in Tajikistan, I confirm that the project proposal "Increasing Climate Resilience of Rural Communities in Tajikistan" is in accordance with national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Tajikistan.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNDP in Tajikistan.

Sincerely,

Khayrullo Ibodzoda
Chairman of the Committee
for Environmental Protection
under the Government of the Republic of Tajikistan

Annex 3. JUSTIFICATION FOR SELECTION OF THE KOFIRNIGHAN RIVER BASIN

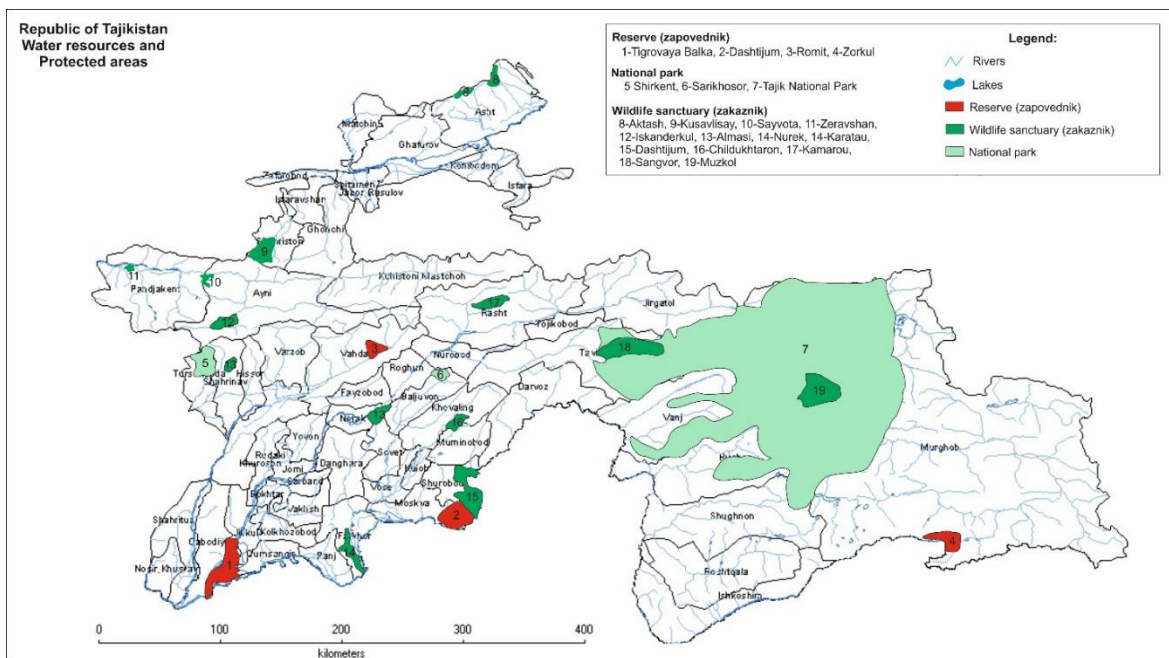


ADAPTATION FUND

SUPPLEMENTARY INFORMATION TO PROJECT PROPOSAL:

JUSTIFICATION FOR PROJECT TARGET AREA SELECTION

“An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan”



I. RIVER BASINS IN TAJIKISTAN

i. Overview

The terrain of Tajikistan has been eroded to form a diverse range of mountains and steep valleys. Tajikistan's mountain ranges create several hydrographic areas, which in turn form numerous river basins. The country's Water Sector Reform Programme for 2016–2025³¹⁰ delineates four river basins according to hydrological boundaries as follows:

- A section of the **Syr Darya River** that is located in Tajikistan. The Tajik part of Syr-Darya River Basin consists of the Syr-Darya River and its tributaries within Tajik borders. As a management unit, Syr-Darya includes the Zarafshan sub-river basin. Both are of inter-state importance, and the management of their water resources is part of the Interstate Commission for Water Coordination in Central Asia (ICWC).
- A section of the **Pyanj River** that is located in Tajikistan. The Tajik part of the Panj River Basin includes the area of the Panj River and its tributaries within Tajik borders. The boundaries of the basin to the North and West are the boundaries of the Vakhsh River basin, while the boundary to the South is the channel of the Panj River, which also forms the border with Afghanistan.
- **Vakhsh River Basin.** The Vakhsh River Basin includes the whole basin of the Vakhsh River and its tributaries, except for the extreme upstream part, which is located in Kyrgyzstan.
- **Kofirnighan River Basin.** The Kofirnighan River Basin (KRB) consists of the Kofirnighan River and its tributaries, namely Elok, Sarvo, Varzob. Further details on the KRB are provided below.

ii. Kofirnighan River Basin

Situated in the south-western and western parts of the country, the KRB occupies a total area of ~11,600 km², with the mountain catchment making up 8,070 km² of this – equating to ~70% of the total basin area³¹¹. The basin is divided into two regions, namely the north and the central/south regions³¹². The Gissar Valley encompasses the north region, which includes the city of Dushanbe, while the Kofirnighan and Beshkent valley depressions make up the south region. The Gissar Ridge forms the highland areas, extending for 250 km to elevations of ~4,500 masl and is home to 343 glaciers, covering a total area of 115 km².³¹³ The river of Kofirnighan, at ~387 km long, is one of the major contributing inflows of Tajikistan's largest river, the Amu Darya River³¹⁴. It flows through different mountain ranges and zones within the basin including high mountains, intermediate foothills and low and flat zones. The basin's groundwater reserves are economically important and are used to irrigate crops (~98,000 ha) and pastures (~56,000 ha). Most of the irrigated land is in the arid southern sub-basin, while cultivated land in the northern sub-basin is largely rain-fed.

iii. Surface water and groundwater in the Kofirnighan River Basin

The average annual flow of surface water in Kofirnighan is approximately 5.2 km³. Given that more than 90% of the river runoff floods each year, the prevalence of mudflows in the KRB is high. The greatest mudflow activity occurs at the headwaters of Kofirnighan, where destructive mudstone and water-stone flows are formed. Such activity is

³¹⁰ Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme). 2015. Resolution of the Government of the Republic of Tajikistan. Unofficial translation.

³¹¹ Tahirov IG & Kupayi GD. 1994. Water resources of Tajikistan of the Republic of Tajikistan. Dushanbe 1:181.

³¹² Fergana Valley WRM 2018 KRBMP Unpublished.

³¹³ Ibid.

³¹⁴ Tahirov & Kupayi 1994 Water resources of Tajikistan.

particularly problematic because the population living in this basin has already been facing extreme events associated with natural and anthropogenic climate change.

Operational reserves of groundwater in the KRB constitute 0.53 km³/year and are also subject to negative anthropogenic influences. Potential reserves of hydropower resources of the KRB are estimated to make 2.883 million kW, only 1.07% of which is currently being realised. In addition to energy generation, groundwater reserves are also being used for irrigation, whereby there are also approximately 56,000 ha of watered pastures³¹⁵. For example, the large Hissar channel irrigates approximately 38 thousand hectares of land. Further development of irrigation in the downstream of the basin will depend on the construction of the Lower (Nijny) Kofirnighan water reservoir.

iv. Population and its effects on water resources

In terms of political divisions, the KRB is made up of 10 administrative districts, 4 cities including Dushanbe, 10 villages and 77 *jamoats* (rural self-governance bodies) (Table 1). As of January 2017, the total KRB population was 2.8 million people, with ~62% living in rural areas and ~38% in towns. Over the past 13 years, the KRB population has increased by 712,000 people (representing a ~34% total increase and an annual growth rate of 2.5%). The KRB, unlike other basins in the country, is characterized by high population density (205 people per km²)³¹⁶ and developed economic activities. Indeed, 32% of the Tajikistan's total population resides in the KRB, which makes up only 11% of the country's territory. Both this high population density and degree of economic activity has affected water resources in the basin. Due to rapid population growth and economic development, the volume of water withdrawal in the KRB is high, constituting 3.6 km³/year, 410 million m³ of which comes from groundwater. Water supply is also seasonal, whereby the inflows to Kofirnighan – from Varzob, Khanaka, and Ilyak – only run during flood seasons, resulting in downstream areas suffering from seasonal water shortages.

Table 1. Population data for cities and districts of Kofirnighan River Basin³¹⁷.

#	Cities and districts	Population data as of 1.01.2017 in thousands			Population density for 1 km ²	Number of cities	Number of urban-type villages	Number of <i>jamoats</i>
		Total	%					
			Urban	Rural				
1	Dushanbe city	816,2	100	0	8162	1	-	-
2	Varzob	76,9	3,3	96,7	45,2	-	1	6
3	Vahdat	324	16,8	83,2	87,6	1	1	10
4	Hissar	287,4	14,4	85,6	287,4	1	1	11
5	Fayzabad	96,9	10,0	90,0	107,7	-	1	7
6	Tursunzade	280	18,9	81,1	233,3	1	-	9
7	Shahrinav	114,4	6,4	93,6	114,4	-	1	6
8	Rudaki	476,5	10,9	89,1	264,7	-	3	13
9	Nosiri Khisrav	35,9	0	35,9	44,9	-	-	3
10	Qabodiyon	173,8	6,6	93,4	96,6	-	1	7
11	Shahrituz	120,5	13,5	86,5	80,3	-	1	5
Total		2802,5	37,9	62,1	180,8	4	10	77

To improve water supply to areas in the basin, it is necessary to reconstruct several reservoirs in the KRB, particularly the Zidin, Lower (Nijny) Kofirnighan and Shirkent reservoirs. It will also be necessary to work on marking the boundaries of the KRB as a management unit.

II. SELECTION CRITERIA FOR PROJECT TARGET AREAS

³¹⁵ Tahirov I & Kupai G. 1998. Water resources of Tajikistan. Dushanbe.

³¹⁶ Agency for Statistics under the President of the Republic of Tajikistan. 2017. Districts of the Republic of Tajikistan.

³¹⁷ Agency for Statistics under the President of the Republic of Tajikistan. 2017. Regions of the Republic of Tajikistan.

The selection of target areas is based on three main criteria:

- relevance of a chosen site to Integrated Water Resources Management (IWRM), River Basin Management (RBM) and the Water Sector Reform Programme under implementation by the Government of the Republic of Tajikistan;
- degree of climate-related vulnerabilities, including a population's climate resilience and adaptive capacity at a chosen site; and
- distribution of donor development support at a chosen site.

Based on the criteria above, as well as discussions with national authorities and donor development partners, it is suggested that the target area for project interventions is the KRB. Indeed, preliminary analyses of relevant interventions in various regions of Tajikistan indicate that project objectives will be most effective in the KRB. A detailed justification for the site selection is provided in the sections that follow.

While vulnerabilities are significant in each river basin of Tajikistan, the KRB is particularly vulnerable, based primarily on the area's: i) population number and density; ii) having received limited support for the implementation of IWRM; iii) markedly high exposure to mudflows. In addition, the KRB fulfils all the selection criteria for project target areas, as described below.

III. CRITERION 1: INTEGRATED WATER RESOURCES MANAGEMENT (IWRM)

i. Water Reform Programme and the river basin management approach

In 2016, the Government of Tajikistan endorsed the Water Sector Reform Programme, focussing primarily on transitioning to **Integrated Water Resources Management (IWRM)** and **River Basin Management (RBM)**. The proposed water reforms are based on common regulatory principles of IWRM and focus on considering social, economic and environmental interests through the sustainable and balanced management water resources. Given the importance of water to the agriculture sector – that employs approximately two thirds of Tajikistan's population – the water reform is inextricably linked to the agricultural reform that was approved in 2012.

Despite the many different definitions for IWRM, almost all of them employ the same principles. In the context of Tajikistan, the definition of IWRM is proposed as:

“Integrated Water Resources Management is based on the interaction of various sub-sectors with the objective of good accessibility to high quality water and sanitation services for the population, ensuring water availability for Irrigation, hydropower, environment and other users within river basins defined by hydrographic boundaries. IWRM promotes protection of water resources from over-exploitation and pollution, provides protection of vulnerable mountain environments and of river banks and floodplains from flooding and erosion, and facilitates public participation in decision-making, planning, financing and development of water resources in the interests of economic growth, sustainable development of the society and preservation of the environment.”

Proper water resource planning is only possible within the natural flow area of the water resources, because all actions upstream have an immediate effect on the downstream water availability and quality. Therefore, the river basin is the best management area for water resource management. A basin can be defined as an area that is drained by one river outlet and bordered by the water source upstream and the outflow body (sea or lake) downstream. In this regard, the introduction of the basin management approach to water resources management, which is an integral part of IWRM, is considered an important principle of the water sector reform.

In addition to promoting IWRM and river basin management, the water sector reform foresees the establishment of National Water Council (NWC), which will be the highest authority in the development of policy in the water sector. In line with the principles and objectives of the reform, the NWC will have the following tasks and objectives:

- adoption and development of public policy and legislation in the field of **IWRM** and effective use and protection of water resources;
- request to develop policy on management of water resources and **protection of the environment**;
- development of policy for control of the **rational use** of water resources;
- recommendation of limitation of water use;
- elaboration of an **investment policy** for the development, use and protection of water resources;
- drafting and management of international agreements in the use and **protection of water resources**; and
- development of policies to cope with the **impacts from climate change** in the use and protection of water resources.

ii. IWRM and climate change

Climate variability and change have significant impacts on the water resources of Tajikistan. According to the available data, during the last decades average temperature in Tajikistan increased by 0.7–1.9°C and ~1,000 small glaciers have melted. Over the short term, glacial melt has resulted in hydroclimatic disasters such as floods, droughts, landslides and mudslides (Figure 1). Considering that the main source of water of the Tajikistan’s rivers are glaciers, glacial melt over the medium and long terms reduce water flow in the country’s rivers.

To address the above climate change threats, the IWRM has made provisions for assisting communities to cope with climate variability. This role is characterised by three focal points, namely: i) water resources management at adequate level; ii) the organization of participatory management practices; and iii) policy development. Each of the above-described focal points carefully considers the country’s various vulnerable groups. Hence, IWRM aims to address climate change within Tajikistan’s water governance in the context of reducing vulnerability of poor people, specifically by maintaining livelihoods and supporting sustainable development.

Critical management functions of IWRM that may assist communities adapt to changing climate in the context of Tajikistan consider the following water allocation, pollution control, monitoring, financial management, flood and drought management, information management, river basin planning and stakeholder participation. Such functions of IWRM are instrumental in coping with climate variability in the following ways³¹⁸:

- monitoring water quantity and quality allows management to proactively take action towards adaptation;
- management of floods and droughts allows for direct intervention in cases of extreme events; and
- river basin planning, risk assessment and adaptation measures can ensure rapid response and build climate resilience.

Of the four river basins identified by Tajikistan’s Water Reform Programme, the Kofirnighan River Basin (KRB) is one that currently does not have focused efforts being made towards IWRM³¹⁹. Compared to the other three basins, KRB has received the fewest interventions from government and donors to date. The KRB is topographically and climatically very variable and is highly vulnerable to extreme climate events such as GLOFs, floods, mudflows and landslides^{320,321}. It is also the smallest of the country’s four basins and is fully encompassed within Tajikistan – i.e. is not transboundary. A Kofirnighan River Basin Management Plan (KRBMP) has been developed for the basin. Although this plan includes water management, it does not integrate land and natural resources into that management.

It is the view of all national ministries and agencies (MoEWR, CEP, ALRI) involved in water resources management that the KRB is the most suitable basin for the project. The MoEWR, CEP and ALDI have also agreed that the

³¹⁸ International Network for Capacity Building on IWRM (CAPNET). 2009. IWRM as a Tool for Adaptation to Climate Change. UNDP.

³¹⁹ Fergana Valley WRM 2018 KRBMP Unpublished.

³²⁰ State Agency for Hydrometeorology (Hydromet). 2018. Assessment of Kofirnighan River Basin (KRB), natural disasters and needs. Unofficial document.

³²¹ see sub-section on KRB below

project is relevant to Tajikistan's water sector reform and would contribute to implementing of IWRM in the country, as well as linking it to building climate resilience.

IV. CRITERION 2: CLIMATE VULNERABILITY

The KRB has been identified as a region within Tajikistan that is particularly vulnerable to the impacts of extreme climate events, with almost 200 communities living in the basin experiencing severe negative impacts^{322,323}. All four of Tajikistan's agro-ecological zones are represented within the KRB as a result of the considerable altitudinal variation from south to north³²⁴. This altitudinal variation also results in the KRB being vulnerable to a wide range of climatic hazards, including both sudden-onset and slow-onset climate events, such as GLOFs and droughts, respectively (Table 2). Communities in the KRB are frequently exposed to such extreme climate events. Flooding and landslides pose the greatest threats to these communities, with flooding seasons differing between upper, middle and lower reaches of the KRB. Upstream reaches experience floods from April to June, the middle reaches from March to May, and the downstream reaches from February to May. Because of the longer season in the downstream areas, the risk of flooding and landslides is much greater for these communities³²⁵.

Six districts within the KRB have been identified as the most vulnerable to the impacts of climate change. These are the: i) Vakhdat, Faizobod and Varzob districts in the north; and ii) Nosiri Khusrav, Kabodiyon and Shaartuz districts in the south.³²⁶ Many of the households in these districts are located in hazardous areas and experience a number of climate-related threats and disaster events including: i) floods; ii) mudflows; iii) landslides; iv) rockfalls; and v) avalanches³²⁷.

In addition to increased exposure to climate-related threats, these are all rural communities with limited adaptive capacity because of their dependence on agriculture for livelihoods, and limited opportunities for alternative income. About one-third of the agricultural losses in Tajikistan are currently attributable to climate change and variability³²⁸, meaning that communities in the KRB who rely on agriculture for income are extremely vulnerable to the current and future impacts of climate change.

The impacts of climate change are likely to be different in the northern sub-basin of the KRB to those in the southern sub-basin. Rural communities in the Vakhdat, Faizobod and Varzob districts are expected to become increasingly exposed to hydrometeorological hazards such as increased flooding, mudflows, landslides and GLOFs. In particular, the steep terrain in these areas increase the likelihood of sudden onset multi-hazard risks, such as landslides occurring directly after a GLOF or similar flooding event. Concomitantly, watersheds in the northern sub-basin are frequently degraded as a result of unsustainable land-use practices that increase the likelihood and impact of the above-mentioned risks. Such unsustainable practices also increase the rate of erosion and soil loss, which compromises agricultural productivity in these regions and increases flood risk in downstream areas.

Communities in the Nosiri Khusrav, Kabodiyon and Shaartuz districts, conversely, are increasingly exposed to slow onset hazards such as drought and river bank erosion. In these areas, water availability is the greatest threat to livelihoods. Water availability is limited by poorly functioning irrigation supply infrastructure. This infrastructure is being damaged by: i) high levels of sedimentation from water-borne and wind-borne sediment; and ii) floods in the Kofirnighan River that damage irrigation dams and canals. Floods in the Kofirnighan River also cause riverbank erosion that results in the loss of arable land.

³²² Hydromet 2018 Assessment of KRB, Unofficial document.

³²³ Further information concerning the KRB's vulnerability to extreme climate events is presented under 'Climate change context'.

³²⁴ Tajikistan's agro-ecological zone are classified according to elevation, with the lower zones (1 and 2) primarily being used to grow irrigated crops such as cotton and sub-tropical fruit. Zones of higher elevation (3 and 4) are primarily rain-fed agriculture and used primarily for pasture land and for growing wheat, barley and lucerne.

³²⁵ Hydromet 2018 Assessment of Kofirnighan River Basin.

³²⁶ Fergana Valley WRM 2018 KRBMP Unpublished.

³²⁷ Further information concerning district-specific vulnerability to extreme climate events is presented under district descriptions.

³²⁸ NHDR 2012 Tajikistan: Poverty in the Context of Climate Change.

Table 2. Environmental disaster events for the period 1997–2010³²⁹.

#	Districts of KRB	Frosts and cold spells	Wind storms	Hails	Thunderstorms	Rains	Rainfall	Drought	Land-slides	Crumbing	Rock-falls	Soil sedimentation	Avalanches	Mudflows	Floods	Waterlogging	Water run-off	Total
1	Varzob	0	1	4	0	17	1	1	8	0	0	0	3	8	4	0	0	47
2	Vahdat	0	7	9	0	19	2	0	1	1	0	0	0	11	15	0	0	65
3	Hissar	0	2	6	1	13	3	2	3	2	1	0	0	10	7	0	0	50
4	Qabodiyon	0	4	3	0	13	1	1	0	0	0	0	0	8	12	0	0	42
5	N. Khisrav	1	19	0	0	6	1	1	0	0	0	0	0	2	1	0	0	31
6	Rudaki	0	8	6	0	34	6	0	5	0	0	1	0	36	8	0	0	104
7	Tursunzade	0	0	2	0	7	0	0	2	0	0	0	0	7	3	0	1	22
8	Fayzabad	0	9	8	0	11	3	0	2	0	0	0	0	7	8	0	0	48
9	Shahrinav	0	1	4	0	14	2	0	1	0	0	0	1	10	3	0	0	36
10	Shahrituz	0	3	1	0	13	0	1	0	0	0	0	0	7	7	1	0	33
11	Total	1	54	43	1	147	19	6	22	3	1	1	4	106	68	1	1	478

³²⁹ Source: Committee for Emergency Situations and Civil Defence.

A population's ability to conduct meteorological and hydrological monitoring plays an important role in the early detection of flooding and mudflow events. The most optimal average number of stations for monitoring must comprise 1 station per 1000km/sq (Table 3). In the KRB, there is an average of 11 meteorological stations and 13 hydrological stations (equating to 1.55 units per 1000km²). This indicates that there is sufficient means for monitoring in the basin. Nevertheless, specialized agencies and units require significant improvements in functional reliability with regards to analysis, prognosis, zoning and monitoring of water related hazards.

Table 3. List of meteorological stations (hydroposts) in the Kofirnighan River Basin³³⁰.

#	Stations	Index	Latitude		Longitude		Height, meters above sea level	Work period
			Degrees	Minutes	Degrees	Minutes		
1	Ayvadj	38930	36	58	68	2	318	2014-2018
2	Anzob	38719	39	5	68	52	3373	1939-2018
3	Bustonobod	38842	38	40	69	38	1964	1948-2018
4	Hissar	38837	38	30	68	39	768	1968-2018
5	Dushanbe	38836	38	35	68	44	800	1946-2018
6	Isambay	38838	38	3	68	21	563	1949-2018
7	Fayzabad	38845	38	32	69	19	1215	1943-2018
8	Hushyori	38833	38	53	68	50	1361	1945-2018
9	Chormagzak	38841	38	28	69	12	1730	1963-2018
10	Shahrituz	38937	37	19	68	9	378	1929-2014
11	Maykhura	38717	39	1	68	47	1922	1963-2018

V. CRITERION 3: DISTRIBUTION OF DEVELOPMENT SUPPORT

Following the endorsement of the Water Sector Reform Programme by the Government of Tajikistan, the lead agency (MoEWR) has agreed with key donor development partners on a plan to equitably distribute technical assistance and development projects in each river basin. This equitable distribution was decided in the context of upcoming multi-million projects being channelled in support of water sector reforms by the World Bank, Asian Development Bank, Swiss Development Agency and Cooperation, Japan International Cooperation Agency, and the European Union (Table 4). In more recent months, other organizations and international NGOs have joined existing projects through consultations with the MoEWR and the Donor Development Council (DDC).

In each river basin that has secured support, donor organisations are required to provide technical assistance to the MoEWR with regards to the following activities:

- establishment of the River Basin Organisations and Sub-river Basin Organisations;
- establishment of River Basin Councils;
- development of long-term basin plans for the use, protection and development of water resources, as well as annual and seasonal plans for the distribution and management of water resources; and
- development of capacity-building workshops for River Basin Organisations and Sub-river Basin Organisations.

Table 4. River basins, key donor agencies and the status of interventions per river basin in Tajikistan.

#	River basins	Key donor agencies	Status
1	Syr-Darya river basin	World Bank, Swiss Agency for Development and Cooperation, HELVETAS Swiss Inter-cooperation	Ongoing since 2016
2	Zeravshan sub-river basin	World Bank, European Union, German Cooperation Agency	Ongoing since 2016
3	Vakhs River Basin	World Bank	Ongoing since 2016
4	Pyanj River basin	World Bank, Asian Development Bank, Japan International Cooperation Agency	Ongoing since 2016

³³⁰ National Agency for Hydrometeorology.

5	Kofirnighan River Basin	World Bank	Preparation since 2018
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The KRB was the last of Tajikistan’s river basins to receive donor support – i.e. from the World Bank in 2018. Yet, having secured this support, the KRB fulfils the third criteria of site selection, which makes it eligible as a target site in the proposed project.

VI. PRELIMINARY TARGET DISTRICTS IN THE KOFIRNIGHAN RIVER BASIN

Based on the preliminary analysis above, as well as an analysis of climate-related vulnerability information from District Development Plans of the KRB, it is suggested that the following six districts within the KRB are target sites for the project (Table 5). The target districts Vahdat, Fayzabad and Varzob are located upstream of the KRB, while Nosiri Khistrav, Kabodiyon and Shaartuz are located downstream of the KRB. The specific number of *jamoats*, *raions* and villages are also selected based on a preliminary assessment of vulnerability data (including *inter alia* climate change observations and projections, climate related disaster events, upstream-downstream linkages) as well as the adaptive capacities of local authorities and target populations.

Table 5. Target districts, total number of *jamoats* and villages and the target number of *jamoats* and villages for respective funding options in the KRB.

#	Target Districts	Total number of units		Target number of <i>jamoats</i> and villages for respective funding option					
				US\$6 million		US\$8 million		US\$10 million	
		<i>Jamoats</i>	<i>Villages</i>	<i>Jamoats</i>	<i>Villages</i>	<i>Jamoats</i>	<i>Villages</i>	<i>Jamoats</i>	<i>Villages</i>
1	Fayzabad	8	71	2	16	3	22	4	30
2	Varzob	6	70	2	24	3	30	4	35
3	Vahdat	10	178	4	45	5	55	6	65
4	N. Khistrav	2	15	1	2	1	4	2	6
5	Shaartuz	5	35	2	7	3	9	4	12
6	Kabodiyon	7	43	3	7	4	11	5	15
Total		38	412	14	101	19	131	25	163

A more specific breakdown of selection indicators for each district is outlined in Table 6 below.

Table 6. District, indicators and sources regarding selection indicators for each district in the KRB.

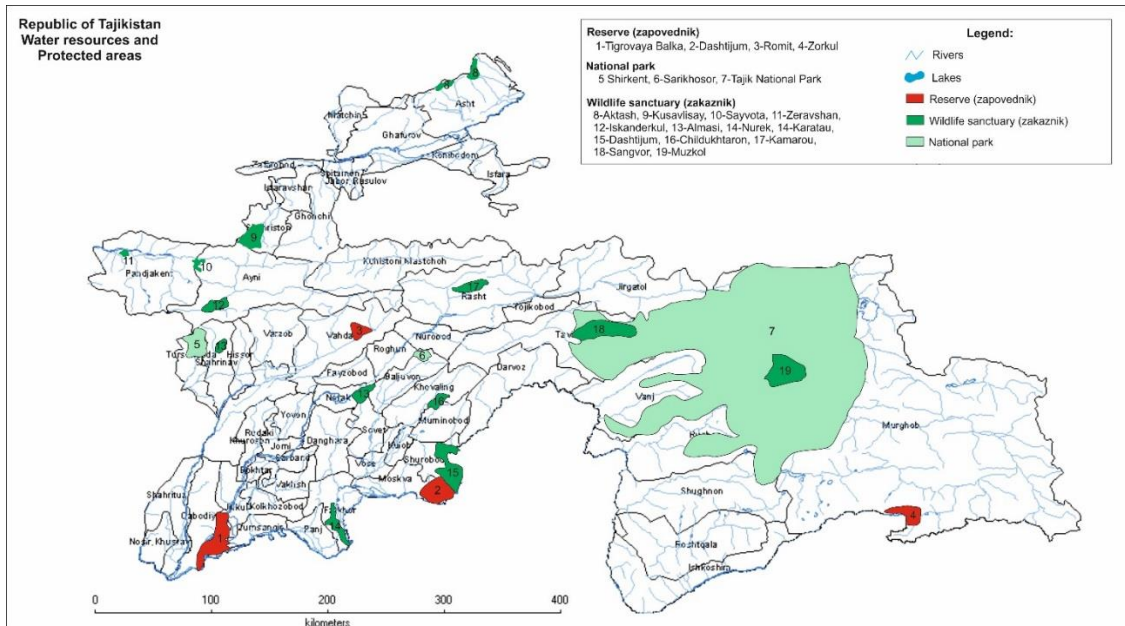
#	District	Indicators	Sources
1	Fayzabad	(a) number of population and households living in hazardous zones; (b) types of disaster events typical in target <i>Jamoats</i> and villages: <i>mud-flows, floods, landslides</i> .	Programme for socio-economic development of Fayzabad district for the period 2016-2020, p.60 (Also referred to as DDP)
2	Varzob	(a) number of villages located in hazardous zones; (b) types of disaster events: <i>landslides, mudflows, rockfalls</i> .	Programme for socio-economic development of Varzob district for the period 2016-2020, p.80
3	Vahdat	(a) number of villages located in hazardous zones; (b) types of disaster events: <i>landslides, mudflows, rockfalls</i> .	Programme for socio-economic development of Vahdat district for the period 2016-2020, p.53
4	Nosiri Khistrav	(a) number of population and households living in hazardous zones; (b) types of disaster events: <i>strong winds, droughts, mudflows</i> .	Programme for socio-economic development of Nosiri Khistrav district for the period 2016-2020, p.60
5	Shaartuz	(a) number of villages located in hazardous zones; (b) types of disaster events: <i>flooding, mudflows, sand storms</i> .	Programme for socio-economic development of Shaartuz district for the period 2016-2020, p.66
6	Kabodiyon	(a) number of villages, households and population in hazardous climatic zones; (b) types of disaster events: <i>flooding, mudflows</i> .	Programme for socio-economic development of Kabodiyon district for the period 2016-2020, p.67

Annex 4. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

**ENVIRONMENTAL AND SOCIAL
MANAGEMENT FRAMEWORK (ESMF)**

for the project titled:

**“An integrated landscape approach
to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan”**



21 September 2018

I. INTRODUCTION

The present Environmental and Social Management Framework (ESMF) has been developed in support of the AF-funded project “*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*” prepared by UNDP together with the Government of Tajikistan. As this project is supported by UNDP, the project has been screened against UNDP’s Social and Environmental Standards (SES) utilizing the UNDP Social and Environmental Screening Procedure (SESP) and deemed a Moderate Risk project.

The project includes a range of activities that have not been fully specified in terms of specific locations/components and cannot be fully assessed at this stage for all potential social and environmental risks and impacts. As such, this ESMF has been prepared that sets out the principles, rules, roles, guidelines and procedures for screening, assessing, and managing the potential social and environmental impacts of the forthcoming interventions. It contains measures and plans to avoid, and where avoidance is not possible, to reduce, mitigate and/or offset adverse risks and impacts. The ESMF specifies the most likely applicable social and environmental policies and requirements and how those requirements will be met through procedures for the screening, assessment, approval, mitigation, monitoring and reporting of social and environmental risks and impacts associated with the activities to be supported.

For the project components that have been defined with a reasonable degree of certainty, this ESMF includes as annexes initial management plans (or outlines thereof) for addressing likely social and environmental impacts and to address the requirements of applicable policies and standards, including the UNDP SES.

i. Overview of the Project

The overall objective of the proposed project is to enhance the climate resilience of small-scale farmers and pastoralists in Tajikistan. Climate-resilient catchment management strategies will inform the planning and development of rural areas on adapting to the increasing impacts of climate change. The strategies will inform the use of Ecosystem-based Adaptation (EbA) interventions that will build the resilience of rural communities while promoting the sustainable management of natural resources through an integrated landscape approach.

Capacity building for EbA, SLM and CSA at the *Raion* (district) and *Jamoat* (sub-district) levels will improve planning and coordination by government decision-makers and local communities for managing the country’s ecosystems. Improved ecosystem management will reduce the risks posed by land degradation. Furthermore, such activities will also increase resilience to climate change. The strengthened enabling environment brought about by the project outputs will: i) improve the governance of natural resources at the *Raion* and *Jamoat* levels; ii) enhance support services and enable participatory, local-level planning; and iii) improve decision-making for implementing EbA interventions across the country.

To achieve this objective, there are three proposed project outcomes listed below:

1. Catchment management strategy to manage climate risks operationalised at raion (district) and jamoat (sub-district) levels in the Kofirnighan River Basin
2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level
3. Existing knowledge management platforms supported for integrated catchment management and EbA

ii. Project components, outcomes and outputs

Table below indicates the proposed component, expected outcomes, concrete outputs and indicative activities of the project, which are further detailed in the project proposal.

Table 1. Project components, expected outcomes, concrete outputs and indicative activities.

Expected Outcomes	Expected concrete Outputs	Indicative activities
Component 1. Integrated catchment management to build climate resilience.		
1. Catchment management strategy	1.1. Multi-hazard climate risk models developed for	1.1.1. Conduct a gap analysis on existing risk information in the Kofirnighan River Basin

to manage climate risks operationalised at <i>Raion</i> (district) and <i>Jamoat</i> (sub-district) levels in Kofirnighan River Basin (KRB).	vulnerable watersheds in the KRB.	1.1.2. Develop Multi-Hazard Climate Risk Models for the Kofirnighan River Basin.
	1.2. Providing support for upgrading automated weather stations in KRB watersheds	1.2.1. Provide technical support for the modernisation of automated weather stations in the most vulnerable districts of the KRB. 1.2.2. Collect and collate data from improved automated weather stations. 1.2.3. Use collected data to inform climate risk information and adaptation advisories for agro-ecological extension service providers.
	1.3. Integrated catchment management strategy developed for the KRB.	1.3.1. Develop an integrated catchment management strategy for the KRB to inform and facilitate cross-sectoral landscape planning. 1.3.2. Deliver a training programme on mainstreaming climate risks for integrated catchment management planning. Sub-activities are detailed below. 1.3.2.1. Training conducted to relevant Committee for Environmental Protection (CEP) representatives to integrate catchment management into implementation and monitoring activities for all projects going forward, both those with a focus on climate change and without. 1.3.2.2. Training provided to the personnel of the supported knowledge management centres – including the DoG Open Centre and to UCA – on assessing available climate risk information and ensuring it is all made available through the relevant portals/hubs. 1.3.2.3. Training provided to <i>Raion</i> -and <i>Jamoat</i> -level government departments on integrated catchment management and identifying climate risks that require such a management approach. 1.3.3. Provide training for selected communities on identification of EbA activities and implementation.
	1.4. Strengthened coordination and training mechanisms integrated climate-resilient catchment management.	1.4.1. Strengthen existing training mechanisms at the <i>Raion</i> and <i>Jamoat</i> levels. 1.4.2. Provide training on integrating EbA into catchment management [link with Activity 2.1.2].
	1.5. Payment for Ecosystem Services (PES) models to support the long-term financing of integrated catchment management strategy implementation.	1.5.1. Develop suitable PES models for the KRB.
	Component 2. Ecosystem-based Adaptation (EbA), including Climate-smart Agriculture (CSA) and Sustainable Land Management (SLM), in agro-ecological landscapes.	
2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	2.1. Agro-ecological extension services supported at the <i>Jamoat</i> level to provide technical support for EbA implementation.	2.1.1. Support agro-ecological extension services by training existing service providers on EbA, climate-resilient agriculture and multi-hazard climate risk management.
		2.1.2. Establish EbA demonstration plots in each of the target villages. 2.1.3. Conduct farmer field schools (FFs) in target villages making use of demonstration plots [Activity 2.1.2].
	2.2. Watershed Action Plans (WAPs) developed that promote climate resilience and enhance economic productivity for target communities.	2.2.1. Conduct participatory mapping at the watershed level.
		2.2.2. Develop Watershed Action Plans (WAPs) for vulnerable watersheds in the KRB.
	2.3. EbA interventions implemented in target watersheds by local communities.	2.3.1. Support local communities to implement priority EbA interventions.
		2.3.2. Support local community members in developing Enterprise Plans (EPs) based on EbA interventions.
2.3.3. Monitor the impacts of EbA interventions.		
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.		
3. Existing knowledge management platforms supported for integrated catchment management and EbA.	3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	3.1.1. Support existing knowledge management platforms responsible for collating, analyzing and disseminating information on climate risks and suitable adaptation options.
		3.1.2. Collect and collate data and information from automated weather stations, agro-ecological extension centers and international publications.
	3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.	3.2.1. Establish an impact evaluation framework to enable the effective quantification of project benefits and to provide information for future planning and implementation of EbA interventions. 3.2.2. Obtain data and information through applying the framework will be disseminated via the knowledge platform(s).

II. POTENTIAL SOCIAL AND ENVIRONMENTAL IMPACTS

The preliminary analysis and screening process (UNDP's Social and Environmental Screening Procedure, or SESP) has

revealed some moderate risks, representing potential limited social and environmental impacts associated with proposed project activities. Planned interventions are unlikely to result in significant negative social and environmental impacts. Most impacts are likely to occur during the construction phase of EbA interventions. These impacts are likely to be minor and without long-term adverse effects. Overall, project activities are designed to enhance the provision of ecosystem services within the KRB, reducing negative environmental impacts and generating multiple associated socio-economic co-benefits for local communities. It is expected that these environmental and socio-economic co-benefits will materialise during the operational phase of the project and persist well beyond project completion.

The Environmental and Social Management Plan (ESMP) that details risk mitigation strategies will be developed during the Inception Phase of project implementation. This ESMF is in line with UNDP's Social and Environmental Standards (SES), which will guide all aspects of project implementation.

These potential impacts are summarized and discussed in the table below (*Table 2: Potential social and environmental impacts and mitigation measures*).

Table 2. Potential social and environmental impacts and mitigation measures.

Activity/ Risk	Potential Social and Environmental Impact	Potential Project Benefit	Mitigation measures	Monitoring
<p>Changes in pasture and livestock management practices and reforestation measures (grazing control, rotational grazing, livestock exclusion zones, rehabilitation and restoration of forest ecosystems).</p>	<p>Project activities could potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups.</p>	<p>Improved livelihoods, health and well-being of target communities. Specifically:</p> <ul style="list-style-type: none"> • Increased pasture productivity and carrying capacity; • Increased provision of food and fodder; • Increased nutrition for local community; • Increased provision of fuel-wood and timber; • Protected crops and livestock from extreme climatic conditions; • Increased bio-diversity conservation; • Increased soil moisture; • Slowed water run-off; 	<p>The project will support grazing control measures (rotational grazing), establish livestock exclusion zones and reforestation measures sites in consultation with target benefiting communities. Cost-effectiveness analysis with mid- to long-term impacts will be carried out to inform communities of anticipated benefits, but to address short-term limitations concerning access to pasture lands and forests, the project will promote alternative business solutions and community enterprise developments that will help communities generate compensating incomes. To further support sustainability of given measures, the project will implement site-appropriate interventions, for example, reducing extensive livestock grazing through enhanced fodder production techniques (within exclusion zones, rotational grazing, on-site production, demonstration plots, etc), increasing productivity of on-site animal husbandry, and establishing watering sites at mid-stream levels of catchment/watershed areas (saving livestock energy in search of water sources in the upstream).</p> <p>To alleviate such a limitation, the project will target degraded forests and pasturelands, and once rotational grazing is put in place and target deforested lands are planted with fast-growing woodlots, the communities will soon begin to benefit more already during the project period, the benefits they would not have been otherwise able to have from degraded assets at the time.</p> <p>The project will engage widely with relevant stakeholders at regional, sub-regional and community levels to agree on rotational routes for transit of larger herds, and eliminate potential compromising of implemented grazing control measures applied locally by large herd owners from other communities, districts and/or regions. <i>Jamoat</i> level monitoring and control mechanisms will be introduced to enforce agreed measures for elimination of land degradation and improving vegetation growth in target pasture lands, and ensure that target communities effectively benefit from project interventions.</p> <p>The project will also introduce energy-efficient stoves into target communities to compensate for limited access to forest resources. While such experience already exists in other regions of</p>	<p>Mid-term review, project monitoring missions.</p>

			<p>Tajikistan applied by partner development agencies/projects, the outcomes vary across projects with different degrees of efficiency needs. The project will assess the best practices and lessons learned and apply enhanced techniques in Kofirnighan river basin.</p> <p>The project will also support the implementation long-term financing of integrated catchment management strategy through PES models that will be developed for each target district. These models will further enable the financing to undertake initiatives that strengthen ecosystem services and build climate resilience with each target district and community. The PES models will be designed based on a combination of regional, international and local best practices. The design will also be informed by the results of existing PES models made use of in Tajikistan. Such models will be accessed through the knowledge hubs that proposed project is supporting (under Outcome 3).</p>	
Planting of more resilient species, using native varieties, for reforestation activities.	There is a risk of potential use of alien and invasive species.	<p>The project will promote rehabilitation and restoration of abandoned and overexploited forestlands and degraded forest ecosystems, and reforestation of areas affected by adverse climatic events.</p> <p>The overall potential benefit will be: Improved and protected livelihoods, health and well-being of target communities. Specifically:</p> <ul style="list-style-type: none"> • Reduced forest degradation; • Increased bio-diversity conservation; • Increased water infiltration; • Increased above-ground biomass (increased plant survival); • Protected crops and livestock from extreme climatic conditions; • Reduced slope instability and risk of minor mudslides and 	<p>The project will promote the use of native and more resilient varieties as a priority, and if needed alien species may be introduced. Certain species may be used for complementary planting (climate resilient crops seed varieties) in reforestation areas to increase vegetation and biological biodiversity, forest protection and restoration. Prior to such introduction, the project will consult relevant experts at CEP, among development partner agencies, and local <i>dehkan</i> and corporate farms on successful examples across the regions. Necessary national environmental standards, norms and procedures of adaptation of intended alien species will be followed and assessed before introduction takes place.</p> <p>While restoration needs are many in each target district within Kofirnighan river basin, the project will consult municipalities and communities to define restoration areas with particular focus on priority areas most vulnerable to water related adverse climatic events.</p> <p>The Project will also support the setting up of a procedure for tracking, monitoring and registration of restoration actions implemented. During the last year of the project an ecological and land use assessment will be carried out to evaluate the rate of success of the restoration.</p>	<p>Organize knowledge sharing hub, document past experiences (successes and failures), informed analysis of regulatory procedures in addressing risks of potential use of alien and invasive species;</p> <p>Mid-term review.</p>

		landslides; <ul style="list-style-type: none"> • Slowed water run-off; • Increased soil moisture; • Reduced soil loss; 		
Sowing of indigenous grass seeds in degraded rangelands	There is a risk of using unproductive and harmful grass seeds. There may be unavailable qualifications for fodder and animal feed species adapted to local conditions and target ecological zones.	<p>The project will promote rehabilitation and restoration of degraded and overgrazed pasturelands.</p> <p>The overall potential benefit will be: improved livelihoods of livestock owners through increased pasture productivity and carrying capacity.</p> <p>Specifically:</p> <ul style="list-style-type: none"> • Increased water infiltration; • Increased above-ground biomass (increased plant survival); • Increased bio-diversity conservation; • Protected crops and livestock from extreme climatic conditions; • Reduced slope instability and risk of minor mudslides and landslides; • Slowed water run-off; • Increased soil moisture; • Reduced soil loss; • Off-site benefits: reduced downstream siltation, flooding and groundwater river pollution. 	<p>In order to address risks of using unproductive and harmful grass seeds, the project will engage with technical specialists institutions (national) and local communities, and jointly carry out:</p> <ul style="list-style-type: none"> • Geo-botanical survey of summer pasturelands; • Study productivity dynamics of fodder producing summer pasturelands; • Development of recommendations for improvement of summer pasturelands in mountainous areas through sowing effective fodder plans. 	<p>Organize knowledge sharing hub, document past experiences (successes and failures), informed analysis of regulatory procedures in addressing risks of potential use of alien and invasive species;</p> <p>Mid-term review.</p>
Establishment of pasture use groups	Unregulated pasture use, rotational grazing and pasture transit routes may affect achievement of less than optimum project results	The project will promote sustainable use of pasturelands that will benefit livestock owners and positively impact on their livelihoods. This will be achieved	The project will support pasture use groups with necessary information and knowledge building on the stock of pasturelands in target areas, and their level of degradation and help them develop pasture improvement plans. The project will involve local authorities in order to agree on alternative transit routes for	Mid-term review; Capacity building workshops; Project monitoring missions.

	in target pasturelands.	through introduction of exemplary pasture management practices, governance and joint community participation schemes.	livestock owners from other communities to address over-grazing of degraded pastures. Supporting pasture use groups will ensure livestock owners bear responsibility in effective implementation of agreed pasture use plans that foresees payment mechanisms to contribute in sustainability of the interventions.	
Harvesting of forest resources by local communities	Unsustainable community harvesting of forest resources may adversely affect project forest areas.	The project will support rehabilitation/restoration of degraded forest ecosystems in areas affected by adverse climatic events. Reforestation activities are designed to also enhance biodiversity and ecosystem services of degraded areas. Reforestation activities will be guided by existing Forest Development Plans and prioritized in consultation with local municipalities and analysis of climate related vulnerabilities across communities. Although, generally across Tajikistan harvesting of forest resources for fuelwood has declined thanks to increased access to electricity supply, the need to save electricity bills may push relatively poor households to continue harvesting forest materials to a certain degree. The project activities will target such communities where harvesting practice continues.	The project will aim to prevent and mitigate aggressive harvesting practices through a wider awareness campaign among communities at <i>Jamoat</i> and district levels, and introduce concrete measures to contain harvesting practices only from healthy forest ecosystems ('sustainable' harvesting). The project will actively engage communities in joint forest management activities, in planting woodlots for fuelwood and timber, implement agroforestry actions to alongside alternative business support (bee-keeping, fodder production, etc), and promote commercial plantations in salinized and degraded lands. The project will provide training for communities concerning suitable fuelwood plantations, fast growing tree species, and share best practices in sustainable use of forest resources. The communities will be supported with commercial plantation of fruit trees and will be introduced with energy-efficient eco-stoves to further reduce the use of wood material in vulnerable communities. Aforementioned EbA measures and techniques will be incorporated into the forestry and integrated catchment management strategies to be developed by the Project.	Mid-term review; Capacity building workshops; Project monitoring missions.
Some of the expected outcomes of the project, particularly the forest restoration component, are sensitive to potential impacts of climate change	The project is directly addressing climate change vulnerabilities and adaptation capacities in the Kofirnighan river basin, and while it directly promotes adaptation measures, adverse impacts of extreme climatic	The project's designed activities directly support implementation of ecosystem-based adaptation, including climate-smart agriculture and sustainable land management in agro-ecological landscapes. Such actions include rehabilitation and restoration of	The project will aim to build climate resilience through development of catchment management strategy to manage and operationalize climate risks at district and <i>Jamoat</i> levels in Kofirnighan river basin. Current and predicted climatic variability has been taken into account during project design. Throughout the inception and implementation phase, any changes in the climate will be taken	Use of climate risk management tools and assessments; Mid-term reviews; Project monitoring missions.

	events (particularly flooding, water run-off) can affect forest and agricultural areas and related livelihoods.	degraded forest ecosystems, vegetation growth support, water retention measures, establishing saxaul plantations, climate-resilient crop seed planting, and others to prevent and mitigate water related adverse climatic events that have typically posed risks to livelihoods and health of target communities.	<p>into account in planning for the implementation of EbA activities. Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. Species will be planted in appropriate seasons to reduce the risk of this impact occurring.</p> <p>As part of Early Warning Systems, the project will develop multi-hazard climate risk models (MHCRM) for vulnerable watersheds in KRB and provide technical support for the modernization of automated weather stations in the most vulnerable districts of KRB. These will help authorities and communities adequately assess risks, climate related projections and incorporate these risks in the Kofirnighan River Basin Management Plans to make informed decisions on EbA activities.</p>	
Construction of small-scale water infrastructure and irrigation systems	Project may involve community safety risks from small-scale construction activities	The Project's ecosystem-based adaptation measures may involve construction of water saving irrigation systems, rain-water harvesting systems in water-scarce zones, rehabilitation of irrigation, draining and pumping systems and on-farm water resources management. These measures will benefit communities for their livelihoods and agricultural productions.	The Project will follow related environmental impact assessment procedures and ensure compliance with national construction standards and norms, sanitary norms and regulations, and other national laws and regulations (forestry, water, environment, and health). The project will also follow technical guidance and best practices regarding rain-water harvesting systems, drip-irrigation techniques, and micro-reservoirs that are not adequately institutionalized across the country. Other activities may include construction of gabions, terracing, bank enforcement and small dams, the project will assess best practices and lessons learned to address community safety risks from such construction.	Mid-term review; Project monitoring missions.
Pest control measures and agricultural support may involve potential use of pesticides	There may be a risk of application of pesticides that may have a negative effect on the environment or human health	The Project will support producers to adopt improved farming techniques (e.g. organic agriculture, soil and water conservation) that would reduce the use of fertilizers and harmful pesticides, thus reducing the contamination of soil and water bodies.	<p>The project will promote safe and healthy agro-ecological practices, and communities will be trained on these through support of agro-ecological extension services at the <i>Jamoat</i> level to provide technical support for EbA implementation.</p> <p>Though not foreseen, but if potentially harmful pesticides are needed and/or will be used, they will be properly managed, stored, used, following national and international standard regulation and procedures.</p>	Mid-term review; Project monitoring missions.
Duty-bearing ministries/agencies and local authorities do not	Capacities of national institutions, district authorities and governance	The project design includes a dedicated component (Component 3) with an extensive	Focal institutions will be strengthened through participatory development of integrated catchment management strategy and Watershed Action Plans for the Kofirnighan river basin.	Capacity building workshops; Exchange visits to

<p>have sufficient expertise and technical/material resources to meet their obligations in the Project.</p>	<p>mechanisms are not sufficient to provide effective (governance) solutions to climate problems that are complex and multi-sectoral.</p> <p>There is a risk that duty-bearing organizations will tend to focus more on mitigation response on consequences of adverse climatic and environmental hazards, rather than on prevention through EbA actions.</p>	<p>set of capacity building actions and knowledge building and sharing at national, regional, local and community levels, based on analysis of institutional framework and related capacities carried out during the project preparation.</p>	<p>Coordination and training mechanisms will be strengthened within target <i>Jamoats</i> (sub-district government level), which includes capacity building on mainstreaming integrated catchment management (with EbA integrated) into planning and budgetary processes. Trainings target relevant government institutions involved in catchment/watershed management, including CEP and Ministry of Energy and Water Resources.</p> <p>In the framework of implementing the water sector reform programme and development of Kofirnighan River Basin Plan under the leadership of the Ministry of Energy and Water Resources, the project will contribute in the river basin development and planning processes through integrating catchment management strategies and watershed action plans with EbA related interventions as necessary.</p>	<p>related sites where partner projects have been implemented; Mid-term review; Project monitoring missions;</p>
<p>Potentially affected stakeholders, in particular marginalized groups, could potentially be excluded from fully participating in decisions that may affect them.</p>	<p>Limitations may exist in the capacities of local stakeholders, in particular poor and vulnerable groups, to participate effectively in decision making that can affect them.</p> <p>Marginalized groups in project area of Kafernigan river basin can be considered poor and vulnerable population that potentially include those living in places with increased impacts of climate change, food insecure households, households with limited or no productive assets (limited resilience), livestock and/or agricultural land plots. Given the relatively higher rates of labor migration among men (to Russian Federation and else), households without manpower, female-headed households, and those with small children and elderly</p>	<p>Marginalized groups in project area of Kofirnighan river basin can be considered poor and vulnerable population that potentially include those living in places with increased impacts of climate change, food insecure households, households with limited or no productive assets (limited resilience), livestock and/or agricultural land plots. Given the relatively higher rates of labor migration among men (to Russian Federation and else), households without manpower, female-headed households, and those with small children and elderly may also be considered vulnerable. Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project design and implementation.</p> <p>The project will implement a number of measures and actions</p>	<p>Prior to project implementation, during inception phase, the project will carry out vulnerability assessment of target communities in participatory manner holding focused consultations in designing specific tailor-made activities suitable for vulnerable and marginalized groups. Where feasible such groups will be prioritized for concrete adaptation interventions. The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women’s committees, intervention related initiative groups, pasture development associations, Water User Associations (WUA), forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized within such groups and associations.</p> <p>Among targeted actions that may be prioritized and suitable for vulnerable groups may include on-farm adaptation interventions, household plots productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) may also be suitable for the given groups to ensure benefits are distributed inclusively and in equitable manner.</p>	<p>Inception assessments; Mid-term review; Consultation workshops; Project monitoring missions.</p>

	may also be considered vulnerable. Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project design and implementation.	that will benefit these groups.		
<p>Women may be excluded from decision-making or not adequately participate in the design/ implementation of the project.</p> <p>As a result, they may have unequal access to resources and/ or access to opportunities and benefits.</p>	<p>Due to high level of male labor outmigration from rural communities, women are overburdened with household management and maintenance of nearby land assets. This may potentially limit women's participation in project consultation and planning processes, but if necessary measures are taken, the increased role of women in agriculture and livestock management at household level may result advantageous to women in the first place.</p>	<p>Project activities will be designed and implemented so that all genders are: (a) able to participate fully and equitably, (b) receive comparable social and economic benefits, (c) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy.</p>	<p>Designed project activities will be implemented so that all genders are: (a) able to participate fully and equitably, (b) receive comparable social and economic benefits, (c) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy.</p> <p>A more detailed gender analysis will be undertaken in the inception phase of the project to assess divisions of labor and women's role and access to resources and to develop recommendations on how project will promote women's equality and empowerment, including participation in project decision-making, as outlined in the ESMF.</p> <p>For this purpose, based on a detailed gender analysis, and in consultation with target communities that have prioritized their sub-projects, a comprehensive Gender Action Plan will be developed that will state out requirements to ensure that SES are met. The requirements and measures will ensure that women receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and therefore enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing women's views.</p> <p>For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated. Furthermore, when possible, measures and techniques that can have a positive impact by closing the gap of inequality between men and women will be promoted.</p>	<p>Gender assessment; Use of disaggregated and measurable indicators related to gender equality and women's empowerment; Capacity building workshops; Mid-term review; Project monitoring missions.</p>

III. NATIONAL POLICY FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL MATTERS

i. National policies, plans, strategies and development goals

The table below outlines the relevant national and sub-national policies, plans, strategies and development goals.

Table 3. National policies, plans, strategies and development goals

Strategy	Year enforced	Alignment
National strategies		
National Development Strategy 2016–2030 (NDS)	2016	<p>The primary focus of the NDS is on the long-term development of Tajikistan to improve living standards for the population. NDS objectives to achieving this include: i) poverty eradication; ii) sustainable economic growth; iii) promotion of sustainable consumption and production patterns; and iv) sustainable use of natural resources.</p> <p>The vulnerability of the Tajik population to climate change is acknowledged throughout the NDS, with the importance of agriculture and water management to alleviating this is highlighted.</p> <p>Outcome 1 and 2 of the project therefore align with achieving the ultimate goal of the NDS in the country.</p>
National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (CBD Strategy)	2003	<p>Several interconnected components contribute to the primary objective of the CBD Strategy.</p> <p>A priority element of the ‘geosystem-level approach’ outlined in the CBD Strategy is the restoration and reforestation of degraded landscapes to reduce soil erosion, particularly in landslide and already eroded areas.</p> <p>Outcome 2 is aligned with this strategic component through implementing EbA activities that contribute to restoration and reforestation in degraded landscapes.</p>
National Strategy on Disaster Risk Management for 2010–2015 (NDRMS)	2010	<p>The NDRMS identifies the significance of climate change-related disasters in the country such as droughts and high-water events. It is also acknowledged in the strategy that mitigation for these types of events needs to be incorporated into the design phase of new development projects.</p> <p>The project is therefore aligned with the NDRMS under Outcome 1, relating to integrated catchment management which includes the improvement of water monitoring systems.</p>
The National Climate Change Adaptation Strategy (NCCAS)	2016	<p>Within the NCCAS there are guidelines provided for priority adaptation actions to be undertaken in Tajikistan. The proposed project is well-aligned with the NCCAS because they both recognize that climate change effects on the agricultural sector result in significant negative impacts for the population. The NCCAS also recognizes the potential of EbA as an effective adaptation approach.</p> <p>The NCCAS is currently in draft format and has not yet been accepted by the government. Notwithstanding this information, the proposed project is aligned with the NCCAS through both Outcome 1 and 2.</p>
National programmes and plans		
National Programme of Actions to Combat Desertification (NPACD)	2001	<p>Outcome 2 of the project aligns with the NPACD focus on ‘rational land tenure’ and ‘measure on rational nature using’. These focal points refer to the sustainable use of natural resources, with clear guidelines on reforestation and mitigating the effects of water erosion.</p> <p>Outcome 3 aligns with two further objectives of the NPACD, namely: i) the development of better platforms to disseminate climate change information; and ii) increasing the role of the local population in collecting and collating data.</p>
Strategic Programme for Climate Resilience (SPCR)	2011	<p>The SPCR was developed in response to the specific vulnerability of Tajikistan to climate change and the associated economic, environmental and social impacts. It is the strategic overview of the Pilot Programme for Climate Resilience (PPCR), which consists of six core components. One of these core components is ‘Agriculture and sustainable land management’, which focusses on incorporating climate resilience into all sectors of land management.</p> <p>Outcome 2 of the proposed project has a strong alignment with this component.</p>
National Action Plan for Climate Change Mitigation (NAPCC)	2003	<p>The NAPCC is the only strategic framework in the country that specifically addresses the implications of climate change. All outcomes of the project are strongly aligned with the NAPCC.</p>
National Environmental Action Plan (NEAP)	2006	<p>The NEAP focusses on a broad spectrum of current environmental concerns, many of which are likely to be exacerbated by climate change. Amongst the most prevalent concerns included in the NEAP include: i) soil erosion; ii) deforestation and land degradation; iii) high water events; and iv) water scarcity.</p> <p>Outcome 1 and 2 of the project align with these concerns. The NEAP also recognizes the need to</p>

Strategy	Year enforced	Alignment
		improve environmental knowledge in Tajikistan at both institutional and local levels, which is complemented in Outcome 3 of the project.
Agricultural Reform Programme of the Republic of Tajikistan for 2012–2020	2012	<p>The Agricultural Reform Programme includes a direct focus on mitigating the negative impacts of climate change for agricultural production. This includes the primary activity of ‘systematic reduction of soil erosion, land degradation and deforestation by improving natural resources management’. The programme includes a focus on EbA strategies with emphasis on soil erosion activities.</p> <p>Both Outcome 1 and 2 of the project align with these focal points of the Agricultural Reform Programme.</p> <p>Another important component of the programme is the ‘development and establishment of information management systems that would enable communities, local and national authorities to effectively collect, record and analyze reliable information on the impact of natural disasters and climate change’. Outcome 3 of the project is strongly aligned with this component.</p>
Strategies with a focus on climate change		
Greenhouse Gas Abatement Strategy (GHG Strategy) included in the NAPCC	2003	<p>In order to meet the UNFCCC commitments for Tajikistan, the GHG Strategy was developed with the focus to address the problem of source-based anthropogenic emissions.</p> <p>Outcome 2 of the proposed project aligns with the objective of promoting sustainable forms of agriculture in light of climate change considerations.</p> <p>Additionally, Outcome 2 aligns with the priority of enhancing natural sinks of carbon including forests and soils.</p>
Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects (Adaptation Strategy) included in the NAPCC	2003	<p>In order to meet the UNFCCC commitments for Tajikistan, the Adaptation Strategy was included within the NAPCC to ensure that climate change adaptation remained a focal point for development in the country.</p> <p>Outcome 2 and 3 of the project align with the following components of the strategy:</p> <ul style="list-style-type: none"> • improvement of systematic observation and monitoring network for ensuring timely adjustment of adaptation measures; and • improvement of the data collection system and analysis, interpretation and dissemination of the results among the end users. <p>Outcome 1 of the project is aligned with two of the priorities relating to water resources:</p> <ul style="list-style-type: none"> • development of measures in the field of water resources protection, water and energy saving in the conditions of climate change; and • development of new, and improvement of existing technical and economical tools on water use at national and regional levels. <p>In addition, Outcome 2 of the project aligns with four of the five ‘measures of adaptation and minimisation of adverse impacts of climate change’ relating to land use. These are listed below.</p> <ul style="list-style-type: none"> • Zoning of territory depending on the extent and type of influence of climatic factors on the condition of lands taking into account its vulnerability to the different forms of erosion. • Setting a selection of soil protection measures for specific landscapes according to the influence of climatic and anthropogenic factors. • Conducting land-reclamation measures, which include crop rotation, soil protection and limiting the ploughing of steep lands that will help to conserve the humus in the soils under the expected conditions of climate change. • Forest rehabilitation measures in the regions prone to drought and wind erosion.
Laws		
Land Code of The Republic of Tajikistan (Land Code)	1996	<p>The Land Code regulates all land relations and is directed at the rational use and protection of land, improving the fertility of soil, maintenance and improvement of the natural environment and for equal development of all forms of economic activity in Tajikistan.</p> <p>According to the Land Code, provision of land plots to legal entities and individuals is carried out on the basis of resolutions of the relevant executive authorities in accordance with Article 26 of the Land Code.</p> <p>In the case of the project, if tree or any other crop planting is to be undertaken the decision will be taken by district hukumat based on the recommendation of the district level land committee upon consent of the land user (Source: Land Code Article 22. The procedure for granting land).</p>
Water Code of The Republic of Tajikistan (Water Code)	2000	<p>The Water Code is aimed at regulating water relations to ensure rational use. This is so that there is adequate supply for the needs of the population and the natural environment.</p> <p>Decisions pertaining to the work on rehabilitation of irrigation and water pumping stations will be conducted in accordance with provisions of the Water Code and will be agreed upon and coordinated with the Agency for Land Reclamation and Irrigation.</p>
Law of the Republic of Tajikistan on Land	1994	<p>The tasks of land reform in the Republic of Tajikistan are the: i) creation of conditions for equal rights for the development of the various forms of managing land; ii) formation of multi-structural</p>

Strategy	Year enforced	Alignment
Reform (Land Reform Law)		economy; iii) rational use of land and land protection to increase agricultural production. The project will adhere to this Law in its cooperation with <i>dehkan</i> farms as land users, in the implementation of interventions related to establishing commercial plantations, organic mulching, dry-tolerant crops, horticulture, etc.
Law of the Republic of Tajikistan on Land Management (Land Management Law)	2001	The objectives of land management in the Republic of Tajikistan include: i) creation of conditions for equal development of different forms of economies on the land; ii) formation of plural economies; iii) rational land tenure and protection of land to increase agricultural production. The project will adhere to this Law in its cooperation with <i>dehkan</i> farms as land users, in the implementation of interventions related to establishing commercial plantations, organic mulching, dry-tolerant crops, horticulture, etc. Project activities will, at all times, respect existing land tenure. Wherever possible, project activities will seek to strengthen existing land tenure arrangements through stakeholder engagement.
Law on Environmental Protection	2011	This Law determines and regulates the state policy in the field of environmental protection, and is aimed at providing sustainable social and economic development, guarantee of human rights for the healthy and favorable environment, strengthening of law and order, prevention of negative impact of economic and other activity on the environment, the organization of rational use of natural resources, and providing ecological safety. The project interventions (such as tree planting, establishment of <i>saxaul</i> plantations etc.) will facilitate the enforcement of provisions set within the framework of this Law.
Law on Ecological Expertise	2012	The present Law regulates general order of the organization and carrying out of ecological expertise, establishes the rights and the obligations of the parties engaged in carrying out ecological expertise, establishes the rights of the citizens to access information on ecological danger of the objects in the course of the project (under construction and put into operation), describes the modalities of appeal against the resolution and dispute settlement, and establishes liability for the infringement of the legal norms and regulations. Currently, project interventions do not entail any activities that fall under regulation of this Law. In the event such an activity is identified in the course of project implementation, the project will ensure adherence to the conditions stipulated within the framework of this Law.
Law on Pastures	2013	The Law on Pastures stipulates measures for the rational utilization, enrichment and sustainable development of natural pastures for use by livestock, and the avoidance of degradation and destruction of pastures. The Code defines measures to ensure that rational utilization is based according to a number of prescriptions, including determination of carrying capacity, regulations regarding use of pastures, measures to enhance productivity and sustainability of lands, and the collective role of local government entities and grazing right holders or lessees in the effective management of these lands. The project interventions related to pasture management, specifically pasture rotation, establishing livestock exclusion zones for the growing of fodder crops, pasture management such as land-use planning will facilitate the enforcement of provisions set within the framework of this Law.
Law on Dekhan Farms (Dekhan Law)	2016	The Law defines the legal basis for organization and activity of <i>Dehkan</i> farms in the Republic of Tajikistan. The <i>Dehkan</i> farm is “an independent managing subject carrying out its activities being not a legal person and based on individual business of a person, or members of the one family and other citizens jointly producing agricultural commodities on the basis of the plot of land and other properties being in its possession”. Within the regulations of this Law, agreement on the specific project interventions (like drip irrigation, commercial plantation, horticulture, crop diversification, crop rotation, establishing farmer field schools, etc.) will be individually sought with concerned <i>dehkan</i> farms in coordination with district <i>hukumats</i> , depending on the location of sites. Such agreement will be facilitated through community-level stakeholder meetings during the project Inception Phase.

ii. Consistency with national technical standards

The project will adhere to all relevant national technical standards, in accordance with the legislation outlined in 2.2 above. At the Full Proposal development stage, the following legislation has been identified with relevance to the proposed activities:

- the 1996 Land Code of The Republic of Tajikistan;
- the 2000 Water Code of The Republic of Tajikistan;
- the 2001 Law of the Republic of Tajikistan on Land Management;
- the 2001 Law About Environmental Protection; and

- the 2012 Law on Ecological Expertise.

Details about the relevance of each legislation to the proposal are listed in 2.2 above. Given the small scale of the project’s EbA interventions in the target sites and communities, as well as their focus on environmental protection, Environmental Impact Assessments (EIAs) are not expected to be necessary for any of the planned interventions. In addition, the proposed projects activities are in line with national social norms, including gender equality and equal access.

IV. UNDP SOCIAL AND ENVIRONMENTAL STANDARDS

UNDP’s Social and Environmental Standards (SES) have been applied during development of the project. The SES objectives are to: i) strengthen the social and environmental outcomes of programmes and Projects; ii) avoid adverse impacts to people and the environment; iii) minimize, mitigate, and manage adverse impacts where avoidance is not possible; iv) strengthen UNDP and partner capacities for managing social and environmental risks; and v) ensure full and effective stakeholder engagement, including through a mechanism to respond to complaints from project-affected people.

UNDP will not support activities that do not comply with national law and obligations under international law, whichever is the higher standard (hereinafter "Applicable Law"). UNDP seeks to support governments to adhere to their human rights obligations and empower individuals and groups, particularly the most marginalized, to realize their rights and to ensure that they fully participate throughout UNDP’s programming cycle.

Table 4: Elements of UNDP’s Social and Environmental Standards (SES)

Overarching Policy	Project-Level Standards	Policy Delivery Process & Accountability
<p>Principle 1: <u>Human Rights</u></p> <p>Principle 2: <u>Gender Equality and Women’s Empowerment</u></p> <p>Principle 3: <u>Environmental Sustainability</u></p>	<p>Standard 1: <u>Biodiversity Conservation and Sustainable Natural Resource Management</u></p> <p>Standard 2: <u>Climate Change Mitigation and Adaptation</u></p> <p>Standard 3: <u>Community Health, Safety and Working Conditions</u></p> <p>Standard 4: <u>Cultural Heritage</u></p> <p>Standard 5: <u>Displacement and Resettlement</u></p> <p>Standard 6: <u>Indigenous Peoples</u></p> <p>Standard 7: <u>Pollution Prevention and Resource Efficiency</u></p>	<p>Quality Assurance</p> <p>Screening and Categorization</p> <p>Assessment and Management</p> <p>Stakeholder Engagement and Response Mechanism</p> <p>Access to Information</p> <p>Monitoring, Reporting, and Compliance review</p>

UNDP’s SES have been reviewed and it was determined that the SES address the requirements of the Adaptation Fund’s Environmental and Social Policy. The project was screened with UNDP’s Social and Environmental Screening Procedure (see Annex 6) which resulted in a “Moderate” overall project social and environmental risk categorization. The following UNDP Social and Environmental Standards are considered triggered by the project:

- Principle 1: Human Rights
- Principle 2: Gender Equality and Women’s Empowerment
- Principle 3: Environmental Sustainability
- Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management
- Standard 2: Climate Change Mitigation and Adaptation
- Standard 3: Community Health, Safety and Working Conditions
- Standard 5: Displacement and Resettlement
- Standard 7: Pollution Prevention and Resource Efficiency

The Standards are underpinned by an Accountability Mechanism with two key functions:

- A Stakeholder Response Mechanism (SRM) that ensures individuals, peoples, and communities affected by UNDP projects have access to appropriate procedures for hearing and addressing project-related grievances; and
- A Compliance Review process to respond to claims that UNDP is not in compliance with UNDP’s social and environmental policies.

Prior to project approval, the Full Proposal has been screened according to the UNDP Social and Environmental Safeguards Procedure. This is to ensure that the necessary safeguards have been addressed and incorporated into the project design. The final Full Proposal will include the completed quality assessment and social and environmental safeguards templates.

V. ESMF REQUIREMENTS AND PROCEDURES FOR SCREENING, ASSESSMENT AND MANAGEMENT

i. Objectives and Requirement of the ESMF

The purpose of this section is to ensure that project activities, once fully defined, are screened for risks and appropriate assessment and management measures are adopted. In addition, it serves as a “commitment plan” listing the key assessments and management plans that will need to be undertaken and budgeted for. This includes plans mandated by the UNDP SES, where relevant.

The ESMF identifies potential social and environmental risks and impacts from project activities and outlines strategies and procedures for identifying risks and impacts from as yet fully defined project components and for managing those risks and minimising undesirable environmental and social impacts. Further, the ESMF identifies stakeholder engagement processes and a Grievance Redress Mechanism for stakeholders with concerns and/or complaints regarding the project.

An ESMF is a management tool used to assist in addressing potential adverse social and environmental impacts associated with project activities. To ensure the environmental and social objectives of the projects are met and adverse impacts are avoided and/or mitigated, the present ESMF will be used by the project implementers. The ESMF identifies steps for screening potential social and environmental issues and impacts of particular project activities as their specific locations are further defined and for preparing and approving appropriate action plans for avoiding, and where avoidance is not possible, reducing, mitigating, and managing adverse impacts.

The objective of ESMF is to identify environmental and social impacts and risks associated with the sub-projects defined in target communities of Kofirnighan river basin. This will allow the project implementation teams (National Project Team, national and local authorities) to identify and implement appropriate risk mitigation measures. In addition, the ESMF aims to:

- Increase climate resilience and adaptive capacity of Kofirnighan river basin municipalities and target communities;
- Implement on the ground ecosystem-based adaptation measures for forest, land and water resources management in the targeted areas;
- Strengthen knowledge building, information management, and monitoring systems on climate change vulnerability and adaptive capacity;
- Promote sustainable livelihoods, health and wellbeing of target communities, and management practice in utilization of natural resources;
- Describe all monitoring procedures required to identify social and environmental impacts;
- Adopt the best practicable means available to prevent or minimize environmental and social impact; and
- Ensure compliance with all applicable laws, regulations and standards for the protection of environment.

ii. Screening Procedures of the ESMF

Prior to project implementation, activities will be screened against an agreed “negative list”. Potentially the following sub-project or activities will be deemed ineligible for the ecosystems-based adaptation measures in the Kofirnighan river basin if they:

- Involve significant conversion or degradation of natural habitats (forest ecosystems, pasturelands, etc);
- May cause measurable adverse impacts to critical natural habitats;
- Risk the introduction of alien and potentially invasive alien species;
- May negatively affect endangered species;
- Involve physical displacement of people;
- Do not comply with construction norms and standards;
- Purchase, application or storage of harmful pesticides or hazardous materials;
- Production or activities involving forced labor/ harmful child labor; and
- Production or trade in wood or other forestry products from unmanaged forests.

The final sub-projects to be funded will be selected based on the following performance criteria: (a) degree to which the sub-project addresses the adaptation needs identified in the KRB; (b) cost-effectiveness; (c) ease of implementation; and (d) innovativeness. These criteria will be updated and finalized during the project inception phase.

The project includes a number of sub-projects under Component 2 and their specific locations that remain to be fully defined and assessed. Based on developed Watershed Action Plans, specific locations (communities) for EbA measures will be selected and concrete activities from the list below (Table 5) will be prioritized.

Table 5. EbA measures identified as successful/ potentially successful in the KRB. In the ‘Applicable area’ column, ‘N’ denotes the northern sub-basin while ‘S’ denotes the southern sub-basin.

No.	Description	Applicable area
1	Construction of ‘protection’ gabions along rivers to provide buffers during flash floods.	N,S
2	The introduction of water-saving irrigation techniques such as drip irrigation, dry farming, composting/mulching and making use of cover crops.	N, S
3	Rehabilitation/restoration of degraded forest ecosystems making use of <i>saxaul</i> species, as well as others.	N, S
4	Sustainable harvesting for livelihoods from existing ‘healthy’ forest ecosystems.	N
5	Establishing livestock exclusion zones for the growing of fodder crops such as lucerne and sainfoin.	N, S
6	Establishing shelterbelts and integrating bio-drainage measures to reduce wind erosion and improve water infiltration.	N, S
7	Introducing indigenous and palatable grass seeds into degraded rangelands.	N, S
8	Introducing rotational grazing of livestock between pastures to assist with increasing field water absorption and decreasing water runoff.	N, S
9	Pasture management such as land-use planning and introducing improved management measures such as exclusion zones and rotational grazing of livestock.	N, S
10	Establishing joint forest management involving communities and local government.	N, S
11	Introducing intercropping and agroforestry, and in specific areas may include apiculture, i.e. beekeeping.	N, S
12	Introducing sustainable long-term community services such as renewable energy and energy-efficient stoves.	N, S
13	Setting up shelterbelts in areas frequently exposed to erosion.	S
14	Establishing commercial plantations making use of an array of indigenous fruit species in lucerne and degraded lands.	S
15	Introducing organic mulching for farmers to use on croplands which promotes soil fertility as well as water-saving.	S
16	Diversifying crop use, including drought-tolerant and climate-resilient crops.	S
17	Establishing greenhouses for horticulture including local lemon, tomato and cucumber.	S
18	Establishing community woodlots in lucerne and abandoned areas for fuelwood.	S
19	Providing additional and improving existing extension services provision which will include developing advisories for farmers.	S
20	Establishing on-farm water resource management.	S
21	Rehabilitating existing irrigation, drainage and pumping systems.	S

Once the project activities are fully specified, the project SESP will be updated to review the fully specified components and to determine whether additional social and environmental impacts may be present and need to be assessed and managed. Where the screening of the fully defined projects components identifies potential social and environmental risks that could be categorized as High Risk, these components will be redesigned to eliminate and/or minimize such risks. The SESP will also be updated in there are any significant changes in the project's design or context that may materially change its social and environmental risk profile.

iii. Assessment and Management of Environmental and Social Risks and Impacts

The targeted assessments/site-specific assessments/comprehensive Environmental and Social Impact Assessment (ESIA) will be undertaken once project activities/sub-projects and sites are fully defined. The assessment(s) will be conducted in a manner consistent with national regulations and the UNDP SES and lead to the development of appropriately scaled management measures and plans to address the identified risks and impacts.

The UNDP SES and SESP require that in all cases required social and environmental assessments and adoption of appropriate mitigation and management measures must be completed, disclosed, and discussed with stakeholders prior to implementation of any activities that may cause adverse social and environmental impacts.

Environmental and Social Impact Assessment (ESIA) is carried out to identify and predict impacts of proposed sub-project activities. The process includes: (a) impact screening, (b) scoping, (c) prediction and mitigation; (d) management, monitoring and evaluation. The ESIA defines the degree to which the benefits of the potential future project activities will be distributed in an equitable manner across the affected population and examine opportunities to enhance social inclusion, social accountability, strengthen social cohesion, increase social capital, and build ownership as per AF principles.

In addition, the following targeted assessments and mitigation/management measures will be required:

- Gender analysis in the initial phase of the project to assess divisions of labor and women's role and access to resources in order to develop recommendations on how the project will promote women's equality and empowerment.
- Marginalized and vulnerable groups assessment in the project inception to prioritize communities and groups for adaptation interventions.
- Ecological and land use assessment to evaluate the rate of success of the forest restoration activities.
- Pasture use assessment with indication of degree of degradation, over-grazing, and successful experience in pasture restoration activities across the country.

Table 6. Checklist for environmental and social principles for the proposed project.

Checklist of Environmental and Social Principles	Potential impacts and risks	Mitigation measures
<i>Compliance with the Law</i>	<i>No further assessment required</i>	Project activities will be undertaken in compliance with the domestic laws of Tajikistan and with all relevant international laws.
<i>Access and Equity</i>	<i>Project activities could restrict availability and/or quality of, and access to, resources or basic services – in particular, to marginalised individuals or groups.</i>	<p>Project activities will be designed to provide fair and equitable access to benefits in a manner that is inclusive. Activities will not exacerbate existing inequities, particularly with respect to marginalised or vulnerable groups.</p> <p>Tajikistan’s livestock population continues to increase annually and poses a great stress on degrading pastureland resources with very limited fodder production available nationally and at district levels. Communities have reported that current areas of pasturelands are not sufficient to support the current livestock populations. Therefore, the project will support grazing control measures (rotational grazing), establish livestock exclusion zones and reforestation measures sites in consultation with target benefiting communities. Cost-effectiveness analysis with mid- to long-term impacts will be carried out to inform communities of anticipated benefits, but to address short-term limitations concerning access to pasture lands and forests, the project will promote alternative business solutions and community enterprise developments that will help communities generate compensating incomes. To further support sustainability of given measures, the project will address the need to reduce extensive livestock grazing through enhanced fodder production techniques (within exclusion zones, rotational grazing, on-site production, demonstration plots, etc), productive on-site animal husbandry, and establishment of watering sites at mid-stream levels of catchment/watershed areas (saving livestock energy in search of water sources in the upstream).</p> <p>The project will engage widely with relevant stakeholders at regional, sub-regional and community levels to agree on rotational routes for the transit of larger herds and eliminate potential disregards of implemented grazing control measures applied locally by large herd owners from other communities, districts and/or regions. Jamoat level monitoring and control mechanisms will be introduced to enforce agreed measures for elimination of land degradation and improving vegetation growth in target pasture lands, and ensure that target communities effectively benefit from project interventions.</p> <p>The project will also introduce energy-efficient stoves into target communities to compensate for limited access to forest resources. This project will assess best practices and lessons learned from other development projects introducing cookstoves and apply enhanced techniques in Kofirnighan river basin.</p>
<i>Marginalized and Vulnerable Groups</i>	<i>Marginalised groups could potentially be excluded from fully participating in decisions that may affect them.</i>	<p>Project activities have taken into account marginalised and vulnerable groups – including children, women and girls, the elderly, indigenous people, displaced people, people living with disabilities, and people living with HIV/AIDS.</p> <p>Marginalized groups in project area of Kofirnighan river basin can be considered poor and vulnerable individuals and include those living in places with increased impacts of climate change, food insecure households, households with limited or no productive assets (limited resilience), livestock and/or agricultural land plots. Given the relatively higher rates of labour migration among men, households without manpower, female-headed households, and those with small children and elderly people may also be considered vulnerable. Often, such vulnerable groups have limited mobility to participate during key stages of project design and implementation.</p> <p>Prior to project implementation, during inception phase, the project will carry out localised vulnerability assessments of target communities in a participatory manner for tailor-made activities suitable to the local context. Where feasible, such groups will be prioritised for concrete adaptation interventions. The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women’s committees, intervention related initiative groups, pasture development associations, Water User Associations (WUA), forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized people within such groups and associations.</p>

		<p>Targeted actions that may be prioritized and suitable for vulnerable groups include on-farm adaptation interventions, household plot productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) may also be suitable for the given groups to ensure benefits are distributed inclusively and in equitable manner.</p>
<i>Human Rights</i>	<i>No further assessment required</i>	<p>Project activities will respect and, where applicable, promote international human rights.</p> <p>Tajikistan is the most vulnerable country to climate change in Central Asia. Negative effects of climate change on the Tajik population include glacial and permafrost melt, increased rainfall intensity and longer and more frequent dry spells. Together, these effects have increased the rate of topsoil erosion, threatening the livelihoods, health and wellbeing of the population. Losses from natural hazards currently amount to ~20% of the country's GDP and climate change impacts are predicted to increase the frequency and magnitude of such losses. In the future, loss amounts are expected to rise from ~US\$50 million in 2014 to ~US\$132 million by 2030. Approximately 33% of all agricultural losses in the country are currently attributable to climate change and variability.</p> <p>Furthermore, it has been projected that crop yields in Tajikistan will decrease by an additional 5–30% by 2050, with the potential for severe negative impacts on the country's economy. Moreover, by 2050, ~77% of the country's population will be living in areas most exposed to the impacts of climate change. Tajikistan's vulnerabilities are attributed to the country's weak social structures, low adaptive capacity, underdeveloped infrastructure, low income insecurity, poor service provision, strong dependence on agriculture and institutional constraints.</p> <p>To address these challenges, the project will support Tajikistan's authorities and target population to enhance the climate resilience amongst small-scale farmers and pastoralists of Kofirnighan River basin. Improving the climate resilience of these communities will involve developing a climate-resilient catchment management strategy to inform the planning and development of rural areas in adapting to the increasing impacts of climate change. Interventions will also promote sustainable management of natural resources through an integrated landscape approach to catchment management. The project will directly benefit an estimated 46,000 individuals who are especially vulnerable to the impacts of climate change, through the design and implementation of concrete on-the-ground EbA interventions for more efficient natural resources management. These measures will also provide social and economic benefits to target population in terms of livelihoods, health and wellbeing of the population. In terms of human rights mainstreaming, the impact is multidimensional in nature and addresses the right to food, energy, water, health, etc.</p> <p>In particular, the project's interventions have the following social and economic benefits for target population: (a) increased profit margins and farm income, (b) reduced loss of crops and land caused by slope instability, drought or dry spells and also caused by ineffective agricultural practices and livestock grazing/breeding; (c) reduced agricultural inputs, water consumption and thus production costs; (d) reduced risk of economic failure due to diversification of production on and off-farm; (e) reduced crops susceptibility to pests; (f) increased nutrition and food security for local communities; (g) increased provision of fuelwood and timber and reduced loss of trees to drought or dry spells; and (h) increased pasture productivity, fodder production and carrying capacity. In addition, the project interventions increase nonmaterial benefits such as ecosystem services such as tourism and recreation, derived from increased conservation value of the landscape.</p> <p>Throughout the project implementation period, the project will seek to ensure that benefits of the project are shared broadly in a non-discriminatory and equitable manner. The project will ensure that all relevant stakeholders participate in decision-making processes and consultations, and that such participatory processes are transparent. Necessary strategies, action plans, site selection criteria and lessons learned will be documented and shared regularly through community driven consultation platforms that the project will seek to facilitate.</p>

		<p>A wide range of stakeholders were consulted with during the scoping and validation phase of proposed project development. Importantly, the project's Executing Entity, the Committee for Environmental Protection (CEP), was consulted through the iterative process of refining the project design. As the national organisation responsible for implementing adaptation projects in the country, the CEP is comprised of numerous technical experts. Therefore, the CEP is well-positioned to ensure that the project design is tailored to local requirements, that it benefits vulnerable groups and includes necessary gender considerations. A Validation Workshop was held in Dushanbe on 22 June 2018 that included representatives from relevant Kofirnighan river basin districts, international organisations, academia and partner projects.</p>
<i>Gender Equity and Women's Empowerment</i>	<p><i>Women may not be adequately represented with regards to decision-making or participation in the design/implementation of the project's activities. As a result, they may have limited access to resources, opportunities and benefits.</i></p>	<p>Project activities will be designed and implemented so that all genders are: i) able to participate fully and equitably; ii) receive comparable social and economic benefits; and iii) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy. A gender analysis will be carried out during the Inception Phase of the proposed project to ensure this.</p> <p>Tajikistan has a relatively high Gender Inequality index rating (0.36) with women's labor force participation rate of 58.9 percent, compared to men at 77.1 percent. Despite the nearly equal population ratio of man and women in rural Tajikistan, the relatively higher rates of labor migration among men, leaves rural women typically with triple work burden: employment for income, household and care responsibilities, and growing food for consumptions. Thus the project will ensure that women are active members of community organizations and sub-project stakeholder participation groups members taking part in the decision making processes to ensure that benefits are distributed equitably and fairly among men and women in target zones.</p> <p>The project anticipates that at least 50% of beneficiaries will be women. The stakeholder participation mechanisms for sub-project formulation and implementation will include provisions to ensure that women are able to represent their interests effectively, and the social impact indicators and corresponding targets of the project will be gender-sensitive, ensuring that women receive an equitable share of benefits and that their status and interests are not marginalized.</p> <p>A gender analysis will be undertaken in the initial phase of the project to assess divisions of labor and women's role and access to resources and to develop recommendations on how the project will promote women's equality and empowerment, including participation in project decision-making, as outlined in the ESMF.</p> <p>Measures will ensure that women receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and therefore enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing women's views.</p> <p>For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated. Furthermore, when possible, measures and techniques that can have a positive impact by closing the gap of inequality between men and women will be promoted.</p>
<i>Core Labour Rights</i>	<i>No further assessment required</i>	Project activities will observe the core labour standards of Tajikistan as well as those identified by the International Labour Organisation.
<i>Indigenous Peoples</i>	<i>No further assessment required</i>	Project activities will be designed in accordance with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable national and international instruments relating to indigenous people.
<i>Involuntary Resettlement</i>	<i>No further assessment required</i>	Project activities will not cause any involuntary resettlement of communities.
<i>Protection of Natural</i>	<i>No further assessment</i>	Project activities will not involve any conversion or degradation of critical natural habitats, including those that are:

<i>Habitats</i>	<i>required</i>	i) legally protected; ii) officially proposed for protection; iii) recognised by authoritative sources for high conservation value, including as critical habitats; or iv) recognised as protected by traditional or indigenous local communities.
<i>Conservation of Biological Diversity</i>	<i>There is a risk that alien and/or invasive alien species are used in reforestation activities.</i>	The Project will be supporting activities in environmentally sensitive areas, but this work will aim at reducing impacts in these areas with a net positive impacts. Project activities will be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.
<i>Climate Change</i>	<i>No further assessment required</i>	Project activities will not result in any significant or unjustified increase in GHG emissions or other drivers of climate change. The project's designed activities directly support implementation of ecosystem-based adaptation, including climate-smart agriculture and sustainable land management in agro-ecological landscapes. Such actions include rehabilitation and restoration of degraded forest ecosystems, vegetation growth support, water retention measures, establishing saxaul plantations, climate-resilient crop seed planting, and others to prevent and mitigate water related adverse climatic events that have typically posed risks to livelihoods and health of target communities. Current and predicted climatic variability has been taken into account during project design. Throughout the inception and implementation phase, any changes in the climate will be taken into account in planning for the implementation of EbA activities. Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. Species will be planted in appropriate seasons to reduce risk of hazard impact. The project also aims to build climate resilience through development of a catchment management strategy to manage and operationalize climate risks at district and Jamoat levels in Kofirnighan river basin. The project will develop multi-hazard climate risk models (MHCRM) for vulnerable watersheds in KRB and provide technical support for the modernization of automated weather stations in the most vulnerable districts of KRB. These will help authorities and communities adequately assess risks, climate related projections and incorporate these risks in the Kofirnighan River Basin Management Plans to make informed decisions on EbA activities.
<i>Pollution Prevention and Resource Efficiency</i>	<i>The application of pesticides may have a negative effect on the environment or on human health.</i>	Project activities will be designed and implemented in a way that meets applicable international standards for maximising energy efficiency and minimising material resource use, the production of wastes, and the release of pollutants. Project interventions are not expected to produce any significant amounts of waste or other pollutants. Any potential opportunities identified for improved resource efficiency and pollution reduction during the project development phase will be captured in the project design. The Project will support communities to adopt improved farming techniques (organic agriculture, soil and water conservation, more resilient crop varieties) that would reduce the use of fertilizers and pesticides. Although biological pest control will be preferred, potentially harmful pesticides may be needed for specific use. In this particular case, they will be properly managed, stored, and used in accordance with national and international standards, regulations and procedures.
<i>Public Health</i>	<i>Small-scale construction activities under the proposed project may pose safety risks to community members implementing them.</i>	The Project will follow related environmental impact assessment procedures and ensure compliance with national construction standards and norms, sanitary norms and regulations, and other national laws and regulations (forestry, water, environment, and health). The project will also follow technical guidance and best practices regarding rain-water harvesting systems, drip-irrigation techniques, and micro-reservoirs that are not adequately institutionalized across the country. Other activities may include construction of gabions, terracing, bank enforcement and small dams, the project will assess best practices and lessons learned to address community safety risks from such construction.
<i>Physical and Cultural Heritage</i>	<i>No further assessment required</i>	Project activities have been designed so as to avoid the damage to, or removal of, any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level.
<i>Lands and Soil Conservation</i>	<i>No further assessment required</i>	Project activities will be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.

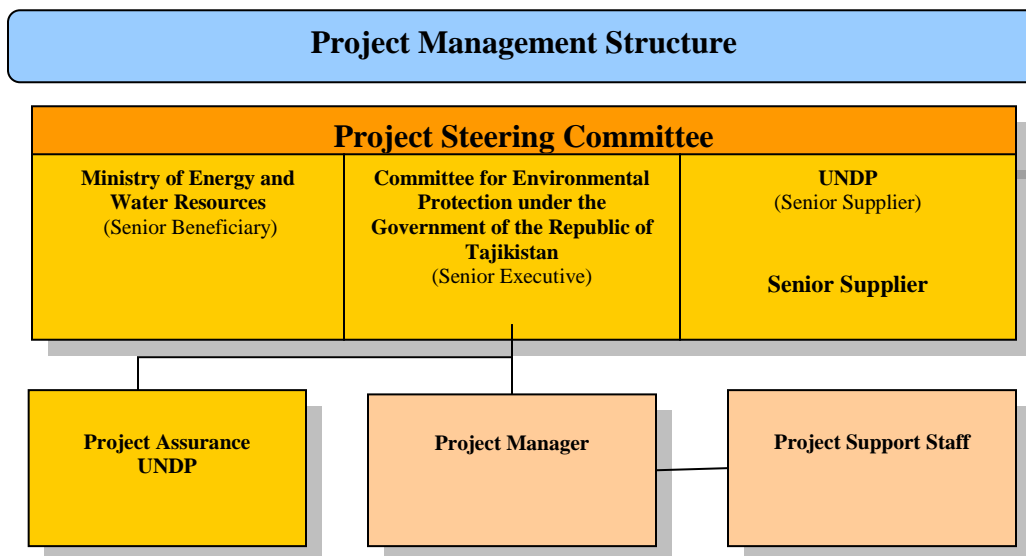
VI. IMPLEMENTATION AND OPERATION

i. General Project Management Structure and Responsibilities

The Committee for Environmental Protection (CEP) under the Government of the Republic of Tajikistan is the government institution responsible for the implementation of the project and will act as the Executing Agency (EA). The Ministry of Agriculture, Ministry of Energy and Water Resources, Agency for Land Reclamation and Irrigation along with other relevant national entities will act as project partners and will become part of Project Steering Committee.

A high-level Project Management structure is shown in Figure 2. The key roles are discussed below.

Figure 6 Project organisation structure



ii. Project Steering Committee

The Project Steering Committee (PSC) will be responsible for the overall implementation of the project. The PSC will include representatives from UNDP in Tajikistan, CEP, as well as from other relevant stakeholders including Ministry of Energy and Water Resources. In addition, the PSC will be responsible for ensuring the effective coordination of this project with other relevant initiatives in Tajikistan.

The Project Steering Committee (PSC) will be convened by CEP and will serve as the project's coordination and decision-making body. The PSC meetings will be chaired by the NPD. It will meet according to necessity, but not less than once in 6 months, to review progress, approve work plans and approve major deliverables.

The PSC is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined. The PSC's role will include: (i) overseeing project implementation; (ii) approving all work plans and budgets, at the proposal of the Project Manager (PM), for submission to Istanbul Regional Hub; (iii) approving any major changes in plans or programmes; (iv) providing technical input and advice; (v) arbitrating any conflicts within the project and/or negotiating solutions between the project and any other stakeholders and (vi) overall evaluation.

The project will also use the existing locally established mechanisms for local consultation and participation. In addition to such mechanisms, consultative committees will be formed, consisting of representatives from local government in the project areas, community representatives, and individuals with technical expertise. The consultative committees will provide technical guidance and feedback to the PSC.

iii. **Project Management Unit and Project Manager**

The Project Management Unit will be established under the Committee for Environmental Protection (CEP) – the project’s Executing Agency. The PMU will include the key roles identified in the organisation chart, in particular the National Project Director (CEP) and Project Manager (UNDP).

The NPD will be a member of CEP, assigned to the project for its period of duration. The NPD’s prime responsibility is to ensure that the project produces the results specified in the project document to the required standard of quality and within the specified constraints of time and cost.

The day-to-day administration will be carried out by a Project Manager (PM), Project Analyst (PA), Admin. Finance Assistant (AFA), and Project Assistant (PA), who will be located at UNDP premises. As per Government requests, the staff will be recruited using standard UNDP recruitment procedures. The PM will, with the support of the AFA and PA, manage the implementation of all activities, including: preparation/updates of work and budget plans, record keeping, accounting and reporting; drafting of terms of reference, technical specifications and other documents as necessary; identification, proposal of consultants, coordination and supervision of consultants and suppliers; organization of duty travel, seminars, public outreach activities and other events; and maintaining working contacts with partners at the central and local levels. The Project Manager will liaise and work closely with all partner institutions to link the project with complementary national programmes and initiatives.

The PM is accountable to UNDP for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Annual Work and Procurement Plans (AWP&PP). The PM will further produce quarterly operational reports and Project Performance Reports (PPR). These reports will summarize the progress made versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring activities. The PM will be technically supported by contracted national and international service providers, based on need as determined by the PM and approved by the PSC, as needed. Recruitment of specialist services will be done by the PM, in accordance with UNDP’s rules and regulations.

The Project Manager is responsible for overseeing implementation of the ESMF and required environmental and social risk management actions as outlined in Table 2 (ESMF) and SES

iv. **Project Assurance**

The ‘project assurance’ function of UNDP is to support the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Project assurance has to be independent of the Project Manager; therefore, the Project Management Unit and/or Project Steering Committee cannot delegate any of its assurance responsibilities to the Project Manager. Furthermore, as the Senior Supplier, UNDP provides quality assurance for the project; ensures adherence to the NIM guidelines and compliance with UNDP policies and procedures, including its Social and Environmental Standards and implementation of the requirements of this ESMF.

A UNDP Programme Officer, or M&E Officer, typically holds the Project Assurance role on behalf of UNDP. UNDP Tajikistan will support project implementation by assisting in monitoring project budgets and expenditures, recruiting and contracting project personnel and consultant services, subcontracting and procuring equipment. UNDP Tajikistan will also monitor the project implementation and achievement of the project outcomes/outputs and ensure the efficient use of donor funds through an assigned UNDP Team Leader. UNDP will act as the Senior Supplier and Project Assurance.

VII.PROJECT DELIVERY AND ADMINISTRATION

i. Project Delivery

The Executive Agency – through the PMU, Project Manager and subsidiary departments and the delivery organisations (e.g. contractors and/or NGOs LIST WHERE KNOWN) – will implement the project. In addition, collaboration with councils, existing NGOs and local communities is expected by UNDP.

As outlined in UNDP's application to the Adaptation Fund Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of execution modalities determined on country demand, the specificities of an intervention, and a country context. Under the national execution modality proposed, UNDP selects a government entity as the Executing Entity based on relevant capacity assessments performed by UNDP. Please note that UNDP uses slightly different terminology to that used by the operational policies and guidelines of the Adaptation Fund. In UNDP terminology, the "executing entity" is referred to as the "Implementing Partner" in countries which have adopted harmonized operational modalities and the "Executing Entity" in countries which have not yet done so. The Executing Entity is the institutional entity entrusted with and fully accountable to UNDP for successfully managing and delivering project outputs. It is responsible to UNDP for activities including: the preparation and implementation of work plans and annual audit plans; preparation and operation of budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and personnel; financial and progress reporting; and monitoring and evaluation. As stated above, however, UNDP retains ultimate accountability for the effective implementation of the project.

As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key general management and specialized technical support services. These services are provided through UNDP's global network of country, regional and headquarters offices and units and include assistance in: project formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of staff and consultants; general oversight and monitoring, including participation in reviews; receipt, allocation and reporting to the donor of financial resources; thematic and technical backstopping; provision of systems, IT infrastructure, branding, and knowledge transfer; research and development; participation in policy negotiations; policy advisory services; programme identification and development; identifying, accessing, combining and sequencing financing; troubleshooting; identification and consolidation of learning; and training and capacity building.

The Committee for Environmental Protection will be responsible for executing this five-year project with the support of the UNDP under UNDP's National Implementation Modality (NIM). At the request of the Government of Tajikistan, UNDP is the Multilateral Implementing Entity (MIE). The project is nationally implemented (NIM), in line with the Standard Basic Assistance Agreement (SBAA, 1993) and the UN Development Assistance Framework (UNDAF) 2016-2020 between the UN and the Government of Tajikistan, as well as Country Programme Document 2016-2020 between UNDP and the Government of Tajikistan.

The CEP will assume responsibility for the implementation, and the timely and verifiable attainment of project objectives and outcomes. It will provide support to the management unit, and inputs for, the

implementation of all activities. The CEP will nominate a high-level official who will serve as the National Project Director (NPD) for project implementation. The NPD will chair the Project Steering Committee and be responsible for providing government oversight and guidance to the implementation. The NPD will not be paid from project funds but will represent a Government in kind contribution.

UNDP has the technical and administrative capacity to support the Committee for Environmental Protection and assume the responsibility for mobilising and effectively applying the required inputs to reach the expected outputs. The financial arrangements and procedures for the project are governed by the UNDP rules and regulations for National Implementation Modality (NIM). All procurement and financial transactions will be governed by applicable UNDP regulations under NIM.

UNDP Direct Project Services as requested by Government: The UNDP, as the Multilateral Implementing Entity for this project, will provide project management cycle services for the project as defined by the Adaptation Fund Board. In addition, the Government of Tajikistan may request UNDP direct services for specific projects, according to its policies and convenience. If requested the services would follow the UNDP policies on the recovery of direct costs. These services (and their costs) are specified in the Letter of Agreement (Annex 8). As is determined by the AF Board requirements, these service costs will be assigned as Project Management Cost, duly identified in the project budget as Direct Project Costs.

ii. Administration of Environmental and Social Management Framework

The Executive Agency CEP will be responsible for overseeing the implementation and compliance with the ESMF via the collaborating delivery organisations (e.g. contractors, NGOs). The ESMF and developed management plans and will be part of any tender documentation.

The CEP will be responsible for the revision or updates of this document and relevant management plans during the course of work. Material changes to the ESMF will be made in consultation with UNDP.

The UNDP and CEP are accountable for the provision of specialist advice on environmental and social issues to the delivery organisations (e.g. contractors, NGOs) and for environmental and social monitoring and reporting. The CEP or its delegate will assess the environmental and social performance of the delivery organisations (e.g. contractors, NGOs) in charge of delivering each component throughout the project and ensure compliance with the ESMF. During operations the delivery organisations will be accountable for implementation of the ESMF. Personnel working on the project have accountability for preventing or minimising environmental and social impacts.

For construction activities, the delivery organisation/site supervisor will be responsible for daily inspections (e.g. environmental inspections, Occupational Health & Safety) of the construction site. The CEP will cross check these inspections by undertaking monthly audits. The Supervising Engineer/Project Manager will supervise the contractor, while the CEP will be responsible for environment and social issues.

The delivery organisations (e.g. contractor, NGO) will be responsible for the day-to-day compliance of the ESMF at the specific project site. The delivery organisations (e.g. contractor, NGO) will maintain and keep all administrative and social and environmental records which would include a log of complaints and incidents together with records of any measures taken to mitigate the cause of the complaints or incidents (see below sections on incident reporting and on complaints).

VIII. STAKEHOLDER ENGAGEMENT

i. Project Stakeholders

A wide range of stakeholders were consulted with during the scoping and validation phase of proposed project development. Importantly, the project’s Executing Entity, the CEP, was consulted through the iterative process of refining the project design. As the national organization responsible for implementing adaptation projects in the country, the CEP is comprised of numerous technical experts. Therefore, the CEP is well-positioned to ensure that the project design is tailored to local requirements, that it benefits vulnerable groups and includes necessary gender considerations.

A Validation Workshop was held in Dushanbe on 22 June 2018 that included representatives from relevant KRB districts, international organizations, academia and partner projects. The primary stakeholders that will be involved in the implementation of the proposed project are detailed in Table 6, while a complete list of all participants present at the workshop is included in Annex 1 of the project proposal.

A complete list of all stakeholders consulted with during the development of the Concept and Full Proposal is included in Table 7.

Table 6. Primary stakeholders to be involved in project implementation.

Stakeholder	Brief description
Committee of Environmental Protection (CEP)	<p>The CEP is the main specialised governmental body responsible for implementation of the state policy on environmental protection in Tajikistan. Responsibilities of the CEP include the following:</p> <ul style="list-style-type: none"> • developing drafts of governmental policies, strategies and action plans for environmental protection as well as implementation; • drafts laws, by-laws and decisions for the protection of the environment; • performs monitoring of the implementation of laws, by-laws, state policies and measures on environmental protection; • oversees the implementation process of all environmental conventions where Tajikistan is a member; • acts as the GEF Focal Point; • acts as the GCF National Designated Authority; and • acts as the Adaptation Fund Focal Point.
National Agency on Hydrometeorology (Hydromet)	<p>The Hydromet is responsible for environment-, climate- and hydro-meteorological-related monitoring. It is the agency responsible to formulate and inform the GoT and local authorities on short-term weather forecasts. The scope of activities of the Hydromet are broad and include:</p> <ul style="list-style-type: none"> • observation and data collection on hydro-, meteorological- and climate-related regimes in Tajikistan; • observation over the extreme weather events and other hydrometeorological disasters in the country; • archiving historic and present data and analyses of the patterns tendencies; and • serving as a National Focal Point under the UNFCCC and provides technical support and policy advice to the CEP for its implementation process; as well as representing the GoT in UNFCCC negotiations.
Ministry of Energy and Water Resources (MEWR)	<p>The MEWR is tasked with the formulation and implementation of national energy- and water-related policies. Particular climate-related activities of the MEWR include:</p> <ul style="list-style-type: none"> • the design, revision and regular update of national strategies for energy and water development; • drafting respective legal documents for the improvement and development of energy and water sector-based projects; • monitoring the implementation of National Development Programs and Action Plans on renewable energy sources; and • participating in the strategic development projects on hydropower plants construction.
University of Central Asia	<p>Contribution of knowledge building and technical know-how related to suggested project’s EbA related interventions.</p>
Open Centre, DoG	<p>Contribution of knowledge building and technical know-how related to suggested project’s EbA related interventions.</p>

A list of the stakeholders consulted to date and those that will be consulted during the development of the full project proposal are listed below.

Table 2. A list of all stakeholders consulted with during development of the proposed project.

Stakeholder	Stakeholder type
Aga Khan Development Foundation	Regional development agency
Agency of Statistics	Government agency
Asian Development Bank	International development agency
ClimAdapt	International organisation
Committee for Emergency and Civil Defence	Government agency
Committee of Environmental Protection (CEP)	Government agency
<i>Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)</i>	International development agency
European Union	International organisation
Food and Agriculture Organisation of the United Nations (FAO)	International development agency
Forestry Agency	Government agency
KFW Development Bank	International development bank
Ministry of Economic Development and Trade (MEDT)	Government agency
Ministry of Energy and Water Resources (MEWR)	Government agency
Ministry of Transport	Government agency
National Agency on Hydrometeorology (Hydromet)	Government agency
Swiss Agency for Development and Cooperation (SDC)	International development agency
UNDP Disaster Risk Management Programme (DRMP)	UNDP programme
United Nations Children's Fund	International development agency
United States Agency for International Development (USAID)	International development agency
University of Central Asia	Regional academic institution
World Bank	International development bank

ii. Stakeholder Engagement Programme

The Stakeholder Engagement Programme seeks to set the procedures for ensuring consultation and stakeholder engagement during assessment, development of action plans, and monitoring of social and environmental impacts associated with specific project activities, including information disclosure requirements.

The UNDP jointly with CEP and the MoEWR will develop and release project-related information to communities, organizations and municipalities where the project is implementing its activities. In order to do so, the project will make use of:

- Newspapers, local radio podcasts, and local television;
- Brochures, leaflets, non-technical summary documents and technical reports.

The project will ensure that women and other relevant groups such as the elderly, and the youth receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and these other groups; therefore, it is expected to enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing their views.

The Stakeholder Engagement Programme will build on various activities and methods, including the promotion of participatory processes, joint decision-making, and partnerships undertaken with local communities, NGOs, and local governments. The project will support the operationalization and formalization of the KRB Platform, which is envisaged as a key multi-stakeholder coordination, consultations and information sharing mechanism involving national and municipal entities, as well as community based- and civil society organisations. The project will also support exchange visits, inter-agency collaboration, and training and capacity building initiatives.

The stakeholder engagement activities will take place in different phases of the project and in specific locations of the KRB. Two major stakeholder engagement activities will be the inception and final workshops where various stakeholders will have the opportunity to participate and be informed about the project outcomes.

The National Project Coordinator is responsible for carrying out the specific stakeholder engagement activities. These activities will be supported by the Project Management Unit (PMU); in case the PMU is not capable of undertaking the activities, technical assistance will be provided. Stakeholder engagement activities and required technical assistances will be funded by the project's budget as part of specific Outputs.

The project team will develop and release updates on the project on a regular basis to provide interested stakeholders with information on project status.

iii. Stakeholder Consultation and Information Disclosure

The project builds on extensive stakeholder engagement and consultations which will continue throughout project implementation, including in the identification, assessment, and development of management measures for forthcoming project activities. The project was discussed with a wide range of stakeholders including relevant government departments, industry groups, NGOs, and individual community members and approved by Government. Extensive on-ground consultation has been undertaken during the design of the project (provide any Reports on Consultations in annexes).

Meaningful, effective and informed stakeholder engagement and participation will continue to be undertaken that will seek to build and maintain over time a constructive relationship with stakeholders, with the purpose of avoiding or mitigating any potential risks in a timely manner. The scale and frequency of the engagement will reflect the nature of the activity, the magnitude of potential risks and adverse impacts, and concerns raised by affected communities.

Stakeholders will have access to relevant project information in order to understand potential project-related opportunities and risks and to engage in project design and implementation. Specifically, the following information will be made available:

- Stakeholder engagement plans and summary reports of stakeholder consultations,
- Social and environmental screening reports (SESP) with project documentation (30 days prior to approval),
- Draft social and environmental assessments, including any draft management plans (30 days prior to finalization),
- Final social and environmental assessments and associated management plans,
- Any required social and environmental monitoring reports.

This information is to be disclosed in a timely manner, in an accessible place, and in a form and language understandable to affected persons and other stakeholders. These elements of effective disclosure are briefly elaborated below:

- Timely disclosure: information on potential project-related social and environmental impacts and mitigation/management measures will be provided in advance of decision-making whenever possible. In all cases, draft and final screenings, assessments and management plans must be disclosed and consulted on prior to implementation of activities that may give rise to potential adverse social and environmental impacts.
- Accessible information: Appropriate means of dissemination will need to be considered in consultation with stakeholders. This could include posting on websites, public meetings, local councils or organizations, newsprint, television and radio reporting, flyers, local displays, direct mail.
- Appropriate form and language: Information needs to be in a form and language that is readily understandable and tailored to the target stakeholder group.

IX. GRIEVANCE REDRESS MECHANISM

During the design, construction and implementation of any project, a person or group of people may perceive or experience potential harm, directly or indirectly due to the project activities. The grievances that may arise can be related to social issues such as eligibility criteria and entitlements, disruption of services, temporary or permanent loss of livelihoods and other social and cultural issues. Grievances may also be related to environmental issues such as excessive dust generation, damages to infrastructure due to construction related vibrations or transportation of raw material, noise, traffic congestions, decrease in quality or quantity of private/ public surface/ ground water resources during irrigation rehabilitation, damage to home gardens and agricultural lands, etc.

Should such a situation arise, there must be a mechanism through which affected parties can resolve such issues in a cordial manner with the project personnel in an efficient, unbiased, transparent, timely and cost-effective manner. To achieve this objective, a Grievance Redress Mechanism has been included in the ESMF for this project.

The Grievance Redress Mechanism is designed to:

- a. be a legitimate process that allows for trust to be built between stakeholder groups and assures stakeholders that their concerns will be assessed in a fair and transparent manner;
- b. allow simple and streamlined access to the Grievance Redress Mechanism for all stakeholders and provide adequate assistance for those that may have faced barriers in the past to be able to raise their concerns;
- c. provide clear and known procedures for each stage of the Grievance Redress Mechanism process, and provides clarity on the types of outcomes available to individuals and groups;
- d. ensure equitable treatment to all concerned and aggrieved individuals and groups through a consistent, formal approach that, is fair, informed and respectful to a concern, complaints and/or grievances;
- e. to provide a transparent approach, by keeping any aggrieved individual/group informed of the progress of their complaint, the information that was used when assessing their complaint and information about the mechanisms that will be used to address it; and
- f. enable continuous learning and improvements to the Grievance Redress Mechanism. Through continued assessment, the learnings may reduce potential complaints and grievances.

The GRM will be gender- and age-inclusive and responsive and address potential access barriers to women, the elderly, the disabled, youth and other potentially marginalized groups as appropriate to the Project. The GRM will not impede access to judicial or administrative remedies as may be relevant or applicable and will be readily accessible to all stakeholders at no cost and without retribution.

Information about the Grievance Redress Mechanism and how to make a complaint and/or grievance must be communicated during the stakeholder engagement process and placed at prominent places for the information of the key stakeholders.

All complaints and/or grievances regarding social and environmental issues can be received either orally (to the field staff), by phone, in complaints box or in writing to the UNDP, WHO or the Contractor. A key part of the grievance redress mechanism is the requirement for the WHO/PMU and construction contractor to maintain a register of

complaints and/or grievances received at the respective project site offices. The following information will be recorded:

- a. time, date and nature of enquiry, concern, complaints and/or grievances;
- b. type of communication (e.g. telephone, letter, personal contact);
- c. name, contact address and contact number;
- d. response and review undertaken as a result of the enquiry, concern, complaints and/or grievances; and
- e. actions taken and name of the person taking action.

i. UNDP SRM and SECU

In addition to the project-level and national grievance redress mechanisms, complainants have the option to access UNDP's Accountability Mechanism, with both compliance and grievance functions. The Social and Environmental Compliance Unit investigates allegations that UNDP's Standards, screening procedure or other UNDP social and environmental commitments are not being implemented adequately, and that harm may result to people or the environment. The Social and Environmental Compliance Unit is housed in the Office of Audit and Investigations, and managed by a Lead Compliance Officer. A compliance review is available to any community or individual with concerns about the impacts of a UNDP programme or project. The Social and Environmental Compliance Unit is mandated to independently and impartially investigate valid requests from locally impacted people, and to report its findings and recommendations publicly.

The Stakeholder Response Mechanism offers locally affected people an opportunity to work with other stakeholders to resolve concerns, complaints and/or grievances about the social and environmental impacts of a UNDP project. Stakeholder Response Mechanism is intended to supplement the proactive stakeholder engagement that is required of UNDP and its Implementing Partners throughout the project cycle. Communities and individuals may request a Stakeholder Response Mechanism process when they have used standard channels for project management and quality assurance, and are not satisfied with the response (in this case the project level grievance redress mechanism). When a valid Stakeholder Response Mechanism request is submitted, UNDP focal points at country, regional and headquarters levels will work with concerned stakeholders and Implementing Partners to address and resolve the concerns. Visit www.undp.org/secu-srm for more details. The relevant form is attached at the end of the ESMF.

X. MONITORING & EVALUATION OF ESMF IMPLEMENTATION

Table below provides a summary of specific measures related to implementation of the ESMF requirements.

Table 6. Summary of ESMF Implementation Activities

Monitoring activity	Purpose	Frequency	Expected action	Roles and responsibilities
Development of Environmental and Social Impact Assessment (ESIA)	Carried out and drafted in a participatory and gender responsive manner, in-depth analysis of potential social and environmental impacts, as well as identification / validation of mitigation measures linked to projects activities.	Quarters one and two of programme implementation	Risks and potential impacts are assessed according the site of implementation and the modality, with support of external consultants and participation of project team and stakeholders; management actions are identified and incorporated into project implementation strategies.	CEP with the support of UNDP will launch the ESIA process. A group of consultants will lead the process and garner the expertise needed. Stakeholders will review the terms of reference, and validate the findings. The Consultants and the team will ensure that relevant changes and updates are made to the ESMF and again validated by stakeholders.
Track progress of ESMF implementation	Application of mitigation measures, as well as any required changes to ESMF, including site-specific plans as required by applicable SES, will be monitored through a participatory process, and with results reported to Project Board on bi-annual basis until ESMP (or stand-alone management plans) is in place.	Quarterly, or in the frequency required for each measure.	Slower than expected progress will be addressed by project management.	Collection of data will be ascribed to various stakeholder groups and the PMU. The project management unit, and particularly the safeguards and gender officer, will integrate the mitigation measures into the overall monitoring and reporting framework of the project.
Implementation of mitigation measures and monitoring of potential impacts identified in ESIA,	Permanent and participatory implementation and monitoring of impacts and mitigation measures, in accordance with Environmental and Social Management Plan - ESMF (to be revised and updated once the ESIA is completed)	Continuous	Implementation of ESMF; participatory monitoring of ESIA findings (i.e. identifying and aligning indicators, monitoring potential impacts and risks); integration of ESMF into project implementation strategies	The PMU will be responsible for the implementation of the mitigation measures in conjunction with stakeholders in various parts of the project.
Learning	Knowledge, good practices and lessons learned regarding social and environmental risk management will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project.	At least annually	Relevant lessons are captured by the project team and used to inform management decisions.	PMU, PSC, CEP, MoEWR
Bi-Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project.	Bi-Annually	Areas of strength and weakness will be reviewed by project management and used to inform decisions to improve project performance.	PMU, PSC

Review and adapt activities and approach as necessary	Internal review of data and evidence from all monitoring actions to inform decision making.	At least annually	Performance data, risks, lessons and quality will be discussed by the project board and used to make course corrections.	PMU
Project Report	As part of progress report to be presented to the Project Board and key stakeholders, analysis, updating and recommendations for risk management will be included.	Annually, and at the end of the project (final report)		PSC
Project Review (PSC)	The project's governance mechanism (i.e., project board) will hold regular project reviews during which an updated analysis of risks and recommended risk mitigation measures will be discussed.	At least annually	Any risks and/ or impacts that are not adequately addressed by national mechanisms or project team will be discussed in project board. Recommendations will be made.	PSC

XI. BUDGET FOR ESMF IMPLEMENTATION

A budget has been prepared for the implementation of the ESMF as follows:

Activity / Item	Cost
ESMF Updating and Auditing	\$10,000
General ESMF Expenses	\$20,000
Consultants for ESIA/targeted assessments and development of identified management plans	\$50,000
Stakeholder Engagement Workshops	\$140,000
Project-level Grievance Redress Mechanism	\$50,000
Total	\$900,000

Appendix I

Guidance for Submitting a Request to the Social and Environmental Compliance Unit (SECU) and/or the Stakeholder Response Mechanism (SRM)

Purpose of this form

- **If you use this form, please put your answers in bold writing to distinguish text**
- **The use of this form is recommended, but not required. It can also serve as a guide when drafting a request.**

This form is intended to assist in:

- (1) Submitting a request when you believe UNDP is not complying with its social or environmental policies or commitments and you are believed you are being harmed as a result. This request could initiate a ‘compliance review’, which is an independent investigation conducted by the Social and Environmental Compliance Unit (SECU), within UNDP’s Office of Audit and Investigations, to determine if UNDP policies or commitments have been violated and to identify measures to address these violations. SECU would interact with you during the compliance review to determine the facts of the situation. You would be kept informed about the results of the compliance review.

and/or

- (2) Submitting a request for UNDP “Stakeholder Response” when you believe a UNDP project is having or may have an adverse social or environmental impact on you and you would like to initiate a process that brings together affected communities and other stakeholders (e.g., government representatives, UNDP, etc.) to jointly address your concerns. This Stakeholder Response process would be led by the UNDP Country Office or facilitated through UNDP headquarters. UNDP staff would communicate and interact with you as part of the response, both for fact-finding and for developing solutions. Other project stakeholders may also be involved if needed.

Please note that if you have not already made an effort to resolve your concern by communicating directly with the government representatives and UNDP staff responsible for this project, you should do so before making a request to UNDP’s Stakeholder Response Mechanism.

Confidentiality: If you choose the Compliance Review process, you may keep your identity confidential (known only to the Compliance Review team). If you choose the Stakeholder Response Mechanism, you can choose to keep your identity confidential during the initial eligibility screening and assessment of your case. If your request is eligible and the assessment indicates that a response is appropriate, UNDP staff will discuss the proposed response with you, and will also discuss whether and how to maintain confidentiality of your identity.

Guidance: When submitting a request please provide as much information as possible. If you accidentally email an incomplete form, or have additional information you would like to provide, simply send a follow-up email explaining any changes.

Information about You

Are you...

1. A person affected by a UNDP-supported project?

Mark “X” next to the answer that applies to you:

Yes:

No:

2. An authorized representative of an affected person or group?

Mark “X” next to the answer that applies to you:

Yes:

No:

If you are an authorized representative, please provide the names of all the people whom you are representing, and documentation of their authorization for you to act on their behalf, by attaching one or more files to this form.

3. First name:
4. Last name:
5. Any other identifying information:
6. Mailing address:
7. Email address:
8. Telephone Number (with country code):
9. Your address/location:
10. Nearest city or town:
11. Any additional instructions on how to contact you:
12. Country:

What you are seeking from UNDP: Compliance Review and/or Stakeholder Response

You have four options:

- Submit a request for a Compliance Review;
- Submit a request for a Stakeholder Response;
- Submit a request for both a Compliance Review and a Stakeholder Response;
- State that you are unsure whether you would like Compliance Review or Stakeholder Response and that you desire both entities to review your case.

13. Are you concerned that UNDP's failure to meet a UNDP social and/or environmental policy or commitment is harming, or could harm, you or your community? Mark "X" next to the answer that applies to you:
Yes: No:

14. Would you like your name(s) to remain confidential throughout the Compliance Review process?

Mark "X" next to the answer that applies to you: Yes: No:

If confidentiality is requested, please state why:

15. Would you like to work with other stakeholders, e.g., the government, UNDP, etc. to jointly resolve a concern about social or environmental impacts or risks you believe you are experiencing because of a UNDP project?

Mark "X" next to the answer that applies to you: Yes: No:

16. Would you like your name(s) to remain confidential during the initial assessment of your request for a response?

Mark "X" next to the answer that applies to you: Yes: No:

If confidentiality is requested, please state why:

17. Requests for Stakeholder Response will be handled through UNDP Country Offices unless you indicate that you would like your request to be handled through UNDP Headquarters. Would you like UNDP Headquarters to handle your request?

Mark "X" next to the answer that applies to you: Yes: No:

If you have indicated yes, please indicate why your request should be handled through UNDP Headquarters:

18. Are you seeking both Compliance Review and Stakeholder Response?

Mark "X" next to the answer that applies to you: Yes: No:

19. Are you unsure whether you would like to request a Compliance Review or a Stakeholder Response? Mark "X" next to the answer that applies to you: Yes: No:

Information about the UNDP Project you are concerned about, and the nature of your concern:

20. Which UNDP-supported project are you concerned about? (if known):

21. Project name (if known):

22. Please provide a short description of your concerns about the project. If you have concerns about UNDP's failure to comply with its social or environmental policies and commitments, and can identify these policies and commitments, please do (not required). Please describe, as well, the types of environmental and social

impacts that may occur, or have occurred, as a result. If more space is required, please attach any documents. You may write in any language you choose

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23. Have you discussed your concerns with the government representatives and UNDP staff responsible for this project? Non-governmental organisations?

Mark "X" next to the answer that applies to you: Yes: No:

If you answered yes, please provide the name(s) of those you have discussed your concerns with

Name of Officials You have Already Contacted Regarding this Issue:

First Name	Last Name	Title/Affiliation	Estimated Date of Contact	Response from the Individual

24. Are there other individuals or groups that are adversely affected by the project?

Mark "X" next to the answer that applies to you: Yes: No:

25. Please provide the names and/or description of other individuals or groups that support the request:

First Name	Last Name	Title/Affiliation	Contact Information

Please attach to your email any documents you wish to send to SECU and/or the SRM. If all of your attachments do not fit in one email, please feel free to send multiple emails.

Submission and Support

To submit your request, or if you need assistance please email: project.concerns@undp.org

Appendix 2

GENDER CONSIDERATIONS

In the 2014 edition of the Social Institutions and Gender Index (SIGI), Tajikistan reportedly has medium levels of discrimination against women in social institutions (SIGI score of 0.1393). It has lower discrimination in restricted access to resources and assets and higher discrimination in son bias.

During the project preparation phase, the following key gender issues were identified:

- a. In 2012, the ratio of female to male primary education enrolment was 98%. In 2011, the ratio of female to male secondary school enrolment was 88% and 97 for primary education. The male/female sex ratio for the working age population in 2013 is 0.98. Rigid notions of men's and women's roles in society and in the home remain. It is believed that men should occupy the role of breadwinner and head of the household, while women should confine themselves to domestic and care work within the home.
- b. Under the Land Code, women and men have equal rights to access and manage land. According to the World Bank (2011), 78% of female-headed households (where there is no working-age male) manage land, compared to 89% of male-headed households, and 91% of female-headed households with at least one working age male.
- c. The Tajik Civil Code gives women the right to have access to property other than land and to enter into contracts in their own names. In practice, property is routinely registered in the name of husbands or male relatives, as property ownership is seen as a male prerogative. In addition, most married couples live in property belonging to the husband's parents, meaning that the wife often has no legal claim on the property at all. Many women are still unaware of their rights and the opportunities available to them as a result of the land reform processes that began in the 1990s. Even when they do know their rights, registering a farm is a complex administrative process. When women are allocated land in their own right, it is often of poor quality for farming, and they are often denied access to land belonging to their husbands in the event of divorce or widowhood. In addition, requirements in the Land Code that land only be allocated to those who are qualified to manage it discriminate against women, given that few have formal agricultural qualifications, and local officials tend to view them as incapable of running a farm. Women lack education, access to productive resources, and technical training that would enable them to increase productivity above subsistence levels, and increase wealth.
- d. Under the Family Code and the Civil Code, within registered marriages, spouses have equal property rights, but this does not apply to unregistered, religious marriages, leaving many women unable to claim their property rights when the relationship breaks down.
- e. Women and men have the same rights to access bank loans and credit. Few women apply for loans, however, primarily because they do not understand their rights and the procedures involved. The fact that most property is registered to men rather than women makes it difficult for women to secure credit, as they cannot provide collateral for loans. High bank charges and rates of interest also hamper women's access to credit. As of 2012, women made up 32.91% of recipients of micro-credit in Tajikistan, according to the Microfinance Information Exchange.

The project activities have been designed to address some of these gender-related issues, as follows:

- f. The project will facilitate the employment, training and equipping of woman as community liaison officers, leskhoz forest enforcement staff, local environmental enforcement staff.

- g. The project will actively encourage the equitable use of women labour and supervisors from local rural villages in: the planning and implementation of pasture management plans; the planning and restoration of degraded high altitude pastures; and the planning and rehabilitation/restoration of high altitude forests.
- h. The project will ensure that women-owned and/or managed businesses participate equitably in the procurement of project-funded materials, supplies, equipment and infrastructure. In some instances, the project may adopt a preferential procurement approach to the provision of minor services and supplies from local women-owned businesses.
- i. The project will ensure that the reach of project-funded education/awareness-raising programmes, sustainable livelihood development support, and skills training will include both male- and female-headed households from the targeted villages.
- j. The project will ensure that the interests of women and women-headed households are adequately represented on River Basin Development Plans, Pasture User Unions and Participatory Forest Management Committees; and are actively involved in the planning of protected areas, pastures and forests and generally in planning of all EbA related interventions in the project implementation planning domain.
- k. The project will ensure that the reach of project-funded support include both male- and female-headed households from the targeted villages.
- l. The project will actively assist women-headed households living in the high altitude areas to access: (i) small sub-project support for sustainable livelihoods; and (ii) technical and financial support from project grants for developing and installing alternative fuel and energy systems, income generating business opportunities, and implementing more sustainable pasture management practices.
- m. The project will commit dedicated financial and technical support to addressing the significant knowledge constraints in pasture users from women-headed households.
- n. The project will ensure that the River Basin Management Plan includes strategies, activities and budgets that will enable and finance the equitable involvement of women in the implementation of the plan.
- o. The project will advocate for an increase in the number of women involved in research and monitoring of pastures, forests, conservation areas, where EbA related activities are being carried out.
- p. The project will collaborate with the project-contracted businesses and international experts to continually develop and implement mechanisms which may further strengthen the capacities of local women and women-headed households across the project planning domain.
- q. Incorporate specific awareness activities for women and vulnerable groups (children, elderly, disabled) into all communication activities to reduce disproportional vulnerabilities and ensure inclusivity of the measures.

The project will promote women's equality and empowerment, including participation in project decision-making. The project will ensure that women receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and therefore enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing women's views.

For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated in relevant project reports (Inception Report) as well as updated within ESMF and SES. Furthermore, when possible, measures and techniques that can have a positive impact by closing the gap of inequality between men and women will be promoted.

Given the relatively higher rates of labor migration among men (to Russian Federation and else), households without manpower, i.e. female-headed households, may also be considered vulnerable. Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project design and implementation.

Marginalized groups in project area of Kofirnighan river basin can be considered poor and vulnerable population that potentially include those living in places with increased impacts of climate change, food insecure households, households with limited or no productive assets (limited resilience), livestock and/or agricultural land plots.

Prior to project implementation, during inception phase, the project will carry out a comprehensive vulnerability assessment of target communities in participatory manner holding focused consultations in designing specific tailor-made activities suitable for vulnerable and marginalized groups. Where feasible such groups will be prioritized for concrete adaptation interventions.

The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women's committees, intervention related initiative groups, pasture development associations, Water User Associations (WUA), forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized within such groups and associations.

Among targeted actions that may be prioritized and suitable for vulnerable groups may include on-farm adaptation interventions, household plots productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) may also be suitable for the given groups to ensure benefits are distributed inclusively and in equitable manner.

During the Inception Phase of the Project, when relevant sub-projects will be short-listed and prioritized for concrete communities, a more detailed Gender Analysis will be carried out along with development of Gender Action Plan that will cover identified target communities.

Annex 5. HYDROMET LIST OF NEEDS FOR THE REPAIR AND REHABILITATION OF WEATHER STATIONS

Hydrological stations presented for restoration:

- Kofirnighan River – Tartki;
- Kofirnighan River – Chinar; and
- Sardai-miyona River – Romit.

Hydrometric crossing

Hydrometric crossing (SEBA) is designed for the implementation of hydrometric operations on rivers up to 250 meters wide and flow velocity up to 5.0 m/s. The hydrometric crossing should provide a measurement of the flow velocity, depth and width of the flow and the sampling of water turbidity with remote control from the shore.

The minimum requirements for the hydrometric crossing are as follows:

- strain of the supporting and towing cables with the help of tightening screw couplings; and
- a maximum load of 150 kg.

The minimum requirements for hydrometric crossing are as follows:

- cable system;
- carriages for roller;
- roller block;
- observation booths;
- electric double-drum winch; and
- ancillary equipment.

Cable system

The rope system should include at minimum the following:

- supporting cable with a diameter of 20-24 mm;
- towing cable for horizontal movement of carriage rollers with a diameter of 6 mm (at least);
- suspension cable with a conductive wire for vertical displacement of a gauging load with a diameter of at least 3.25 mm; and
- a set of coastal support.

Roller carriage

The roller carriage is designed to move the gauging weight along the Carrier Cable #3. It is a solid construction with rubberised rollers and ball bearings.

Roller block

The roller block is designed for operation of a tow rope with a cable voltage of 21/2 – to prevent the cable from slipping.

Observer cabin

The observer's cabin must meet the following minimum requirements.

- Material: steel 4–5 mm.
- Dimensions: width – not less than 180 cm; length – not less than 300 cm; height – not less than 230 mm.
- Double-leaf metal door with lock.
- Holes for wiring of the tow rope and the hanging rope.

The Electric double-drum winch and the Control Panel should be located in the Observer's Cabin.

Electric double-drum winch

The electric double-drum winch is designed for horizontal and vertical movement of the gauging weight and must meet the following requirements.

- Electric motor: 3-step motor (1.5 kW, 380 V, 3 different speeds – 13.26 and 53 cm/s) or adjustable motor (1.5 kW, 220 V AC, adjustable speed from 0 to about 50 cm/sec; it is possible to work with a generator).
- Ability to work with a safe handle in the absence of electricity.
- Equipment electric clutch switch for switching the direction of work from horizontal to vertical (lifting and lowering).
- Block of horizontal and vertical displacement counters, which includes a combined (automatic/mechanical) meter for measuring distance (river width) with 5 digits and a counter for measuring the depth with 4 digits.
- Indicator of the drift angle of the suspended turntable.
- Work side: right.
- Maximum loading: 100 kg.

Remote Control

On the Control Panel, all controls, alarms, an electric pulse counter and a stopwatch must be placed.

The control panel should, at a minimum, include the following.

- 1 (one) measuring unit must meet the following requirements:
 - range of measured revolutions: 1–3000;
 - measurement interval: 60–300 s;
 - range of calculation of the water flow rate: 0.01–5 m/s;
 - degree of protection IP40; and
 - electrical supply.
- 1 (one) surface and bottom contact adapter must meet the following minimum requirements:
 - indication of the operation of the Flowmeter (p.);
 - indication of the operation of the bottom contact of the Flowmeter;
 - indication of the operation of the surface contact of the Flowmeter;
 - toggle switch for surface contact of the Flowmeter;
 - terminals for connection of the Measuring unit;
 - terminals for connecting the signal conductors of a rope with a conductive wire;
 - stopwatch;
 - electrical supply.
- 1 (one) table for recording observations in size: width and length – not less than 50 cm; height – not more than 75 cm.

Specific technical characteristics of the Control Panel should be offered by the Contractor depending on its technical solution.

Auxiliary equipment

The auxiliary equipment kit should include:
hydrometric load (SEBA) 50/75 100 kg; and
flow velocity meter (SEBA).

Annex 6. SOCIAL AND ENVIRONMENTAL SCREENING

The completed template, which constitutes the Social and Environmental Screening Report, must be included as an annex to the Project Document. Please refer to the [Social and Environmental Screening Procedure](#) and [Toolkit](#) for guidance on how to answer the 6 questions.

Project Information

Project Information	
1. Project Title	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan
2. Project Number	PIMS 6219
3. Location (Global/Region/Country)	Tajikistan

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?

Briefly describe in the space below how the Project mainstreams the human-rights based approach

In terms of human rights mainstreaming the impact is multidimensional in nature that address right to food, energy, water, health and etc. In particular, the project's interventions have the following social and economic benefits for target population: (a) increased profit margins and farm income, (b) reduced loss of crops and land caused by slope instability, drought or dry spells and also caused by ineffective agricultural practices and livestock grazing/breeding; (c) reduced agricultural inputs, water consumption and thus production costs; (d) reduced risk of economic failure due to diversification of production on and off-farm; (e) reduced crops susceptibility to pests; (f) increased nutrition and food security for local communities; (g) increased provision of fuelwood and timber and reduced loss of trees to drought or dry spells; and (h) increased pasture productivity, fodder production and carrying capacity. In addition, the project interventions increase nonmaterial benefits such as ecosystem services such as tourism and recreation, derived from increased conservation value of landscape.

Throughout the project implementation period, the project will seek to ensure that benefits of the project are shared broadly in a non-discriminatory and equitable manner. As designed, the project will ensure that all relevant stakeholders participate in decision making processes and consultations, and that such participatory processes are transparent. Necessary strategies, action plans, site selection criteria, lessons learned will be documented and shared regularly through community driven consultation platforms that the project will seek to facilitate.

A wide range of stakeholders were consulted with during the scoping and validation phase of proposed project development. Importantly, the project's Executing Entity, the Committee for Environmental Protection (CEP), was consulted through the iterative process of refining the project design. As the national organisation responsible for implementing adaptation projects in the country, the CEP is comprised of numerous technical experts. Therefore, the CEP is well-positioned to ensure that the project design is tailored to local requirements, that it benefits vulnerable groups and includes necessary gender considerations. A Validation Workshop was held in Dushanbe on 22 June 2018 that included representatives from relevant Kafernigan river basin districts, international organisations, academia and partner projects. A list of stakeholders, validation workshop participants, stakeholders consulted with during the development of the concept and full proposal are included in the project document.

In addition, the Environmental and Social Management Framework (ESMF) has been developed to support the project, and that sets out the principles, rules, roles, guidelines and procedures for screening, assessing, and managing the potential social and environmental impacts of the forthcoming but yet undefined interventions (in terms of concrete communities and components). It contains measures and plans to avoid, and where avoidance is not possible, to reduce, mitigate and/or offset adverse risks and impacts. During project implementation phase, the project will mobilize local authorities, active community members, and civil society organizations during the selection processes and short-listing of sub-projects in concrete communities and ensure impartiality of decision making processes that ensure due achievement of project objectives in the Kafernigan river basin. Moreover, during the design, construction and implementation of any sub-projects, a person or a group of people may perceive or experience potential harm, directly or indirectly due to the project activities, and to address such situation, a Grievance Redress Mechanism has been included in the ESMF for this project through which affected parties can resolve issues in a cordial manner with the project personnel in an efficient, unbiased, transparent, timely and cost-effective manner.

Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment

Tajikistan has a relatively high Gender Inequality index rating (0.36) with women’s labor force participation rate of 58.9 percent, compared to men at 77.1 percent. Despite the nearly equal population ratio of man and women in rural Tajikistan, the relatively higher rates of labor migration among men, leaves rural women typically with triple work burden: employment for income, household and care responsibilities, and growing food for consumptions. Thus the project will ensure that women are active members of community organizations and sub-project stakeholder participation groups members taking part in the decision making processes to ensure that benefits are distributed equitably and fairly among men and women in target zones. Defined sub-projects will implemented so that all genders are: i) able to participate fully and equitably; ii) receive comparable social and economic benefits; and iii) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy. A more detailed gender analysis will be carried out during the Inception Phase of project implementation, and a Gender Action Plan then prepared and implemented to ensure this. This gender analysis will also identify local-level gender dynamics to ensure that involvement in the project does not adversely affect the labour burden of women and men. The project anticipates that at least 50% of beneficiaries will be women. The stakeholder participation mechanisms for sub-project formulation and implementation will include provisions to ensure that women are able to represent their interests effectively, and the social impact indicators and corresponding targets of the project will be gender-sensitive, ensuring that women receive an equitable share of benefits and that their status and interests are not marginalized.

Briefly describe in the space below how the Project mainstreams environmental sustainability

Environmental sustainability is a core aspect of the project’s approach. The use of EbA as the main approach to climate risk reduction will ensure that that project activities will result in net positive environmental benefits. Specifically, the project approach will use EbA interventions to strengthen the provision of ecosystem goods and services in rural Tajik watersheds to promote resilience to climate change. On-the-ground interventions will achieve environmental sustainability by: i) rehabilitating ecosystems that provide adaptation benefits to rural communities; ii) reducing rural communities’ reliance on unsustainable natural resource extraction by providing alternative livelihoods; and iii) improving the resource efficiency of rural communities’ livelihoods.

It is expected that project activities will result in: i) an increase in local biodiversity; ii) improved surface water quality; iii) reduced negative hydrological impacts; and iv) a reduction in soil loss through erosion. Few potential environmental risks have been associated with the proposed project activities and these risks are easily mitigated. Risks and mitigation measures are detailed in Part B of this document.

Part B. Identifying and Managing Social and Environmental Risks

<p>QUESTION 2: What are the Potential Social and Environmental Risks? <i>Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any “Yes” responses). If no risks have been identified in Attachment 1 then note “No Risks Identified” and skip to Question 4 and Select “Low Risk”. Questions 5 and 6 not required for Low Risk Projects.</i></p>	<p>QUESTION 3: What is the level of significance of the potential social and environmental risks? <i>Note: Respond to Questions 4 and 5 below before proceeding to Question 6</i></p>			<p>QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?</p>
<p>Risk Description</p>	<p>Impact and Probability (1-5)</p>	<p>Significance (Low, Moderate, High)</p>	<p>Comments</p>	<p>Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.</p>
<p>Risk 1: Principle 1 (Q3): There is a risk that project activities could potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups.</p>	<p>I: 3 P: 3</p>	<p>Moderate</p>	<p>Changes in pasture and livestock management practices and reforestation measures (grazing control, rotational grazing, livestock exclusion zones and reforestation) may limit</p>	<p>Tajikistan’s livestock population continues to increase annually and poses a great stress on degrading pastureland resources with very limited fodder production available nationally and at district levels. Communities have reported that current areas of pasturelands are not sufficient to support the current livestock populations. In addition, reforestation measures supported by the</p>

			<p>availability/accessibility to some basic services.</p>	<p>project will limit access to forest resources for local communities. To alleviate such a limitation, the project will target degraded forests and pasturelands, and once rotational grazing is put in place and target deforested lands are planted with fast-growing woodlots, the communities will soon begin to benefit more already during the project period, the benefits they would not have been otherwise able to have from degraded assets at the time.</p> <p>Specifically, the project will support grazing control measures (rotational grazing), establish livestock exclusion zones and reforestation measures sites in consultation with target benefiting communities. Cost-effectiveness analysis with mid- to long-term impacts will be carried out to inform communities of anticipated benefits, but to address short-term limitations concerning access to pasture lands and forests, the project will promote alternative business solutions and community enterprise developments that will help communities generate compensating incomes. To further support sustainability of given measures, the project will address the need to reduce extensive livestock grazing through enhanced fodder production techniques (within exclusion zones, rotational grazing, on-site production, demonstration plots, etc), productive on-site animal husbandry, and establishment of watering sites at mid-stream levels of catchment/watershed areas (saving livestock energy in search of water sources in the upstream).</p> <p>The project will engage widely with relevant stakeholders at regional, sub-regional and community levels to agree on rotational routes for transit of larger herds, and eliminate potential compromising of implemented grazing control measures applied locally by large herd owners from other communities, districts and/or regions. Jamoat level monitoring and control mechanisms will be introduced to enforce agreed measures for elimination of land degradation and improving vegetation growth in target pasture lands, and ensure that target communities effectively benefit from project interventions.</p> <p>The project will also introduce energy-efficient stoves into target communities to compensate for limited access to forest resources. While such experience already exists in other regions of Tajikistan applied by partner development agencies/projects, the outcomes vary across projects with different degree of efficiency needs. The project will assess the best practices and lessons learned and apply enhanced techniques in Kafernigan river basin.</p> <p>The project will also support the implementation long-term financing of integrated catchment management strategy through PES models that will be developed for each target district. These models will further enable the financing to undertake initiatives that strengthen ecosystem services and build climate resilience with each target district and community. The PES models will be designed based on a combination of regional, international and local best practices. The design will also be informed by the results of existing PES models made use of in Tajikistan. Such models will be accessed through the knowledge hubs that proposed project is supporting (under Outcome 3).</p>
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<p>Risk 2: Principle 1 (Q4): Potentially affected stakeholders, in particular marginalized groups, could potentially be excluded from fully participating in decisions that may affect them.</p>	<p>I: 2 P: 2</p>	<p>Moderate</p>	<p>Limitations may exist in the capacities of local stakeholders, in particular poor and vulnerable groups, to participate effectively in decision making that can affect them.</p> <p>Marginalized groups in project area of Kafernigan river basin can be considered poor and vulnerable population that potentially include those living in places with increased impacts of climate change, food insecure households, households with limited or no productive assets (limited resilience), livestock and/or agricultural land plots. Given the relatively higher rates of labor migration among men (to Russian Federation and else), households without manpower, female-headed households, and those with small children and elderly may also be considered vulnerable. Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project design and implementation.</p>	<p>Prior to project implementation, during inception phase, the project will carry out vulnerability assessment of target communities in participatory manner holding focused consultations in designing specific tailor-made activities suitable for vulnerable and marginalized groups. Where feasible such groups will be prioritized for concrete adaptation interventions. The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women's committees, intervention related initiative groups, pasture development associations, water users associations, forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized within such groups and associations.</p> <p>Among targeted actions that may be prioritized and suitable for vulnerable groups may include on-farm adaptation interventions, household plots productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) may also be suitable for the given groups to ensure benefits are distributed inclusively and in equitable manner.</p>
<p>Risk 3: Principle 1 (Q5): Duty-bearing ministries/agencies and local authorities do not have sufficient expertise and technical/material resources to meet their obligations in the Project.</p>	<p>I: 3 P: 5</p>	<p>Moderate</p>	<p>Capacities of national institutions, district authorities and governance mechanisms are not sufficient to provide effective (governance) solutions to climate problems that are complex and multi-sectoral.</p> <p>There is a risk that duty-bearing organizations will tend to focus more on mitigation response on consequences of adverse climatic and environmental hazards, rather than on prevention through EbA actions.</p>	<p>The project design includes a dedicated component (Component 3) with an extensive set of capacity building actions and knowledge building and sharing at national, regional, local and community levels, based on analysis of institutional framework and related capacities carried out during the project preparation. At national level, focal institutions will be strengthened through participatory development of integrated catchment management strategy and Watershed Action Plans for the Kafernigan river basin. Coordination and training mechanisms will be strengthened within target Jamoats (sub-district government level), which includes capacity building on mainstreaming integrated catchment management (with EbA integrated) into planning and budgetary processes. Trainings target relevant government institutions involved in catchment/watershed management, including CEP and Ministry of Energy and Water Resources.</p> <p>In the framework of implementing the water sector reform programme and development of Kafernigan River Basin Plan under the leadership of the Ministry of Energy and Water Resources, the project will contribute in the river basin development and planning processes through integrating catchment management strategies and watershed action plans with EbA related interventions as necessary.</p>
<p>Risk 4: Principle 2 (Q2): Women may be excluded from decision-making or not adequately participate in the design/implementation of the project. As a result, they might have unequal access to resources and/ or access to opportunities and benefits.</p>	<p>I: 2 P: 3</p>	<p>Moderate</p>	<p>Due to high level of male labor outmigration from rural communities, women are overburdened with household management and maintenance of nearby land assets. This may potentially limit women's participation in project consultation and planning processes, but if</p>	<p>Designed project activities will be implemented so that all genders are: (a) able to participate fully and equitably, (b) receive comparable social and economic benefits, (c) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy.</p> <p>A more detailed gender analysis will be undertaken in the inception phase of the project to assess divisions of labor and women's role and access to resources and to develop recommendations on how project will promote women's equality and empowerment, including participation in project decision-making, as</p>

			necessary measures are taken, the increased role of women in agriculture and livestock management at household level may result advantageous to women in the first place.	outlined in the ESMF. For this purpose, based on a detailed gender analysis, and in consultation with target communities that have prioritized their sub-projects, a comprehensive Gender Action Plan will be developed that will state out requirements to ensure that SES are met. The requirements and measures will ensure that women receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and therefore enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing women's views. For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated. Furthermore, when possible, measures and techniques that can have a positive impact by closing the gap of inequality between men and women will be promoted.
Risk 5: Standard 1 (Q1.5): With reforestation, rehabilitation, and restoration of abandoned and overexploited forests and degraded forest ecosystems, there is a risk of potential use of alien and invasive alien species	I: 2 P: 1	Moderate	Forest restoration will involve planting of more resilient tree species, using native varieties. From Proposal p101: The project's activities will promote the rehabilitation/restoration of abandoned and overexploited forests and degraded forest ecosystems, as well as reforestation of areas adversely affected by extreme climate events. The use of native and climate-resilient varieties will be promoted, but alien species may be introduced if necessary. Certain alien species may be used for complementary planting (climate-resilient crops seed varieties) in areas being reforested to increase biological biodiversity and enhance climate resilience. Prior to such introduction, relevant experts at the Committee for Environmental Protection (CEP) and among development partner agencies will be consulted on successful examples across the regions. National environmental norms, standards and procedures for the introduction of alien species will be followed in each case.	Prior to introduction of alien species, the project will consult relevant experts at CEP, among development partner agencies, dehqan and corporate farms on successful examples across the regions. Necessary national environmental standards, norms and procedures of adaptation of intended alien species will be followed and assessed before introduction takes place. While restoration needs are many in each target district within Kafernigan river basin, the project will consult municipalities and communities to define restoration areas with particular focus on priority areas most vulnerable to water related adverse climatic events. The Project will also support the setting up of a procedure for tracking, monitoring and registration of restoration actions implemented. During the last year of the project an ecological and land use assessment will be carried out to evaluate the rate of success of the restoration.
Risk 6: Standard 1 (Q1.6): The Project involves reforestation of degraded forest areas in which some community harvesting of forest resources occurs	I: 3 P: 2	Low	The project will promote reforestation of degraded forests. The project targets community managed forest areas where use of forestry resources is being practiced (wood and timber).	
Risk 7: Standard 2 (Q2.2): Some of the expected outcomes of the project, particularly the forest restoration component, are sensitive to potential impacts of climate change,	I: 3 P: 2	Moderate	The project is directly addressing climate change vulnerabilities and adaptation capacities in the Kafernigan river basin, and while it directly promotes adaptation	The project's designed activities directly support implementation of ecosystem-based adaptation, including climate-smart agriculture and sustainable land management in agro-ecological landscapes. Such actions include rehabilitation and restoration of degraded forest ecosystems, vegetation growth support, water

including floods, GLOFs, etc.			measures, adverse impacts of extreme climatic events (particularly flooding, water run-off) can affect forest and agricultural areas and related livelihoods.	<p>retention measures, establishing saxaul plantations, climate-resilient crop seed planting, and others to prevent and mitigate water related adverse climatic events that have typically posed risks to livelihoods and health of target communities.</p> <p>Current and predicted climatic variability has been taken into account during project design. Throughout the inception and implementation phase, any changes in the climate will be taken into account in planning for the implementation of EbA activities. Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. Species will be planed in appropriate seasons to reduce risk of hazard impact.</p> <p>The project also aims to build climate resilience through development of catchment management strategy to manage and operationalize climate risks at district and Jamoat levels in Kafernigan river basin. As part of Early Warning Systems, the project will develop multi-hazard climate risk models (MHCRM) for vulnerable watersheds in KRB and provide technical support for the modernization of automated weather stations in the most vulnerable districts of KRB. These will help authorities and communities adequately assess risks, climate related projections and incorporate these risks in the Kafernigan River Basin Management Plans to make informed decisions on EbA activities.</p>
Risk 8: Standard 3 (Q3.1): Project may involve community safety risks from small-scale construction activities	I: 3 P: 1	Low	The ecosystem based adaptation measures may involve construction of water saving irrigation systems, rain-water harvesting systems in water-scarce zones, rehabilitation of irrigation, draining and pumping systems and on-farm water resources management.	
Risk 9: Standard 7 (Q7.4): There may be a risk of application of pesticides that may have a negative effect on the environment or human health	I: 3 P: 1	Low	Pest control measures and agricultural support may involve potential use of pesticides	
	QUESTION 4: What is the overall Project risk categorization?			
	Select one (see SESP for guidance)		Comments	
	<i>Low Risk</i>	<input type="checkbox"/>		
	<i>Moderate Risk</i>	<input checked="" type="checkbox"/>		
	<i>High Risk</i>	<input type="checkbox"/>		
	QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?			
	Check all that apply		Comments	

	<i>Principle 1: Human Rights</i>	X	The project design includes a dedicated component (Component 3) with an extensive set of capacity building actions and knowledge building and sharing at national, regional, local and community levels, based on analysis of institutional framework and related capacities carried out during the project preparation. At national level, focal institutions will be strengthened through participatory development of integrated catchment management strategy and Watershed Action Plans for the Kafernigan river basin. Coordination and training mechanisms will be strengthened within target Jamoats (sub-district government level), which includes capacity building on mainstreaming integrated catchment management (with EbA integrated) into planning and budgetary processes.
	<i>Principle 2: Gender Equality and Women's Empowerment</i>	X	Project activities will be designed and implemented so that all genders are: (a) able to participate fully and equitably, (b) receive comparable social and economic benefits, (c) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy. A gender analysis will be carried out during the Inception Phase of the project implementation to ensure this. Measures will ensure that women receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and therefore enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing women's views.
	<i>1. Biodiversity Conservation and Natural Resource Management</i>	X	The Project will be supporting activities in environmentally sensitive areas, but this work will aim at reducing impacts in these areas with a net positive impacts.
	<i>2. Climate Change Mitigation and Adaptation</i>	X	Although the project directly supports adaptation actions, adverse impacts of extreme climatic events (particularly flooding, water run-off, landslides, mudflows, and drought) may affect forest ecosystems and agricultural areas and related livelihoods.
	<i>3. Community Health, Safety and Working Conditions</i>	X	The Project will follow related environmental impact assessment procedures and ensure compliance with national construction standards and norms, sanitary norms and regulations, and other national laws and regulations (forestry, water, environment, and health). The project will also follow technical guidance and best practices regarding rain-water harvesting systems, drip-irrigation techniques, and micro-reservoirs that are not adequately institutionalized across the country. Other activities may include construction of gabions, terracing, bank enforcement and small dams, the project will assess best practices and lessons learned to address community safety risks from such construction.
	<i>4. Cultural Heritage</i>	<input type="checkbox"/>	
	<i>5. Displacement and Resettlement</i>	<input type="checkbox"/>	
	<i>6. Indigenous Peoples</i>	<input type="checkbox"/>	
	<i>7. Pollution Prevention and Resource Efficiency</i>	X	The Project will support communities to adopt improved farming techniques (organic agriculture, soil and water conservation, more resilient crop varieties) that would reduce the use of fertilizers and pesticides. Although biological pest control will be preferred, potentially harmful pesticides may be needed for specific use. In this particular case, they will be properly managed, stored, used, following

			national and international standard regulation and procedures.
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SESP Attachment 1. Social and Environmental Risk Screening Checklist

Checklist Potential Social and Environmental Risks		Answer (Yes/No)
Principles 1: Human Rights		
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalized groups?	No
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups? ³³¹	No
3.	Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	Yes
4.	Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalized groups, from fully participating in decisions that may affect them?	Yes
5.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	Yes
6.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
7.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
8.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	Yes
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
4.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? <i>For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being</i>	No
Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		

³³¹ Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? <i>For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes</i>	No
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas proposed for protection, or recognized as such by authoritative sources and/or indigenous peoples or local communities?	No
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	Yes
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	Yes
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water? <i>For example, construction of dams, reservoirs, river basin developments, groundwater extraction</i>	No
1.9	Does the Project involve utilization of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area?	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant ³³² greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	Yes
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? <i>For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding</i>	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	Yes
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	No

³³² In regards to CO₂, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No
3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	Yes
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labor standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilizing tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	Yes
5.3	Is there a risk that the Project would lead to forced evictions? ³³³	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	Yes
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples (regardless of whether indigenous peoples possess the legal titles to such areas, whether the Project is located within or outside of the lands and territories inhabited by the affected peoples, or whether the indigenous peoples are recognized as indigenous peoples by the country in question)? <i>If the answer to the screening question 6.3 is “yes” the potential risk impacts are considered potentially severe and/or critical and the Project would be categorized as either Moderate or High Risk.</i>	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.5	Does the proposed Project involve the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.6	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No

³³³ Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

6.7	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.8	Would the Project potentially affect the physical and cultural survival of indigenous peoples?	No
6.9	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	No
Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	No
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? <i>For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol</i>	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	Yes
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

Annex 7. STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT FOR THE PROVISION OF SUPPORT SERVICES

Dear Mr. Khairullo Ibodzoda,

1. Reference is made to consultations between officials of the Government of **Tajikistan** (hereinafter referred to as “the Government”) and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant programme support document or project document, as described below.
2. The UNDP country office may provide support services for assistance with direct payments. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.
3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:
 - (a) Identification and/or recruitment of project and programme personnel;
 - (b) Identification and facilitation of training activities;
 - (c) Procurement of goods and services;
4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution. Maximum possible amount of support services shall not exceed the amount indicated in the Project Document (\$132,000).
5. The relevant provisions of the **Standard Basic Assistance Agreement between the Government of the Republic of Tajikistan and UNDP signed on 03 December 1993**, (the “SBAA”), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.
6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.
7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.
8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.
9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.
10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

Yours sincerely,

Signed on behalf of UNDP
Pratibha Mehta
UNDP Resident Representative

For the Government
Mr. Khairullo Ibodzoda
Chairman of the Committee for Environmental Protection under the Government of the Republic of Tajikistan
[Date]

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between **Committee for Environmental Protection (CEP)**, the institution designated by the Government of **Tajikistan** and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed project “**An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan**”, (Project #: 00111538) “**the Project**”.

2. In accordance with the provisions of the letter of agreement signed on [insert date of agreement] and the **project document**, the UNDP country office shall provide support services for the **Project** as described below.

3. **Support services to be provided:**

Support services (insert description)	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Human Resources			
a) TOR review and post classification + creation	Jun-19	34.35	240.45
b) Advertisement	Jun-19	119.96	839.72
c) Short-listing (including long-listing)	Jun-19	239.92	1,679.44
d) Test Evaluation	Jun-19	88.83	621.81
e) Interviewing	Jun-19	239.92	1,679.44
f) Reference check	Jun-19	40.06	280.42
g) Review recruitment case	Jun-19	25.85	180.95
h) Contract issuance	Jun-19	82.38	576.66

i) Recurrent personnel management services: staff payroll & banking administration & management (for whole contract period):			0.00
<i>Payroll validation, disbursement</i>	Annual fee per employee per year)	157.04	5,653.44
<i>Extension, promotion, entitlements</i>		134.6	3,499.60
Performance evaluation		134.6	4,845.60
<i>Leave monitoring</i>		22.43	807.48
<i>Leave monitoring - Absence data management in Atlas only</i>		5.7	205.20
l) Staff HR & Benefits Administration & Management (<i>one time fee, per staff. Services incl. contract issuance, benefits enrollment, payroll setup - this price applies to the separation process as well</i>)	Yearly	205.66	1,233.96
Total, HR:			22,344.17
2. Finance			
a) Payment to vendor and staff	Daily/Monthly	38.49	27,712.80
- Urgent payments to vendor and staff (within 1 day)	Ad hoc	76.98	923.76
- Urgent payments to vendor and staff (within 3 day)	Ad hoc	57.74	1,385.76
b) Issue check only (Atlas Agencies only)	Ad hoc	16.7	501.00
- Issue check only (Atlas Agencies only - within 1 day)	Ad hoc	33.4	400.80
- Issue check only (Atlas Agencies only - within 3 days)	Ad hoc	25.05	601.20
c) Vendor profile only (Atlas Agencies only)	As per the working plan	20.66	3,099.00
AR Management Process (create/apply receivable pending item- Atlas Agencies Only)	As per the working plan	35.6	356.00
d) Journal Voucher or General Ledger Journal Entry (GLJE)	Quarterly, yearly	35.67	713.40
e) PCA reports review and certification	As per the working plan	25.8	258.00
f) F10 Settlement	As per the working plan	23.12	2,774.40
g) Issue/Apply Deposits Only	As per the working plan	21.74	217.40
Total, Finance:			38,943.52
3. Procurement			
a) Procurement not involving CAP - below US\$ 50,000			
-Identification and selection	As per the working plan	282.29	27,664.42

- Issue Purchase Order	As per the working plan	41.95	3,775.50
b) Procurement process involving CAP (and/or ITB, RFP, requirements) - above US\$ 50,000)	As per the working plan		0.00
- Identification & selection	As per the working plan	489.45	12,236.25
- Contracting/Issue Purchase Order	As per the working plan	104.07	2,601.75
c) Consultant recruitment	As per the working plan		0.00
- Advertising	As per the working plan	36.11	1,805.50
- shortlisting and selection	As per the working plan	157.13	7,856.50
- Contract issuance	As per the working plan	72.22	3,611.00
d) Procurement involving RACP (goods, services & consultant > US\$150,000)	As per the working plan		0.00
- Identification & selection	As per the working plan	582.33	1,164.66
- Contracting	As per the working plan	60.67	121.34
- Issue PO	As per the working plan	48.01	96.02
- Follow up	As per the working plan	60.67	121.34
e) Asset disposal involving CAP	By the closure of the project	275.14	2,751.40
Total, Procurement:			63,805.68
4. Admin Support			
Ticket request (booking, purchase)	As per the working plan	71.79	4,307.40
Travel cost estimates- Simple	As per the working plan	26.42	2,599.23
Total, Admin Support:			6,906.63
Total DPC			132,000.00

4. Description of functions and responsibilities of the parties involved:

As the national implementing partner, the **Committee for Environmental Protection under the Government of the Republic of Tajikistan (CEP)** will oversee all aspects of project implementation. CEP is responsible for the protection of ecosystems, protection of surface and underground water resources and monitoring the environment and natural resources, and climate monitoring. In addition, it carries out environmental assessments of various projects. The CEP structure includes local CEP representation at the district and provincial (Oblast) level. Among other tasks, district and provincial units of the CEP supervise the wastewater monitoring and control water use permit. They carry out systematic review and assessment of the environment in Tajikistan and develop standards for pollution control. The CEP will appoint National Project Coordinator (NPC) to oversee the project implementation.

Overall governance of the project will be carried out by the **Project Steering Committee**, which will include CEP, other national agencies including the Ministry of Energy and Water Resources, Ministry Agriculture and Agency for Land Reclamation and Irrigation, local Khukumat representatives and UNDP. The PSC may invite other agencies to join as members, with the roster to be definitively set and approved no later than the project's inception period. The National Project Coordinator will serve as Chair of the Project Steering Committee, with assistance from UNDP in organizing and running all meetings and other exchanges of information. Meetings of the Project Steering Committee will take place at least once annually in time for approval of the following year's Annual Work Plan. Additional meetings may be called as needed by the NPC.

UNDP will join CEP in managing the project and providing quality assurance, in accordance with plans approved by the Project Steering Committee. Most of UNDP's work for the project will be based in its Country Office (CO) in Dushanbe, under the supervision of the Team Leader for Disaster Risk Reduction, Environment and Energy and other senior programme staff, including the UNDP Resident Representative and UNDP Country Director as warranted.

UNDP will also engage contractors to carry out Midterm and Final Evaluations of the project. The UNDP Regional Technical Advisor, based in the UNDP Regional Service Centre in Istanbul, will provide technical support, assistance with coordination, and overall project monitoring to ensure consistency with expectations from UNDP and Adaptation Fund.

The day-to-day operations of the project will be carried out by six full-time project staff, headed by the **Project Manager**. The Project Manager will be responsible for carrying out the activities of the project as set forth in this Project Document and any revisions approved by the Project Steering Committee. At least one month in advance of the start of each project year, the Project Manager will prepare Annual Work Plans. These plans will be reviewed and approved by the Project Steering Committee and thereafter will be used by project staff as tools for planning, implementing, and tracking work flows. In addition, for each meeting of the Project Steering Committee, the Project Manager will prepare a full status report on project activity, including recent accomplishments, risks, and proposed mitigation measures. The Project Manager will also be responsible for preparing all required annual reports for UNDP and Adaptation Fund.

UNDP country office staff will assist the Project Manager in all the administrative work of the project, including logistics and clerical work. In addition, the country office will provide administrative support to the Government with regard to various specific administrative functions, whose costs will be billed as Direct Project Costs according to this Letter of Agreement.

Responsibilities of other entities of the Government are set forth in the table below.

Maximum DPC amount to be charged to AF fund is USD 132,000.

Annex 8. UNDP FEES FOR SUPPORT TO ADAPTATION FUND PROJECT

“An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan”

Category	Services Provided by UNDP	UNDP Fee (8.5%)
Identification, Sourcing and Screening of Ideas	<p>Provide information on substantive issues in adaptation associated with the purpose of the Adaptation Fund (AF).</p> <p>Engage in upstream policy dialogue related to a potential application to the AF.</p> <p>Verify soundness & potential eligibility of identified idea for AF.</p>	\$ 39,157
Feasibility Assessment / Due Diligence Review	<p>Provide up-front guidance on converting general idea into a feasible project/programme.</p> <p>Source technical expertise in line with the scope of the project/programme.</p> <p>Verify technical reports and project conceptualization.</p> <p>Provide detailed screening against technical, financial, social and risk criteria and provide statement of likely eligibility against AF requirements.</p> <p>Determination of execution modality and local capacity assessment of the national executing entity.</p> <p>Assist in identifying technical partners. Validate partner technical abilities.</p> <p>Obtain clearances from AF.</p>	\$ 117,470
Development & Preparation	<p>Provide technical support, backstopping and troubleshooting to convert the idea into a technically feasible and operationally viable project/programme.</p> <p>Source technical expertise in line with the scope of the project/programme needs.</p> <p>Verify technical reports and project conceptualization.</p> <p>Verify technical soundness, quality of preparation, and match with AF expectations.</p> <p>Negotiate and obtain clearances by AF. Respond to information requests, arrange</p>	\$ 156,626.20

	revisions etc.	
Implementation	<p>Technical support in preparing TORs and verifying expertise for technical positions. Provide technical and operational guidance project teams.</p> <p>Verification of technical validity / match with AF expectations of inception report.</p> <p>Provide technical information as needed to facilitate implementation of the project activities. Provide advisory services as required.</p> <p>Provide technical support, participation as necessary during project activities.</p> <p>Provide troubleshooting support if needed. Provide support and oversight missions as necessary.</p> <p>Provide technical monitoring, progress monitoring, validation and quality assurance throughout.</p> <p>Allocate and monitor Annual Spending Limits based on agreed work plans.</p> <p>Receipt, allocation and reporting to the AFB of financial resources.</p> <p>Oversight and monitoring of AF funds. Return unspent funds to AF.</p>	\$ 352,408
Evaluation and Reporting	<p>Provide technical support in preparing TOR and verify expertise for technical positions involving evaluation and reporting.</p> <p>Participate in briefing / debriefing.</p> <p>Verify technical validity / match with AF expectations of all evaluation and other reports</p> <p>Undertake technical analysis, validate results, and compile lessons.</p> <p>Disseminate technical findings</p>	\$ 117,470
Total		\$ 783,131

Annex 9. COST BENEFIT ANALYSIS OF PROPOSED COMMUNITY-LEVEL ADAPTATION MEASURES

Table 3. Cost benefit analysis for community-level adaptation measures proposed for Vahdat, Fayzabad and Varzob Districts.

Measure	Benefits assessed	Internal Rate of Return (IRR)	Benefit cost ratio (BCR)	Payback period (years)
1. Terracing	Increase the cultivation of fruits, berries and wild fruit trees	45%	6,5:1	3
2. Bio-drainage	Planting trees leads to a decrease in groundwater, which leverages yield to 15-20%	25%	4,5:1	5
3. Stone lines	Reduce the impact of natural disasters, including floods and landslides	10%	3:1	8
4. Stone and/or organic mulching of croplands	Increase the yield of agricultural crops by 25-30%. Saving water, reducing soil degradation.	25%	6,5:1	2
5. Diversification of crops and use of drought-resilient crops	Create a condition for the production of competitive products on the market, the use of drought-resistant crops and mitigating the impact of climate change, increase yield by 25-30%	40%	6,5:1	4
6. Horticulture in greenhouses	It will enable to produce lemons and vegetables all throughout the year. Increase the yield by 40-50%.	50%	7,5:1	6
7. On-and off-farm agroforestry	Agro forest land reclamation will ensure the radical improvement of land through the use of soil-protective, water-regulating and other properties of protective forest plantations.	40%	6,5:1	5
8. Planting of woodlots for fuel wood and timber	Reduce unauthorized deforestation of natural forests, reduce the costs fuel for cooking and of heating houses.	30%	8:1	4
9. Rehabilitation/Restoration of degraded forest ecosystems e.g. planting indigenous trees in micro-basins	Increase the area of forest plantations, reduce soil degradation and mitigate the impact of natural disasters.	10%	4:1	8
10. Sustainable harvesting from intact forest ecosystems as well as indigenous forests rehabilitated/restored in degraded areas	Ensure food security for households, in particular the most vulnerable. Will create a condition for selling the collected products in external markets	30%	6:1	1
11. Sowing of indigenous grass seeds (primarily palatable species) in degraded rangelands	Increase pasture productivity and productivity of livestock products by 20-25%	20%	6:1	2
12. Rotational grazing practices	Reduce degradation and increase pasture productivity and pasture restoration	15-20%	5:1	3
13. Climate/drought resilient seed varieties	Foster production of competitive products on the market, the use of drought-resistant crops to reduce the impact of climate change, increase yield by 25-30%	40%	6,5:1	4
14. Intercropping	Foster rational land use, increases the yield and profitability of farmers	30	10:1	2
15. Seed system support measures, seed banks	Improve farmers' access to quality seeds, reduce risks of sowing substandard seed materials, increase yield by 20-30%.	25	8:1	5
16. Extension advisory services	To raise the level of awareness and knowledge of farmers in the	15	4:1	4

Measure	Benefits assessed	Internal Rate of Return (IRR)	Benefit cost ratio (BCR)	Payback period (years)
	production sphere, storage and sale of products			
17. Rehabilitation of degraded lands and land degradation control through pasture management	Reduce degradation and increase pasture productivity and pasture restoration.	15-20%	5:1	3
18. Soil fertility	Increase the yield of agricultural crops, which will affect the increase in the profitability of farmers	40%	12:1	3
19. Sustainable sloping lands cultivation – including agroforestry, orchards, woodlots and shelter-belts	Reduce the degradation of sloping lands, ensure the substantial improvement of land through the use of soil-protective, water-regulating and other properties of protective forest plantations, increase the area of forest plantations.	45%	10:1	7
20. Joint forest management (including agroforestry)	Increase the responsibility for the conservation of forest plantations, increase the yield of forest plantations and the profitability of households through rational use of forests	25%	8:1	6
21. Energy efficiency stoves	Reduce the use of fuel for cooking and heating the premises by an average of 30-40%, which will affect the reduction of household expenses	25%	9:1	2
22. Establishment of pasture use groups	Advance the rational use of pastures, increasing productivity and restoring pastures, including improving passages for livestock, access to water	40%	8:1	5
23. Nursery development for forest expansion	Improve access to seedlings at lower prices to restore and expand forests. The development of nurseries will provide an opportunity to expand and restore forests (seedlings adapted to local conditions).	30%	6:1	7
24. Capacity building on community level on climate change adaptation (seminars, trainings) including women	Improve awareness of the population, especially women and the most vulnerable, in adapting to climate change in agricultural production	25%	6:1	5
25. Demonstration plots for effective water use and other adaptation actions with consideration of climate change	Enhance awareness of the population, especially women and the most vulnerable, in adapting to climate change in agricultural production	35%	5:1	4

Table 4. Cost benefit analysis for community-level adaptation measures proposed for Kabodiyon, Shaartuz and Nosiri-Khusrav Districts.

Measure	Benefits assessed	Internal Rate of Return (IRR)	Benefit cost ratio (BCR)	Payback period (years)
1. Bio-drainage	Planting trees leads to a decrease in groundwater to increase yield to 15-20%	25%	4,5:1	5
2. Establishment of saxaul plantations	Improve farmers' access to saxaul saplings, which in turn will reduce the impact of sand drills and the conservation of agricultural land	40%	8:1	6

Measure	Benefits assessed	Internal Rate of Return (IRR)	Benefit cost ratio (BCR)	Payback period (years)
3. Commercial plantations in salinized/degraded lands	To reduce salinity and land degradation, and enable to increase the area of agricultural land	30%	9:1	7
4. Organic mulching of croplands	Increase the yield of agricultural crops by 25-30%. Saving water, reducing soil degradation.	25%	6,5:1	2
5. Diversification of crops and use of drought-resilient crops	Create a condition for the production of competitive products on the market, the use of drought-resistant crops and mitigating the impact of climate change, increase yield by 25-30%	40%	6,5:1	4
6. Horticulture in greenhouses (lemon, tomato, cucumber)	It will enable to produce lemons and vegetables all throughout the year. Increase the yield by 40-50%.	50%	7,5:1	6
7. On-and off-farm agroforestry	Agro forest land reclamation will ensure the radical improvement of land through the use of soil-protective, water-regulating and other properties of protective forest plantations.	40%	6,5:1	5
8. Planting of woodlots for fuelwood and timber	Reduce unauthorized deforestation of natural forests, reduce the costs fuel for cooking and of heating houses.	30%	8:1	4
9. Rehabilitation/restoration of degraded forest ecosystems e.g. planting indigenous trees in micro-basins	Increase the area of forest plantations, reduce soil degradation and mitigate the impact of natural disasters.	10%	4:1	8
10. Sowing of indigenous grass seeds (primarily palatable species) in degraded rangelands	Increase pasture productivity and productivity of livestock products by 20-25%	20%	6:1	2
11. Rotational grazing practices	Reduce degradation and increase pasture productivity and pasture restoration	15-20%	5:1	3
12. Climate/drought resilient seed varieties	Foster production of competitive products on the market, the use of drought-resistant crops to reduce the impact of climate change, increase yield by 25-30%	40%	6,5:1	4
13. Intercropping	Foster rational land use, increases the yield and profitability of farmers	30	10:1	2
14. Seed system support measures; seed banks	It will improve farmers' access to quality seeds, reduce risks of sowing substandard seed materials, increase yield by 20-30%.	25%	8:1	5

Measure	Benefits assessed	Internal Rate of Return (IRR)	Benefit cost ratio (BCR)	Payback period (years)
15. Extension advisory services	To raise the level of awareness and knowledge of farmers in the production sphere, storage and sale of products	15%	4:1	4
16. On-farm water resource management and efficiency improvement measures	Increase the efficiency of using the on-farm irrigation system, improve farmers' access to irrigation water	40-50%	5:1	3
17. Rehabilitation of degraded lands and land degradation control through pasture management	Reduce degradation and increase pasture productivity and pasture restoration	15-20%	5:1	3
18. Soil fertility	Increase the yield of agricultural crops, which will affect the increase in the profitability of farmers	40%	12:1	3
19. Sustainable sloping lands cultivation – including agroforestry, orchards, woodlots and shelter-belts	Reduce the degradation of sloping lands, ensure the substantial improvement of land through the use of soil-protective, water-regulating and other properties of protective forest plantations, increase the area of forest plantations.	45%	10:1	7
20. Joint forest management	Increase the responsibility for the conservation of forest plantations, increase the yield of forest plantations and the profitability of households through rational use of forests	25%	8:1	6
21. Agroforestry	Agro forest land reclamation will ensure the gradual improvement of land through the use of soil-protective, water-regulating and other protective forest plantations.	40%	6,5:1	5
22. Capacity building on community level on climate change adaptation (seminars, trainings) including women	Improve awareness of the population, especially women and the most vulnerable, in adapting to climate change in agricultural production	25%	6:1	5
23. Demonstration plots for effective water use and other adaptation actions with consideration of climate change	Enhance awareness of the population, especially women and the most vulnerable, in adapting to climate change in agricultural production	35%	5:1	4

Annex 10. WORKPLAN

The tentative workplan for the proposed project is presented in the table below. This workplan indicates the proposed duration for activities under each output, as well as the expected year in which the output is expected to be delivered.

Components and Outputs		Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1. Integrated catchment management to build climate resilience.	Output 1.1. Multi-hazard climate risk models developed for vulnerable watersheds in the Kofirnighan River Basin.																				
	Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.																				
	Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.																				
	Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.																				
	Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.																				
Component 2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.	Output 2.1. Agro-ecological extension services supported at the <i>jamoat</i> level to provide technical support for EbA implementation.																				
	Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities.																				
	Output 2.3. EbA interventions implemented in target																				

	watersheds by local communities.																			
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin.	Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.																			
	Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.																			

Annex 11. BUDGET

Award ID	00113350		Project ID		00111538							
Project Title	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan											
Business Unit	TJK10											
PIMS No.	PIMS 6219											
Implementing Partner	Committee for Environmental Protection (CEP)											
Outcome/ Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Don or Name	Atlas Budget ary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget Notes
Component 1. Integrated catchment management to build climate resilience.	UNDP/CEP	62040	AF	71200	International consultant	83,500	69,000	-	-	-	152,500	1
				71300	Local consultant	81,000	74,000	30,000	-	-	185,000	2
				71600	Travel	10,000	10,000	10,000	10,000	-	40,000	3
				72100	Contractual Services-Companies	40,000	-	10,000	10,000	10,000	70,000	5
				72300	Materials & Goods	70,000	70,000	70,000	-	-	210,000	7

				72400	Audio Visual&Print Prod Costs	-	15,000	5,000	5,000	5,000	30,000	6
				74500	Miscellaneous Expenses	20,000	10,000	10,000	10,000	10,500	60,500	8
				75700	Training, Workshops and Confer	98,000	88,000	63,000	15,000	-	264,000	4
					Total Outcome 1	402,500	336,000	198,000	50,000	25,500	1,012,000	
Component 2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.	UNDP/C EP			71300	Local consultant	-	100,000	-	-	-	100,000	2
				71400	Contractual Services - Individ	36,000	36,000	36,000	36,000	36,000	180,000	10
				71600	Travel	15,000	15,000	15,000	14,000	15,000	74,000	3
				72100	Contractual Services-Companies	-	3,358,000	2,123,500	1,123,500	123,500	6,728,500	5
				74200	Audio Visual&Print Prod Costs	-	24,310	-	-	-	24,310	9
				75700	Training, Workshops and Confer	20,000	75,000	48,000	18,000	15,000	176,000	4
					Total Outcome 2	71,000	3,608,310	2,222,500	1,191,500	189,500	7,282,810	
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.	UNDP/C EP	62040	AF	71200	International consultant	36,500	-	-	-	-	36,500	1
				71600	Travel	1,000	1,000	1,000	1,000	1,000	5,000	3
				72100	Contractual Services-Companies	20,000	20,000	12,000	19,000	20,000	91,000	5
				74500	Miscellaneous Expenses	10,000	-	-	-	-	10,000	8
					Total Outcome 3	67,500	21,000	13,000	20,000	21,000	142,500	
Project Execution Cost	UNDP	62040	AF	71400	Contractual Services - Individ	85,000	85,000	85,000	85,000	85,000	425,000	10
				71600	Travel	7,000	7,000	7,000	7,000	7,000	35,000	3
				72200	Equipment and Furniture	60,000	-	-	-	-	60,000	14
				72400	Communic & Audio Visual Equip	2,500	2,500	2,500	2,500	2,500	12,500	11
				73100	Rental & Maintenance-Premises	5,000	5,000	5,000	5,000	5,000	25,000	12

				73400	Rental & Maint of Other Equip	5,000	5,000	5,000	5,000	2,500	22,500	15
				74100	Professional Services	1,000	1,000	29,000	1,000	29,000	61,000	13
				74596	Direct project cost	17,000	36,000	43,000	26,000	10,000	132,000	16
				75700	Training, Workshops and Confer	3,000	-	-	-	-	3,000	4
					Total project execution cost	185,500	141,500	176,500	131,500	141,000	776,000	
Total Project Costs						726,500	4,106,810	2,610,000	1,393,000	377,000	9,213,310	

Budget note number	Budget Notes
1	International consultant (daily fee of US\$650 * 50 days + US\$4,000 air fare) for Multi-Hazard Climate Risk Modeling; International consultant (IT expert - daily fee of US\$650 * 30 days + US\$4,000 air fare) for collecting and collating data; International Consultant (Catchment management expert - daily fee of US\$650 for 100 days + US\$4,000 air fare) on climate strategy; International Consultant (Training expert on integrated catchment management, daily fee of US\$ 650 for 30 days + US\$ 4,000 air fare) to develop a Training programme on integrated catchment management; International consultant (US\$650 * 50 days + US\$4,000 air fare) for development of an evaluation framework
2	National consultant to conduct gap analyses (US\$200*125 days) National consultants to support development of Multi-Hazard Climate Risk Models (US\$200*100 days) National consultants to support data collection and collation (US\$200*50 days) National consultants to support trainings of local community members to receive advisories (US\$200*150 days) National consultants to support the development of the climate strategy (2pers* US\$200*100 days) National consultants to assist international consultants in conducting training programme on integrated catchment management and to continue training workshops in Year 2 (US\$200*100 days) National Environmental Economist and National Policy Expert, for development of PES models (2 pers.*US\$200*100 days) National Watershed Expert for participatory mapping (US\$200 for 150 days) National Communications Expert for participatory mapping (US\$200 for 150 days) National consultants on WAPs development (2pers.*US\$200*100days)
3	Travel to target districts
4	Workshops (10 district-level workshops and 3 national-level workshops) on climate strategy; - \$25,000 Training workshops (6 3-day workshops @US\$5,000 per workshop) on integrated catchment management + training materials - \$50,000; Training materials, trainings (assume US\$10,000 for training materials, 2 trainings per year per jamoat at US\$1,000 per training); - \$94,000 Workshops for RBOs, RBCs, districts and jamoats. Assume 1 workshop in each district + 2 workshops in Dushanbe on strengthening the coordination systems - \$50,000 Workshops for CEP and other relevant government staff on integrating EbA in catchment management - \$20,000 Workshops at district and national level (12 district-level workshop, 3 national-level workshops) on PES model development - \$55,000 Training for EbA and FFS service providers - \$91,000 Community meetings (Meetings to be held across multiple villages; assume 3 meetings per jamoat, US\$500 per meeting) on participatory mapping - \$21,000 Workshop per jamoat on developing community monitoring plans - \$20,000 + Inception workshop - \$3,000 Training for Nursery staff - \$14,000

5	Contractual Services for GIS multihazard climate risk data modeling for first year - \$40,000. Contract for disseminating regular advisories via SMS - \$30,000 Contractual services for civil works / Contract for knowledge management centre - database maintenance, knowledge dissemination - \$91,000 EbA demonstration plots for villages – 100 villages, US\$3,000 per plot to be established, plus US\$200 for upkeep for each EbA plot per annum * 3 years - \$360,000 14 nurseries, US\$10,000 to establish each nursery and US\$973.22 upkeep for each nursery per annum * 4 years - \$194,500 Inputs for 100 villages to implement EbA - estimated US\$58,140 per village - \$5,814,000 Farmer field schools - 100 villages, assume US\$900 per field school per annum - \$360,000
6	Basic phones + airtime for 100 community representatives;
7	Materials and inputs for 3 AWS Stations (US\$70,000 per station * 3 stations) - \$210,000
8	Miscellaneous Expenses (including bank charges, insurance);
9	Printing of mapping materials (\$2,310) + printing & miscellaneous (\$10,000) + translation services (\$12,000)
10	All project personnel fees (Project Manager, Administrative/Finance Assistant, Field staff (3 @ US7,000 p.a.) Programme Assistant, Project Analyst, Project Engineer)
11	Communication cost (internet, mobile and landline phones);
12	Office rent
13	Mid-term review of the project by team of consultants (28,000 USD); Final review of the project by team of consultants (28,000 USD); Audit Fees (5,000 USD)
14	Procurement of vehicle for visits to target districts for implementation of project activities;
15	All cost associated with vehicle running, like regular maintenance, etc.;
16	Expenditures for the services on HR, procurement, IT, security provided by CO.

Annual expenditure per output						
Output	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Output 1.1. Multi-hazard climate risk models developed for vulnerable watersheds in the Kofirnighan River Basin.	\$ 111,500	\$ 10,000	\$ -	\$ -	\$ -	\$ 121,500
Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.	\$ 133,500	\$ 105,000	\$ 105,000	\$ 25,000	\$ 25,500	\$ 394,000
Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.	\$ 92,500	\$ 156,000	\$ 58,000	\$ 15,000	\$ -	\$ 321,500
Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	\$ 35,000	\$ 10,000	\$ 25,000	\$ -	\$ -	\$ 70,000

Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.	\$ 30,000	\$ 55,000	\$ 10,000	\$ 10,000	\$ -	\$ 105,000
Output 2.1. Agro-ecological extension services supported at the <i>jamoat</i> level to provide technical support for EbA implementation.	\$ -	\$ 390,000	\$ 140,000	\$ 110,000	\$ 110,000	\$ 750,000
Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities.	\$ 36,000	\$ 181,310	\$ 36,000	\$ 36,000	\$ 36,000	\$ 325,310
Output 2.3. EbA interventions implemented in target watersheds by local communities.	\$ 35,000	\$ 3,037,000	\$ 2,046,500	\$ 1,045,500	\$ 43,500	\$ 6,207,500
Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	\$ 20,000	\$ 20,000	\$ 12,000	\$ 19,000	\$ 20,000	\$ 91,000
Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.	\$ 47,500	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 51,500
PMC	\$ 185,500	\$ 141,500	\$ 176,500	\$ 131,500	\$ 141,000	\$ 776,000
					Grand Total:	\$ 9,213,310

Annual expenditure by activity						
Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1.1.1. Conduct a gap analysis on existing risk information in the Kofirnighan River Basin.	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ 25,000
1.1.2. Develop Multi-Hazard Climate Risk Models for the Kofirnighan River Basin.	\$ 86,500	\$ 10,000	\$ -	\$ -	\$ -	\$ 96,500
1.2.1. Provide technical support for the modernisation of automated weather stations in the most vulnerable districts of the Kofirnighan River Basin.	\$ 90,000	\$ 80,000	\$ 80,000	\$ 10,000	\$ 10,500	\$ 270,500

1.2.2. Collect and collate data from improved automated weather stations.	\$ 33,500	\$ -	\$ -	\$ -	\$ -	\$ 33,500
1.2.3. Use collected data to inform climate risk information and adaptation advisories for agro ecological extension service providers.	\$ 10,000	\$ 25,000	\$ 25,000	\$ 15,000	\$ 15,000	\$ 90,000
1.3.1. Develop an integrated catchment management strategy for the Kofirnighan River Basin to inform and facilitate cross-sectoral landscape planning.	\$ -	\$ 89,000	\$ 30,000	\$ 15,000	\$ -	\$ 134,000
1.3.2. Deliver a training programme on mainstreaming climate risks for integrated catchment management planning.	\$ 54,500	\$ 39,000	\$ -	\$ -	\$ -	\$ 93,500
1.3.3. Provide training for selected communities on identification of EbA activities and implementation.	\$ 38,000	\$ 28,000	\$ 28,000	\$ -	\$ -	\$ 94,000
1.4.1. Strengthen existing training mechanisms at the raion and jamoat levels.	\$ 25,000	\$ -	\$ 25,000	\$ -	\$ -	\$ 50,000
1.4.2. Provide training on integrating EbA into catchment management.	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	\$ 20,000
1.5.1. Develop suitable Payment for Ecosystem Services models for the KRB.	\$ 30,000	\$ 55,000	\$ 10,000	\$ 10,000	\$ -	\$ 105,000
2.1.1. Support agro-ecological extension services by training existing service providers on EbA, climate-resilient agriculture and multi-hazard climate risk management.	\$ -	\$ -	\$ 30,000	\$ -	\$ -	\$ 30,000
2.1.2. Establish EbA demonstration plots in each of the target villages.	\$ -	\$ 300,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 360,000
2.1.3. Conduct farmer field schools (FFs) in target villages making use of demonstration plots.	\$ -	\$ 90,000	\$ 90,000	\$ 90,000	\$ 90,000	\$ 360,000

2.2.1. Conduct participatory mapping at the watershed level.	\$ 36,000	\$ 119,310	\$ 36,000	\$ 36,000	\$ 36,000	\$ 263,310
2.2.2. Develop Watershed Action Plans (WAPs) for vulnerable watersheds in the Kofirnighan River Basin.	\$ -	\$ 62,000	\$ -	\$ -	\$ -	\$ 62,000
2.3.1. Support local communities to implement priority EbA interventions.	\$ -	\$ 2,982,000	\$ 2,013,500	\$ 1,013,500	\$ 13,500	\$ 6,022,500
2.3.2. Support local community members in developing Enterprise Plans (EPs) based on EbA interventions.	\$ 20,000	\$ 20,000	\$ 18,000	\$ 18,000	\$ 15,000	\$ 91,000
2.3.3. Monitor the impacts of EbA interventions.	\$ 15,000	\$ 35,000	\$ 15,000	\$ 14,000	\$ 15,000	\$ 94,000
3.1.1. Support existing knowledge management platforms responsible for collating, analysing and disseminating information on climate risks and suitable adaptation options.	\$ 20,000	\$ 20,000	\$ 12,000	\$ 19,000	\$ 20,000	\$ 91,000
3.1.2. Collect and collate data and information from automated weather stations, agro ecological extension centres and international publications.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3.2.1. Establish an impact evaluation framework to enable the effective quantification of project benefits and to provide information for future planning and implementation of EbA interventions.	\$ 46,500	\$ -	\$ -	\$ -	\$ -	\$ 46,500
3.2.2. Obtain data and information through applying the framework will be disseminated via the knowledge platform(s).	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 5,000
PMC	\$ 185,500	\$ 141,500	\$ 176,500	\$ 131,500	\$ 141,000	\$ 776,000
					Grand Total	\$ 9,213,310



ADAPTATION FUND

United Nations Development Programme

MARGINALIZED AND VULNERABLE GROUPS/ GENDER ANALYSIS:

“Prioritization of vulnerable communities and groups for climate change adaptation interventions in selected districts of Kafernigan River Basin”



Towards development of the Project Proposal –
“*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*”

10 April 2019

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1. INTRODUCTION

Tajikistan is a small landlocked country in the heart of Central Asia, bordered by Afghanistan, China, the Kyrgyz Republic, and Uzbekistan. The country has abundant water resources, contributing to its specialization in cotton production and a considerable hydropower generation potential. Only 7 percent of its total land area of 143,000 square kilometers is arable. High mountain ranges across its territory make communication between different parts of the country difficult, especially in winter. Tajikistan is highly susceptible to natural disasters, and is regularly affected by floods, landslides, and droughts. Up to 40 percent of the country's national workforce is employed abroad (mostly in Russia) and sends home remittances equal to more than one-third of its gross domestic product. However, with global financial crisis and economic downfall in Russia associated with sanctions the remittance incomes are already adversely affected. Preliminary forecasts from IMF and the World Bank suggest that remittance income will fall by more than the 31% fall in remittance income. Lastly, low agricultural productivity and rudimentary safety nets still leave those below the poverty line vulnerable to shocks and stresses, including women who have experienced lowered rates of poverty reduction than men. The above factors combine to make Tajikistan one of the poorest and most vulnerable economies in the world.

In particular, climate change causes great problems for Tajikistan, since the country is highly vulnerable to it and has a relatively low adaptive capacity. The World Bank identifies Tajikistan as the most vulnerable country in Central Asia³³⁴. Out the 180 countries ranked by the global adaptation index of the University of Notre Dame, Tajikistan ranked on 111 place. Tajikistan ranked 78th amongst the most vulnerable countries and 52nd amongst the less prepared countries. Compared to other countries in the index, its current state of vulnerability is manageable. However, improvement in readiness is necessary, if it is done, in order to become better adapted to future climate change and climate-related difficulties³³⁵. In the Index of Long-Term Climate Risks, Tajikistan is ranked 29th³³⁶.

Extreme climatic events (such as floods, droughts, avalanches, landslides) periodically destroy land, crops, infrastructure and sources of income. Annual losses from climate change and extreme climate events are estimated at \$600 million, or 4.8% of Tajikistan's gross domestic product (GDP). Climate-induced losses will increase with increasing levels of temperature and precipitation³³⁷. By 2030, the average temperature is projected to increase by 2.3 ° C. The average amount of precipitation is likely to increase by 8% in areas up to 2500 m above sea level and decrease by 3% in mountainous areas.

Climate change can harm Tajikistan by affecting a variety of different social, cultural, economic and natural resources. More frequent extreme climatic events can adversely affect the functioning and stability of both anthropogenic and natural systems, as well as further exacerbating the losses caused by climate change. Unless robust measures are taken to reduce

³³⁴ Gelbert R. Reva A. Zaidi S. 2012, Tajikistan, Economic and distributional impacts of climate change (No. 10047). The World Bank.

³³⁵ Notre Dame Global Adaptation Index. <http://index.gain.org/country/tajikistan>

³³⁶ Craft S., Eckstein D., Dorsch L., and Fisher L., 2015 Global Climate Risk Index 2016: Who suffers the most from extreme weather events? Losses due to weather in 2014, a comparison of 1995 to 2014.

³³⁷ UNDP (2012). Tajikistan: Poverty in the context of climate change; National Human Development Report 2012. Dushanbe: United Nations Development Programme

vulnerability and enhance adaptation, the country is likely to experience significant additional economic losses, humanitarian problems and environmental degradation. Climate change affects everyone, but this does not mean that everyone has the same level of vulnerability to it. Some groups are more vulnerable than others. For example, climate change impacts and adaptability are not gender neutral.

Unless urgent and timely action is taken, Tajikistan will suffer tremendously. It is in the context of this reality that Tajikistan's National Development Strategy until 2030 outlines hazard risk reduction along with adapting to climate change as critical for the country to achieve its long-term sustainable development goals and objectives. To give effect to this, Tajikistan has tapped into a number of funding sources and is implementing several related projects. In 2018, Tajikistan made a significant step towards advancing the climate change adaptation agenda by tapping into another such source with the endorsement of its Project Concept Note for Adaptation Fund Project. The endorsement paves the way for the development of the full project proposal, that will be undertaken by UNDP in Tajikistan in partnership with the Committee for Environmental Protection, under the project "Facilitating Climate Resilience in Tajikistan" funded by the Russian Trust Fund for Development.

2. PURPOSE

In September 2018, UNDP has developed a draft project proposal – “*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*” to the Adaptation Fund. Following the submission of the proposal to the Adaptation Fund, UNDP received an official response on 1 April 2019 from the AF Board suggesting that UNDP reformulate the proposal, taking into account the observations in the review sheet annexed to the notification of the Board’s decision, as well as the following issues:

- a. The fully-developed proposal should submit a revised Environmental and Social Policy risk identification analysis including the significance of the risk identified (e.g. low, medium, high), the outcome of the screening process indicating the risks that may be triggered, as well the relevant environment and social assessments in compliance with the Adaptation Fund Environmental and Social Policy principles;
- b. Since the priority list of ecosystem-based adaptation (EbA) sub-projects that constitute over US\$ 6 million of the budget have been identified, the assessments mentioned in Section V, Annex 4 (gender analysis, marginalized and vulnerable groups assessment, ecological and land use assessment, pasture use assessment and other relevant assessments) should be submitted along with the resubmitted proposal;

The purpose of this report is therefore to address “Item B” (as above), specifically in part to provide (i) Gender Analysis, and (ii) Marginalized and vulnerable groups assessment. The given targeted analysis and assessment would provide further insight into anticipated risks, mitigation/management measures to be carried out for sub-projects identified for implementation within the framework of the project.

“Marginalized and vulnerable groups assessment” section of the report will provide the results of data collection and consultations about currently identified marginalized and vulnerable communities and groups in selected target districts of Kafernigan River Basin. In effect, such communities will be considered as priority where adaptation interventions will be implemented by the project.

“Gender Analysis” section of the report will provide an overview of gender issues in the context of climate change and the developed project proposal, i.e. disparities and vulnerabilities, risks and challenges concerning due participation in project implementation and acquiring equal benefits from project implementation along with other beneficiaries of the project. The report will also assess the role of women, division of labor, and access to resources in order to develop recommendations on how the project will promote women’s equality and empowerment.

3. METHODOLOGY

The present reports has been prepared from a series of sources both qualitative and quantitative related and consists of three main parts. The first part of the report, Sections 4 and 5, defines marginalized and vulnerable groups in Tajikistan in the context of climate change, and presents an overview of vulnerable communities in six selected districts of Kafernigan river basin, namely – Fayzabad, Varzob and Vahdat of upstream KRB, as well as Qabodiyon, Nosiri Khisrav and Shaartuz districts of downstream KRB. Information for this part of the report was compiled mainly from most recent comprehensive District Development Plans. Section 5, in particular, provides list of communities that have most been affected by climate change with indication of types of adverse climatic events. Such information will be critical in short-listing of targeted communities during the implementation of the propoed Project “*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*”.

The second part of the report provides a general overview of gender and climate change in Tajikistan. It provides a review of key policies, a summary of conducted assessments and reviews from desk analysis (impact of climate change on women of Tajikistan), and a review of gender aspects in (a) land resource use and management, (b) natural disasters risk management and mitigation, (c) water resources management, (d) pasture and forest resources management, (e) community resilience to climate change. The source of both qualitative and quantitative data provided in this part of the report have been collected from published assessments and reports for partner development organizations and government agencies. Information from this part of the report is meant to provide insights on the vulnerabilities of women in different related sectors in the context of climate change, and the challenges that vulnerable women face. This information will further help identify (short-list) most affected communities with vulnerable women who can adequately benefit from the proposed Project.

The third part of the report is the summary and analysis of Focused Group Discussions held with women groups in the six project target districts of KRB. The discussions were held during 19-26 December 2018 as part of the Stakeholder Consultation Missions. The mission’s objective was to acquire additional field level information and consult with local stakeholders including local authorities (Community members, Jamoats, district departments) and local specialized institutions in order to prioritize demonstration activities from suggested list of proposed actions by the Project within target districts. Where applicable, the mission also gathered relevant baseline data that was available and relevant for the project implementation. The Stakeholder Consultation process included the following:

- (a) Focused group discussions to assess validity and feasibility of each of the proposed actions by the Project. This also includes prioritization of intended demonstration activities separately for each target district.
- (b) Focused group discussions to stock-take major events and extent of consequences, insurance and compensatory schemes, adaptation measures implemented by target communities and local authorities. Where applicable, the mission have also assessed local adaptation capacities.
- (c) Discussion of Grievance Redress Mechanisms with consideration of local specifics tailor-made for target river basin.

The outcomes of the given Consultations are intended to provide basis for a comprehensive Stakeholder Engagement Plan that is to be developed and implemented by the proposed Project. The Stakeholder Consultation Mission was comprised of six individuals, i.e. Consultants and

UNDP DRMP support staff. The consultants involved were chosen with consideration of the following main criteria:

- Knowledge and expertise in areas of climate change and environment;
- Previous experience in carrying out stakeholder consultations and assessments, as well as expertise in designing and implementing surveys and focused group discussions;
- Knowledge of gender problems and gaps in climate change and environment, as well as experience in gender assessments and gender mainstreaming in project design; and
- Knowledge and application of local dialects of Tajik and Uzbek languages found to be relevant in target districts.

#	Mission Member – Name	Position	Role
1	Mr. Firuz Saidov	National Consultant on Environment and Climate Change	Lead Moderator/ Facilitator, data collection.
2	Mr. Shukhrat Igamberdyev	National Consultant on Environmental and Social Management Plan	Assistant Moderator, data collection, Rapporteur
3	Ms. Sojidamo Tagaeva	National Consultant on Gender	Assistant Moderator/ Facilitator of Focus Group Discussions with Women
4	Mr. Odina Sharifov	UNDP DRMP Administrative Assistant	Logistical and administrative support
5	Mr. Ahmadjon Kadirov	UNDP DRMP IT Specialist	Logistical and administrative support
6	Mr. Zafar Jumaev	UNDP DRMP Driver	Logistical and administrative support

For the desk (secondary) analysis, the existing sources of the problem study were used. For example, during the analysis of regulatory documents, programs and strategies, all official government documents related to gender aspects of climate change were analyzed. Some of the information was collected from the official websites of government organizations, the missing information was obtained directly from these organizations. Statistical information on the gender aspects of climate change was obtained from the official website of the Statistical Agency under the President of the Republic of Tajikistan (<https://www.stat.tj/ru>), as well as from a database of studies conducted by international and local organizations.

In the course of the assessment, qualitative research methods and, as well as semi-structural interviews were also used. Semi-structural interviews were conducted with the following key partners: with managers and specialists of international organizations working on gender aspects of climate change, local non-governmental organizations, research centers, managers of ongoing projects (for example, PPCR). Part of the information was received directly from the participation in seminars and conferences organized by local and international organizations (for example, pre-conference forum "Women and Water: From words to actions" on June 19 and the High-Level International Conference in Dushanbe 20-22 June). In general, use of both the desk (secondary) and qualitative semi-structural interview of research methods created a condition for triangulation in obtaining reliable information.

4. OVERVIEW OF MARGINALIZED AND VULNERABLE GROUPS

In the context of proposed project, marginalized and vulnerable groups in project area of Kafernigan river basin can be considered first of all (i) population groups or communities that live in places with increased impacts of climate change. The same applies to those groups who have land plots/agricultural lands in areas potentially vulnerable to impacts of climate change. Furthermore, marginalized and vulnerable groups include (ii) poor and food insecure households (households with incomes below poverty line), households with limited or no productive assets (livestock, agricultural land plots), (iii) female headed households, (iv) households with majority children and elderly members, (v) households with handicap members/individuals, and (vi) households without manpower due to relatively higher rates of labor outmigration among men (to Russian Federation and elsewhere).

Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project implementation. For this purpose, UNDP has compiled statistical data on the abovementioned groups with support from local district hukumats. Reportedly, district authorities maintain regular updates of vulnerable and marginalized population disaggregated by communities (villages). When needed, during project implementation, authorities will provide detailed information to UNDP for the purposes of sub-projects design and prioritization to ensure inclusiveness and equity among project beneficiaries.

The **Table 1** below provides a summary of marginalized and vulnerable population residing in target districts of Kafernigan River Basin.

Table 1. Overview of marginalized and vulnerable population in target districts of KRB

#	Data item	Target districts in Kafernigan River Basin					
		Vahdat	Fayzabad	Varzob	N. Khisrav	Qabodiyon	Shaartuz
1	# of households with handicap members	3900	1245	1290	440	1863	1300
	In % to total number of households	10.2%	9%	12.1%	6%	8.2%	7.3%
2	# of households below poverty line	10707	4600	3286	2368	6557	5323
	In % to total number of households	28%	35%	31%	32%	29%	30%
3	# of food-insecure households	7265	2500	2226	1628	4296	4400
	In % to total number of households	19%	23%	21%	22%	19%	24%
4	# of female-headed households	7648	2450	1696	740	2034	1952
	In % to total number of households	20%	15%	16%	10%	9%	11%
5	# of households with majority children and elderly	17972	6125	5406	3552	11531	9405

	In % to total number of households	47%	50%	51%	48%	51%	53%
6	# of households without manpower	12000	4000	1700	2100	9000	3200
	In % to total number of households	31.3%	33%	17%	28.3%	40%	18%

As part of the project proposal, UNDP has developed a Stakeholder Engagement Plan which will guide consultations inclusively during implementation phases, assuring broad representation within existing relevant community based organizations and groups. Such organizations and groups have been consulted during stakeholder consultation missions and include farming associations and cooperatives, women’s committees, intervention related initiative groups, pasture development associations, water users associations, forestry cooperatives and communal health promoters.

As part of the given Stakeholder Engagement Plan the project will regularly monitor and assess (during Inception Phase, on a quarterly basis) the extent of involvement of marginalized and vulnerable within such organizations and groups. Community mobilization specialists appointed jointly by the UNDP and district authorities will organize focused consultations with such groups to design sub-projects tailor-made and suitable for vulnerable and marginalized households.

Preliminary discussions with district and community authorities, as well as with relevant stakeholders during consultation missions revealed that among targeted sub-projects that may be prioritized and suitable for vulnerable groups may include:

- on-farm adaptation interventions.
- household plots productivity measures.
- selection of demonstration plots with farmer field school support.
- Certain enterprise development and income generating activities (a) bee keeping, (b) fodder/animal feed production, (c) livestock productivity support, (d) high-value crops production (vegetables and fruits), and (e) small-scale poultry farming, and etc.

The following section provides information with regards to vulnerable communities situated within or nearby areas severely impacted by hazardous climatic events.

5. COMMUNITIES VULNERABLE TO HAZARDOUS CLIMATIC EVENTS

In each of the selected project target districts of Kafernigan River Basin, UNDP jointly with District Authorities have identified communities that are located within areas vulnerable to hazardous climatic events. Further below, for each districts, tables (as available) indicate number of households/population living in hazardous or potentially hazardous sites, as well as types of climate induced hazards occurred in the past and that are potentially recurrent in nature.

5.1. VULNERABLE COMMUNITIES IN FAYZABAD DISTRICT – UPSTREAM OF KRB

Fayzabad district is located in the eastern part of the republic. The area of Fayzabad district is 874.1 square kilometers, the total population is 97531 people. There are hazardous areas in jamoats of Buston, Mehrobod, Vashgird, D. Aliyev, Javonon, Kalai Dasht, Miskinobod and Chashmasor. In 26 existing villages there is a threat of occurring of mudflows and landslides. To ensure the safety of the population, it is necessary to organize bank protection works. In total, 1056 households or 6559 people live in those hazardous areas. The main sources of the threat of natural disasters are mudflows and floods on the Surkhdara river in D. Aliyev Jamoat and Elok river in Kalai Dasht, Chashmasor, Chavonon, Buston, Mehrobod and Vashgird Jamoats.

Table 2. Communities located within areas vulnerable to hazardous climatic events – Fayzabad district of upstream KRB.

Villages / Communities	Households	Population	Hazardous climatic events	Geological conclusion
Jamoat Buston				
Haymahmadi	15	91	Mudflows, floods	Yes
Jamoat Mehrobod				
Yakkabed	15	132	Landslides	Yes
Fayzov	14	117	Landslides	Yes
Shukuri	15	121	Landslides	Yes
Kasamdara	2	11	Landslides	Yes
Ustoshams	14	138	Floods	Yes
Somoniyon	12	108	Floods	Yes
Mehrobodi bolo	12	106	Floods	Yes
Khaytak	15	48	Landslides	Yes
Jamoat Vashgird				
Shahtakiyon	14	125	Mudflows	No
Karamaydon	2	11	Landslides	No
Jamoat D. Aliev				
Surkhdara	8	15	Mudflows	No
Boghi Miri	150	1050	Mudflows	No
Fayzobod	60	420	Mudflows	No
Jonvarsuz	12	84	Mudflows	No
Jamoat Javonon				
Sari Chashma	14	98	Mudflows	No

Arzanov	12	84	Mudflows	No
Chanoro	18	108	Landslides	No
Khami Savra	5	32	Mudflows	No
Javonon	11	67	Mudflows	No
Dova	23	139	Landslides	No
Khami seb	6	41	Landslides	No
Obi Sangbur	13	82	Mudflows	No
Jamoat Chashmasor				
Ghulomdavlat	56	498	Landslides	No
Kulobiyon	52	353	Landslides	No
Sari Safedkhok	6	38	Landslides	No
Jamoat Qalai Dasht				
Dashti Marzo	120	700	Landslides	Yes
Elok	250	800	Mudflows	Yes
Ochildi	40	280	Rockfalls	Yes
Jamoat Miskinobod				
Saroy	3	21	Mudflows	Yes
Fakirobod	2	13	Mudflows	Yes
Gulteppa	5	30	Mudflows	Yes
Fahhobod	11	102	Mudflows	Yes
Zarkamar 1-2	27	270	Mudflows	Yes
Orifon	3	18	Mudflows	Yes
Muminobod	11	92	Mudflows	Yes
Jamoat Fayzabad (urban type)				
Roziqzoda	10	54	Mudflows	Yes
Chinai	13	62	Mudflows	Yes
Total in Fayzabad district	1056	6559		

The main problems in reducing the risk of natural disasters are the lack of funds in the budget for the early warning system, risk reduction activities, response to natural disasters and for taking measures to protect the population in the most vulnerable parts of the district. Inefficient civil defense services, lack of risk maps, lack of equipment and mechanisms for the prevention of natural disasters also the issue in this district.

5.2. VULNERABLE COMMUNITIES IN VARZOB DISTRICT – UPSTREAM OF KRB

There are dangerous areas in all rural Jamoats of the district. Out the 70 existing villages in the district, 22 are prone to natural disasters, which is 31.4% of the settlements. Out the total number of households in the district, 414 households or 4% are located in hazardous areas. A total of 2152 people or 2.7% of the population live in disaster prone areas.

Table 3. Number of communities located within areas vulnerable to hazardous climatic events – Varzob district of upstream KRB.

#	Jamoats	Total # of villages	Villages in hazardous sites	Villages in hazardous sites (in %)
1	Luchob	9	4	44,4
2	Chorbogh	15	6	40
3	S. Aini	16	3	18,7

4	Varzob Qal'a	12	3	25
5	Dehmalik	11	3	27
6	Zideh	7	2	28,5
	Total	70	22	31,4
#	Jamoats	Total # of households	Households in hazardous sites	Households in hazardous sites (in %)
1	Luchob	893	83	9,3
2	Chorbogh	3745	126	3,4
3	S. Aini	1989	46	2,3
4	Varzob Qal'a	1494	48	3,2
5	Dehmalik	1123	60	5,3
6	Zideh	978	51	5,2
	Total	10222	414	4
#	Jamoats	Total Population	Population in hazardous sites	Population in hazardous sites (in %)
1	Luchob	7063	420	5,9
2	Chorbogh	28782	639	2,2
3	S. Aini	14052	258	1,8
4	Varzob Qal'a	11438	222	1,9
5	Dehmalik	7882	359	4,5
6	Zideh	7085	254	3,6
	Total	76302	2152	2.82

The entire territory of the region is prone to natural disasters, such as prolonged rains, mudflows, rockfalls, landslides and avalanches.

Table 4. Major hazardous events and vulnerable communities - Varzob district of upstream KRB.

Jamoats	Villages / Communities	Hazardous climatic events
Chorbogh	Sarikutal	Landslides, mudflows, floods
	Dahana	Landslides, mudflows, floods
	Arakchin	Landslides
	Kulihavoi	Landslides
	Yakachuguz	Landslides, floods
	Darai foni	Landslides, floods
Luchob	Alkhuch	Landslides, floods
	Kosataroshi Bolo	Landslides, floods
	Luchob	Mudflows, floods
	Sayod	Landslides, floods
S. Aini	Bakavul	Landslides, floods
	Shaykhak	Landslides, floods
	Kharangoni bolo	Landslides
Varzob Qal'a	Begar	Mudflows, floods, landslides
	Varzob Kala	Mudflows, floods, avalanches, rockfalls
	Fanforak	Landslide, floods, prolonged winter
Zideh	Hazora	Avalanches, landslides, floods
	Kalon	Avalanches, landslides, floods
Dehmalik	Begar	Mudflows, floods, landslides
	Varzob Kala	Mudflows, floods, landslides, rockfalls

Fanforak	Landslide, floods, prolonged winter
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The main problems in reducing the risk of natural disasters are the lack of funds in the budget for the early warning system, risk reduction activities, response to natural disasters and for taking measures to protect the population in the most vulnerable parts of the district. Inefficient civil defense services, lack of risk maps, lack of equipment and mechanisms for the prevention of natural disasters also the issue in this district.

Lack of a warehouse for storage of material stocks for prevention and elimination of emergencies, lack of a vehicle for timely delivery of the emergency commission members of the district to the accident site or natural disaster affected area, lack of early warning system for the population when there is a threat and an emergency situation, lack of a rescue team with all technical means necessary for rescue operations.

5.3. VULNERABLE COMMUNITIES IN VAHDAT DISTRICT – UPSTREAM OF KRB

In Vahdat Jamoats and settlements, mainly natural and man-made disasters are recorded. Natural disasters, floods, mudslides, earthquakes, avalanches, mudslides, severe winds, epidemics, and droughts.

Fore prevention of emergency situations in disaster prone areas, tree planting, bank protection works, prevention of unauthorized construction of hazardous areas, conducting geological survey, conducting explanatory campaigns, training on civil defense, planning and relocation of people from disaster prone area to safe places are needed.

Local population should be actively involved in reducing disaster risk reduction activities. A detailed analysis of the population's needs, including assessment of their poverty level, identifies factors that affect the vulnerability of the population and measures to improve the situation for the development of single action plans in case of emergencies.

Table 5. Communities located within areas vulnerable to hazardous climatic events – Vahdat district of upstream KRB.

Jamoats	Villages / Communities	Hazardous climatic events
District centre	Chutkaisha village	Mudflow
Jamoat N. Roziq (urban type)	Sarichashma village	Mudflow
	N.Rozik village	Landslide
Jamoat A. Abdulvosiev	Zulfi village	Mudflow
	Shabgardi village	Mudflow
	Obidarai dahana village	Mudflow
	Obidarai Chungak village	Mudflow
	Kofarnihon village	Mudflow
	Dashdibedi Kalon village	Mudflow
	Sufiyon village	Mudflow
	Mehrgon village	Landslide
	Maidon village	Landslide
	Kul village	Mudflow
	Obi Nukra village	Mudflow
	Eloval village	Mudflow
Jamoat Bahor	Lolazor village	Landslide

	Tundra village	Landslide
	Pistamazor village	Mudflow
	Chashmasor village	Mudflow
	Gulbogh village	Mudflow
	Hojikataghan village	Mudflow
	Kamongaron village	Mudflow
Jamoat B. Burunov	Kholmurodi village	Landslide
	Javoni village	Landslide
	Sarichashma village	Landslide
	Mehrobod village	Landslide
Jamoat Guliston	Okjari Uzbek village	Mudflow
	Okjari Lakai village	Mudflow
	Baldurghon village	Mudflow
	Anjir village	Landslide
	Jangalobod 1 village	Mudflow
	Jangalobod 2 village	Mudflow
	Jangalobod 3 village	Mudflow
	Khirgatarosh village	Landslide
	Khairobod village	Mudflow
Jamoat Juyangaron	Amonshaikhi village	Mudflow
	Lijak village	Mudflow
	Chuyangaron village	Mudflow
	Shorazm village	Landslide
	Sebzor village	Landslide
Jamoat Romit	Loshkharf village	Landslide
	Vistan village	Mudflow
	Yafrak village	Mudflow
	Romit village	Mudflow
	Sayod village	Mudflow
	Sorvo village	Mudflow
	Dehpir village	Mudflow
Jamoat Chorsu	Ghushi village	Landslide
	Gulakandoz village	Landslide
	Choraza village	Landslide
	Pustkhur village	Landslide
	Chepisoleh village	Landslide
	Yalanchinor village	Landslide
Jamoat K. Ismoilov	Buston village	Mudflow
	Navobodi Poyon village	Mudflow
	Muminobod village	Mudflow
	Vahdatobod village	Mudflow
	Gurgkhurda village	Mudflow
	Shuri Poyon village	Mudflow
	Dashti shur village	Mudflow
Jamoat Simiganj	Sarichinor village	Mudflow
	Kahlon village	Mudflow
	Tangai village	Mudflow
	Kushvo village	Mudflow
	Yums village	Mudflow

	Kipchok village	Landslide
	Nozirobod village	Mudflow
	Bakaron village	Mudflow
	Kashangi village	Mudflow
	Shabgardiyon village	Mudflow
	Kaftarkhona village	Mudflow
	Simiganj village	Landslide
	Diyamon village	Landslide
	Haitali village	Landslide
Total	75 villages, 3237 households, 17191 persons	

Key challenges for mitigation of natural disasters are budget deficits and low efficiency in the prevention of natural disasters, including lack of clustering of the areas, which are under the influence of eco-geological process, to identify the most vulnerable areas in the urban and rural infrastructure planning process, lack of district risk maps, no technical evaluation of housing sector, limited funds for bank protection works, cleaning of flood canals, uncontrolled extraction of sand and gravel from rivers/flood canals, lack of funds for establishment of early warning system and population protection in disaster prone areas, inefficient civil defense services and no district risk maps.

Disaster risk mitigation needs include:

- Cleaning of flood canals
- River bank protection activities
- Relocation of people from disaster prone areas
- Training of population on civil defence
- Rehabilitation of civil defence infrastructure
- Trainings on civil protection
- Conducting preventive work against epidemics
- Restoration of anti-hail services
- Provision of specialized machinery

5.4. VULNERABLE COMMUNITIES IN QABODIYON DISTRICT – DOWNSTREAM OF KRB

There are hazardous territories in all jamoats of the region. Out of 44 villages, 19 villages are exposed to natural hazards, which is 34% of the settlements. The number of households directly located in hazardous areas is 1970 or 10% of all households in the district. In total, 151804 people live in disaster prone areas, which is 9% of the district’s population.

Table 6. Number of communities located within areas vulnerable to hazardous climatic events – Qabodiyon district of downstream KRB.

#	Jamoats	Total # of Villages	Villages in hazardous sites	Villages in hazardous sites (in %)
1	N. Khusrav	8	2	25
2	Khudoykulov	12	3	25
3	Qubodiyon	5	5	100
4	Nazarov	3	3	100
5	Niyozov	6	1	17
6	Yangiyul	7	3	43

7	Navobod	3	2	67
	Total	44	19	43
#	Jamoats	Total # of households	Households in hazardous sites	Households in hazardous sites (in %)
1	N. Khusrav	4545	450	10
2	Khudoykulov	4471	0	0
3	Qubodiyon	1414	70	5
4	Nazarov	2676	250	9
5	Niyozov	2498	450	18
6	Yangiyul	3565	150	4
7	Navobod	1135	600	53
	Total	20304	1970	10
#	Jamoats	Total # Population	Population in hazardous sites	Population in hazardous sites (in %)
1	N. Khusrav	32977	2177	7
2	Khudoykulov	38992	0	0
3	Qubodiyon	10357	1300	13
4	Nazarov	19205	1300	7
5	Niyozov	17353	2480	14
6	Yangiyul	23953	1170	5
7	Navobod	8967	5118	57
	Total	151804	13545	9

Table 7. Major hazardous events and vulnerable communities - Qabodiyon district of downstream KRB.

Jamoats	Villages	Hazardous climatic events
Nosiri Khisrav	Akhcha	Flood
	Jonazarteppa	Flood
S. Khudoykulov	Havaskor	Flood
	Kurort	Mudflow
	Chirik	Mudflow
Qubodiyon	Chingilish	Mudflow
	Chuponkishlok	Mudflow
	Zarkamar	Mudflow
	Boghijigida	Mudflow
	Rudakul	Mudflow
U. Nazarov	Boshkala	Flood
	Mehnatobod	Flood
	8 Marta	Flood
Niyozov	Ziraki	Flood
Yangiyul	Okhunboboev	Flood
	Beshtemur	Flood
	Sangoba	Flood

Disaster risk reduction should be considered as an integrated, intersectoral aspect that affects all infrastructure, since in the event of a disaster all sectors suffer. In this regard, the main goal is to integrate disaster risk reduction measures into the District Development Programmes through

implementation of plans for preparedness and response to natural disasters and emergencies and allocation of funds from all development budgets.

The local population must be actively involved in disaster risk reduction activities. It is necessary to carry out a detailed analysis of the population strata and analyze the extent of their poverty, determine the factors affecting the vulnerability of these segments of the population and measures to improve the situation by developing a single action plan in case of emergency.

Taking into account the significant material damage caused by natural disasters, it is necessary to develop a disaster risk reduction strategy, a plan of preventive measures with the participation of all the structures involved.

The main problems of the district in the area of disaster risk reduction:

- disaster warning / response;
- establishment of early warning system;
- protection of population in the most vulnerable areas;
- lack of effectiveness of the activities of the district civil defense services;
- no maps of dangerous areas;
- lack of bank protection activities.

5.5. VULNERABLE COMMUNITIES IN NOSIRI KHISRAV DISTRICT – DOWNSTREAM OF KRB

In 4 villages there are 3 types of hazardous processes. The main types of hazardous processes include the following: flooding, strong winds and earthquakes. In those villages 1,800 people live, which is 5.2% of the total population of the district. The entire territory of the district is subject to heavy snowfall and cold weather. The table below lists the threats for each village.

Table 8. Communities located within areas vulnerable to hazardous climatic events – Nosiri Khisrav district of downstream KRB

Jamoats	Villages	Hazardous climatic events	Number of vulnerable households	Vulnerable population
Firuza	Vahdat	Mudflows, strong winds	66	347
	Murodteppa	Mudflows, strong winds	285	12262
	Hojimamashukur	Mudflows, strong winds	50	278
	Orzu	Mudflows, strong winds	302	1145
Total			703	14032

In conditions of limited land resources and potential significant damage from natural disasters, it is extremely important to ensure the protection of crops and the agricultural sector from mudflows through the construction of appropriate protective structures, such as bank protection, construction and maintenance of flood diversion canals, collector-drainage networks.

Taking into account the fact that the district is subsidized and the funds of republican and regional subventions constitute more than 57%, at present there are no financial opportunities for mitigation work, and for these purposes it is necessary to provide financial resources.

The main problems associated with reducing the impact of natural disasters are lack of budgeted funds and low effectiveness of the natural disaster prevention system, including the lack of

classification of areas under the influence of geological exogenous processes to identify more vulnerable areas at the planning stage of the infrastructure of settlements and villages, lack of maps of dangerous areas of the district, inefficient emergency mitigation mechanisms, lack of technical assessment of the housing sector, lack of funds for bank protection and flood canal cleaning activities and uncontrolled extraction of gravel and sand from the riverbeds.

5.6. VULNERABLE COMMUNITIES IN SHAARTUZ DISTRICT – DOWNSTREAM OF KRB

For mitigation of natural disasters, population and farms, training of the population, preparedness of machinery for disaster response, assistance to disaster affected population, distribution of humanitarian aid to affected people, the district representation of the Committee of Emergency Situations conducts timely actions.

Out of 39 villages of the district, 11 are located in hazardous zones with the risk of flooding and mudflows. There are 8553 people living in hazardous zones, which is 6.9% of the total population of the area.

Table 9. Number of communities located within areas vulnerable to hazardous climatic events – Shaartuz district of downstream KRB.

#	Jamoats	Total # of Villages	Villages in hazardous sites
1	J. Nazarov	5	2
2	K. Kholmatov	15	5
3	Pakhtaobod	8	4
	Total	28	11
#	Jamoats	Total # of households	Households in hazardous sites
1	J. Nazarov	2667	1980
2	K. Kholmatov	5519	4120
3	Pakhtaobod	3682	2453
	Total	11868	8553
#	Jamoats	Total # Population	Population in hazardous sites
1	J. Nazarov	19830	2500
2	K. Kholmatov	36120	2020
3	Pakhtaobod	23942	1968
	Total	79892	6488

Table 10. Major hazardous events and vulnerable communities - Shaartuz district of downstream KRB.

#	Jamoats	Villages / Communities	Hazardous climatic events
1	Jamoat Shaartuz (urban type)	Istiqlol, Q. Khaitov	Floods
2	K. Kholmatov	Khokak	Floods
3	Pakhtaobod	Sultonobod, Yangiobod, Vahdat	Floods, mudflows
4	T. Sadridinov	Sayyod, L. Nurov	Floods
5	J. Nazarov	Lubuyokor, Jamiyat Dehqon	Floods

Key challenges for disaster risk reduction in the area:

- lack of material resources for disaster response;
- the deficit of financial resources;
- no early warning systems;
- lack of population protection measures in vulnerable areas of the district;
- limited effectiveness of the civil defence.

6. GENDER AND CLIMATE CHANGE IN TAJIKISTAN

Individuals and certain groups have different capabilities to cope with climate change and extreme weather event caused by climate change depends on their location and social status. For example, compared to men, women who work in agricultural fields and walk long distances to fetch water and firewood are more vulnerable to transmitted diseases and heat stroke. Due to their position in society women, children and elderly are more likely to face the brunt of extreme weather events such as flood, landslide and mudflows.

It is however important to also acknowledge that women hold an enormous potential and capacity to cope with the increasing risk of disasters caused by the climate change. Women are already at the frontline of climate change adaptation, given the increasing number of floods and droughts that affect their livelihoods. Women have a needed experience and knowledge to build the resilience of their communities to increasing natural threats as those who are leading development process concerning management of natural and environmental resources³³⁸.

Researches identify women as a vulnerable group exposed to the effects of climate change. Women are more vulnerable to reductions in dietary quality. Women more often experience anemia, the incidence of vascular diseases and obesity. Health and well-being of women are significant for the health and healthy development of their children, family, community and society. Especially vulnerable categories of women reported to be pregnant, having young children, caring for sick and elderly family members. Women spend most of their time to take care of their family such as providing basic living condition and food in prejudice of productive activities or participation in public life.

Due to their position in society women, children and elderly are more likely to face the burnt of extreme weather events such as flood, landslide and mudflows. Table 11 lists some of the gaps that need to be overcome to make the risks and impacts of climate change gender neutral in Tajikistan.

Table 11. Gender Sector Gaps by Capacity Levels³³⁹

Capacity level	Gaps
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³³⁸ Gender perspectives: integrating disaster risk reduction into climate change adaptation. Good Practices and Lessons Learned. UN. 2008

³³⁹ Source: Advisory Group on the Development of a Draft National Strategy for Adaptation to Climate Change.

Capacity level	Gaps
System level	<ol style="list-style-type: none"> 1. Low level of women's representation in all branches of government. 2. Social mores restrict women's decision-making rights, both at the household level and the farm level. 3. Social norms impede the attendance of women and the level of their participation in trainings, especially in groups where both sexes participate
Organizational level	<ol style="list-style-type: none"> 4. State women's organizations are not tasked with addressing climate-related issues. 5. Women's NGOs have a very low level of awareness about climate change and adaptation issues. 6. The organizations cannot understand the extent of climate threats to women, especially in rural areas.
Individual level	<ol style="list-style-type: none"> 7. Lack of awareness on climate change among women 8. Lack of decision-making power among women to take adaptation measures 9. Lack of information on preparing for extreme weather events and responding to these phenomena among women, including knowledge of evacuation rules and basic survival skills, such as swimming 10. Lack of opportunity to attend seminars and trainings on climate risk reduction and management

Therefore, the purpose of the assessment is to highlight initiatives in Tajikistan to reduce the vulnerability of the population to the impacts of climate change and climate disasters with attention to the needs and priorities of women and the further development of adaptation measures.

Main objectives of the analysis:

- Development of a tools and a plan for collecting information on the gender aspects with regards to climate change;
- Analysis of regulatory documents, programs and strategies related to the gender aspects of climate change;
- Review and analysis of studies conducted in Tajikistan on issues related to the impact of climate change on women and the most vulnerable segments of the population;
- Recommendation of specific research directions, to develop tools for integrating gender into development planning and policies, assessing vulnerabilities and developing adaptation strategies
- Development of a proposal for the adoption of adaptation measures to reduce the impact of climate change in terms of the gender aspects of climate change.

6.1. POLICY REVIEW – GENDER AND CLIMATE CHANGE

A number of legal and regulatory acts regarding gender aspect have been adopted in the Republic of Tajikistan such as Law of the Republic of Tajikistan *“On State Guarantees of Equal Rights of Men and Women and Equal Opportunities for Their Implementation”*, adopted on December 15, 2004, *Family Code of the Republic of Tajikistan on November 13, 1998*, Decree of the President of the Republic of Tajikistan *“On measures to improve the status of women in society”* December 1999, the State Program *“The main directions of state policy to ensure equal rights and opportunities for women and men in the Republic of Tajikistan for 2001-2010”*, the *National Strategy for Enhancing the Role of Women in the Republic of Tajikistan for 2011–2020*. Although

the adopted legal documents do not mention the gender aspects of climate change, they also address issues of adaptation measures aimed at reducing the impact of climate change.

Thus, the National Strategy for Enhancing the Role of Women in the Republic of Tajikistan for 2011–2020 proposes several adaptation measures, which also aim at reducing the impact of climate change on women. It is considered to create and develop women's organizations involved in women's economic advancement and their training in new specializations to overcome issues related to women's employment and their role in the labor market. The strategy proposes to design a program for the development of small family business, various forms of self-employment, creation of a system of "business incubators". Regarding climate change issues, it is proposed to develop criteria for assessing the impact of environmental factors and working conditions on women's health (including reproductive function).

A separate chapter is devoted to providing support to the development of female entrepreneurship. The aim in this direction is to achieve gender equality in financial resources, through lending, development of entrepreneurship among women. Due to high level of labor migration, most women are engaged in agriculture which is most exposed to the risks of climate change. Therefore, it is proposed to improve women's access to land, simplify women's access to loans, and train new skills in agricultural production also regarding climate change. The strategy proposes to work to improve the educational level of women, especially those living in rural and remote areas, as well as in low-income families³⁴⁰.

National Development Strategy of the Republic of Tajikistan for the period until 2030. Issues of gender equality and climate change in the NDS are discussed in Chapter 4, "Developing Human Capital". In the section it is noted that in terms of gender equality, Tajikistan has reached the level of middle-income countries. The section "Environment and Life" notes that pollution of the habitat, low level of ecosystem management, as well as poor biodiversity conservation, land degradation, and high level of vulnerability to climate change, access to clean water and sanitation are the main challenges facing the country.

The strategy notes that the main problems for Tajikistan in recent years have been a high level of risk of natural disasters, including due to climate change, from which, first, women and children suffer.

To create incentives for reduction impact of climate change considering gender aspects, it suggested to design and implement a nature protection code and mechanisms for adaptation to climate change with increased international cooperation in this area.

In developing of a disaster risk reduction management system related to climate change, it is proposed to integrate considered actions into the country's economic sector management system.

The Strategy notes the need to develop and implement mechanisms for reducing social vulnerability due to natural disasters, the formation and implementation of gender-sensitive system information support and training of the population in proactive protective and restorative actions on natural disasters. It is proposed to develop a system for implementing climate change

³⁴⁰ National strategy to enhance the role of women in the Republic of Tajikistan for 2011-2020. It is approved by the order of the Government of the Republic of Tajikistan from May 29, 2010 No. 269

issues, disaster prevention in strategic regional documents, and strengthening local disaster risk management capabilities.

In the draft National Strategy for Adaptation to Climate Change of Tajikistan until 2030³⁴¹ (NACC) gender issues are addressed in a cross-sectoral area. The draft of NACC project lists gaps that need to be overcome to ensure that the risks and impacts of climate change is gender neutral in Tajikistan. Capacity gaps are addressed in the Strategy from the point of view of the system, organizational and individual levels.

The Strategy highlights that the main gender gap in climate change, first, is the low level of women's access to information on climate change, lack of decision-making power to take adaptation measures. In the NACC gender-related organizations have provided several projects focusing on development and employment for women and families of migrants exposed to climate change.

6.2. ASSESSMENTS AND REVIEWS – IMPACT OF CLIMATE CHANGE ON WOMEN OF TAJIKISTAN

In 2016, the Asian Development Bank (ADB prepared an assessment “Country Gender Assessment for Tajikistan”) as part of the Regional Technical Assistance (RTA). The report examines such important gender issues as: women in power and leadership, participation in civil society, economic opportunities for women and men, gender dynamics within the households, health issues, gender-based violence, access to justice, employment in agriculture, access to the system education and health, energy, enterprise development and transportation.

The gender aspects of climate change are discussed in the report from the point of view of implementing ADB policies in project activities. The report considers gender issues of climate change in the context of women's activities in agricultural production, both at the level of small dekhkan farms, and at the level of household plots. The report notes that female-headed households are one of the poorest and "often have very limited opportunities to cope or recover from weather-related losses."³⁴²

Low level of education, lack of technical knowledge, as well as limited participation in decision making process affect women's ability to adapt to climate change.

The report notes that despite gender inequalities in agriculture, women have tremendous potential for adaptation to climate change. Household-oriented activities for women are crucial for raising their awareness of climate change adaptation. Nevertheless, it is important to act also at the local and national level to share best practices in “management of natural resources in adapting and mitigating the effects of farming” and to increase information on women's rights with needed support through investments, credits and technologies.

In 2011, Oxfam prepared the report “Climate Change: Beyond Bridging. Women, small farmers in Tajikistan”. This report draws on the experience and perspectives of women farmers included in the research sample on climate change issues in early 2011, based on a combination of structured group discussions, questionnaire responses and standardized interviews.

³⁴¹ Currently, the draft National Strategy for Adaptation to Climate Change in Tajikistan until 2030 is being approved by the Government of the Republic of Tajikistan

³⁴² Country Gender Assessment for Tajikistan. ADB. Page 66

Field studies were carried out with groups of women engaged in agriculture in three regions of the country, which represents close interdependence of climate-related realities and the consequences faced by rural women in Tajikistan. The study consists four main sections that analyze: (i) the context and background information on gender issues in connection with the experience of climate change in Tajikistan; (ii) what women and small farmers say, (iii) how small farmers can cope with these problems and what additional support they can provide in the future; (iv) conclusions and recommendations³⁴³.

As part of Technical Assistance Project (TA) by the Asian Development Bank (ADB)– “TA8090-TAJ: Capacity building for sustainability and adaptation to climate change in November 2015 and again in August 2017 by the public organization “Kiston” Foundation”. Sociological studies about the level of climate change awareness were conducted in the five most vulnerable to climate change pilot areas of Tajikistan³⁴⁴. The study was conducted in the Pendjikent district of Sughd region, Muminabad and Hamadoni of the Khatlon region, Darvaz-GBAO and Lyakhsh-RRS.

The sociological study was based on a quantitative survey method (questionnaire). Following information was collected as follows: a) household awareness of current climate change; b) level of their knowledge how to act in particular cases; c) current actions taken to combat changes; d) household readiness to respond to changes in the future; e) current use of communications to combat climate change. During both studies 375 respondents (75 respondents in each district) were interviewed, of whom 61% were men and 39% women.

The results of the study showed that women have a relatively large degree of vulnerability and exposure to external extremes (shocks). For example, women covered by the survey more than men, interrupted or even stopped sending any family members to schools, reduced preventive medical visits, borrowed more money and food from friends / family, financial institutions and individuals . At the same time, less family members were sent to work. Probably due to less decision-making power and / or limited access to economic resources, women sold less livestock as an adaptation measure.

Within this project, the local youth organization Ecological Youth Center developed Local Climate Change Adaptation Action Plans (LCCAAP) in the same pilot areas where the sociological study of the level of climate change awareness among the population was conducted (Penjikent, Muminabad, Hamadoni, Lyakhsh and Darvaz). The goal of developing LCCAAP was to support the development of a National Climate Change Adaptation Strategy at the national and local levels. During the study 10 LCCAAP were developed at the local level two for each pilot area). Household vulnerability to climate change and extreme weather events caused by climate change vary for different reasons: gender issues, contribution, legal structure, institutional access and efficiency, and availability of social assistance systems. For example, the adaptation potential of men and women can vary considerably due to differences in income, savings, and assets. The vulnerability assessment of rural jamoats in the development of the LCCAAP was carried out with a gender perspective.

In defining the most vulnerable villages, the gender aspects were considered such as exposure (temperature, precipitation, drought, floods, mudflows, etc.), sensitivity (productivity, diseases, households headed by women, profitability, etc.) and adaptation potential (access education and

³⁴³ Climate change: beyond women to overcome, small-scale farmers in Tajikistan from experiences on adapting to climate change. Community research Oxfam June 2011

³⁴⁴ Report on the level of awareness of climate change among the population in selected areas of the Republic of Tajikistan. Kuhiston Foundation. August 2017

health, irrigated land, finance, etc.). Adaptation measures from LCCAAP at the village level were developed considering gender-specific characteristics of exposure to climate change.

In September 2015, the report “Actualization of the relationship between gender and the environment in Tajikistan: a study of the basic situation”³⁴⁵ was prepared as part of Stage I-II of the UNDP – UNEP Initiative for Poverty in Tajikistan “Poverty and the Environment” (PEI). This analysis is the first comprehensive study that addresses a wide range of actualization aspects and promotion of the relationship between gender and the environment.

Section IV of this report is devoted to the relationship between factors of gender, the environment and climate change in Tajikistan. This section contains information derived mainly from a review of available documents. It is also completed with additional information from semi-structures interviews with representatives of state authorities, civil society and the media in the regions of Gonchi, J. Rasulov and Isfara, located in the Sughd region. Also this section examines the gender aspects of water access and water management, electricity, gender aspects of disaster risks and their management in relation to climate change issues.

In the 2012 National Human Development Report “Tajikistan: Poverty in the Context of Climate Change”³⁴⁶ chapter 3 “Social aspects of the effects of climate change in Tajikistan” consist information about the possible impact of climate change on social-ecological processes with a gender perspective. This chapter examines possible impacts, identifies the main risks that lead to negative social phenomena (deterioration of access to drinking water, increased frequency of natural disasters and energy poverty, deterioration of health and education). The recommendations of the chapter indicate the main areas where urgent actions in development of adaptation and mitigation measures are needed, as well as consolidation and integration of various agencies with regards to assessments and adaptation. Despite the obvious linkages between climate change, disaster risk reduction and gender approaches to development, it is necessary to raise awareness of this close relationship.

In 2016, the Food and Agriculture Organization of the United Nations (FAO) prepared a country assessment “National Gender Profile of Agriculture and Rural Households of Tajikistan”. This document is part of the project “Strengthening National Capacities for the Production and Analysis of Data Disaggregated by Gender in accordance with the FAO Gender Statistics System in Agriculture (GSSA).

Although the national gender profile is not directly related to the gender aspects of climate change, the statistical information for the set of 18 basic gender indicators in agriculture and rural areas that were developed by the “FAO Regional Office for Eastern Europe and Central Asia” are very useful for determining vulnerability and the potential for climate change from a gender perspective. Analysis of data on women's access to education, health, housing, energy, safe drinking water and sanitation, transport system is crucial in terms of vulnerability to climate change in the national gender profile in agriculture³⁴⁷.

In November 2014, the Center for Sociological Research “Zerkalo” prepared a report “Gender assessment of humanitarian situations”. The report was based on the sociological survey conducted in communities affected by natural disasters in 2014. The overall goal of the study is to conduct a

³⁴⁵ UNDP - UNEP. Updating Gender-Environment Relations in Tajikistan: A Study of the Baseline Situation. Genreta Martonakova, Zumrad Kataeva, September 2015

³⁴⁶ National Human Development Report. "Tajikistan: Poverty in the Context of Climate Change." Dushanbe 2012. Pp. 80

³⁴⁷ National Gender Profile of Agriculture and Rural Households - Tajikistan. Food and Agriculture Organization of the United Nations. Ankara, 2016.

gender assessment of humanitarian situations and disaster response in Tajikistan to analyze aspects in the context of natural disasters that occurred in April-May 2014 in Tajikistan.

The survey was conducted in areas hit by flooding in April-May 2014 namely in Direct Rule Districts (DRD), Sughd and Khatlon regions. The study set the following task to reach the goal of the survey: to understand in more detail the situation in communities affected by natural disasters in April-May 2014; assess whether specific gender needs and vulnerabilities are taken into account; identify and understand the main risks, causes and factors associated with the increase in gender-based violence; identify risks associated with access to jobs, income and livelihood opportunities for women and other at-risk groups in affected communities; use the results of the assessment as a resource for developing recommendations that could be directed to the development of specific measures and actions for disaster mitigation, disaster prevention and response, taking into account a gender approach.

Assessment of gender aspects of climate change in projects PPCR. In recent years several initiatives, investments and technical assistance have been undertaken in Tajikistan with the support of the Climate Investment Fund (CIF), among them the Pilot Program for Climate Resilience (PPCR), the purpose of which was to lay the foundations for developing climate resilience and national planning in this domain. Gender assessment of climate change was included in the development of the Strategic Program for Adaptation to Climate Change (SPCRF) in October 2010.

The Strategic Program notes that even though women are experienced and knowledgeable in caring for their families and homes, they are most affected by unstable climatic conditions and experience social, economic and political barriers that impede their adaptive capacity. Gender concerns were included in the development of investments for initiatives on sustainable land and river basin management; the disaggregation by gender will be included in monitoring and evaluation systems³⁴⁸.

The program considers the specific women's vulnerabilities to climate risks, as well as possible transformations leading to a decrease it. A gender assessment of the use of energy and water among women and men has been carried out, and gender considerations have been included in the Pilot Program for Adaptation to Climate Change.

One of the components of climate change adaptation programs is monitoring the progress of activities on Phase 2 of the Pilot Program for adaptation to climate change within a single unified reporting system. In accordance with the procedure of the Climate Investment Fund (CIF), each pilot country must annually submit before June 30 to the CIF Administration information on progress at the national level and at the project / program level. Monitoring the gender aspects of climate change is included in Core Indicator 2, Evidence of Strengthened Capacity and Government Coordination Mechanisms for Implementing Resilience to Climate Change. The indicator takes into account the participation of women and men in the coordination mechanism of PPCR projects. The monitoring of key indicators at PPCR project levels also considers the needs of both women and men in the design and implementation of project components. PPCR projects provide mandatory information on the number of beneficiaries benefiting from the project, both among men and women.

Gender aspect of climate change in the National Communications of the Republic of Tajikistan on the UN Framework Convention on Climate Change. So far, Tajikistan has

³⁴⁸ Strategic Program for Climate Resilience (SPIC). Prepared under the Pilot Program for Climate Resilience (PPCR). October, 2010 Dushanbe, Tajikistan

prepared three National Communications of the Republic of Tajikistan under the UN Framework Convention on Climate Change. The first National Communication was prepared in 2002, the second in 2008, and the third in 2014. The process of preparing the fourth National Communication is currently underway.

The first National Communication partially tackle gender aspects of climate change in the section related to the impact of climate on public health.

In the second National Communication, gender aspects of climate change were considered in more detail in assessments of women's reproductive health vulnerability to climate change. The attention in this report was given to importance of raising the level of education and awareness related to climate change issues, especially of pregnant women. Considering that the number of pathological pregnancies and deliveries may increase for women living in hot climates, it is advisable to consider the creation of a specialized center for conducting qualified monitoring of the state of mothers and children in a changing climate.

There were no specific section on gender aspects at the first and second National Communications of the Republic of Tajikistan under the UN Framework convention on Climate Change, nevertheless, it appeared at the third National Report as a section "Gender, Reproductive Health and Climate Change". This section has been created mainly due to high interest in the negotiations of the UNFCCC to gender equality and opportunities in changing climate. Without the active participation of women, risk reduction and climate change strategies cannot succeed. Therefore, the texts of the relevant documents of the negotiation process reflect issues of gender equality in adaptation, mitigation, technology transfer, etc.

During the preparation of the Third National Communication report, the specific features of the course of a pregnancy, childbirth process and perinatal outcomes under the influence of climate changes and anomalies were investigated, and measures to improve reproductive health were developed. Based on the analysis of 19 thousand units of the actual material of the course of pregnancy, childbirth and clinical and laboratory studies, the features of the course of pregnancy and childbirth were identified, taking into account climatic changes and factors; studied the state of the fetus and perinatal outcomes in pregnant women; the influence of extreme climatic events on the gestational process and perinatal outcomes was determined; set threshold temperature; a set of adaptation measures has been developed for the management of pregnant women taking into account climate change.

6.3. GENDER ASPECTS OF LAND RESOURCE USE AND MANAGEMENT

Land degradation is a major environmental problem related to land use in Tajikistan. The main causes of land degradation and soil erosion are inadequate land management practices, poor water management and irrigation practices, overgrazing and deforestation. The situation is exacerbated by the effects of climate change.

Land degradation is directly related to food security, income from agricultural production and health problems, which primarily affect the poor. The above factors have an impact on both women and men. However, in addition to the above, the situation among women is also affected by limited access to land ownership.

In Tajikistan, access to land has a specific legal meaning. There is no private ownership of land, but people have the right to use land based on land use. The "ownership" of land means the rights to use the land, which are vested in persons whose names are mentioned in land certificates and licenses.

Usually rural households have small plots or gardens close to home and may also have access to other types of land: independent farmland (dekhkan farms) or presidential land (land that was transferred to rural households through presidential decrees, to increase the size of garden plots, which were less than the national minimum).

Even though significant gender-sensitive reform of the Land Code was carried out and efforts are being made to increase women's access to land, in practice land certificates are traditionally most often registered only in the name of a male head of household.

Land relations are regulated by the Land Code of the Republic of Tajikistan, adopted in 1996, which aims to create conditions for the rational use and protection of land, the reproduction of soil fertility, the preservation and improvement of the natural environment, for the equal development of all forms of economic management. In 2012, changes were made to it, including the paragraph on ensuring equal access of women and men to land plots³⁴⁹.

While most agricultural workers are women (75%), the number of women-headed dekhkan farms is significantly lower compared to men.

Table 12. Gender Aspects of Access to Land Resources in Tajikistan³⁵⁰

Years	Number of dekhkan farms	Share of dekhkan farms headed (%)	
		Men	Women
2010	37958	88,8	11,2
2011	57372	89,4	10,6
2012	58313	89,7	10,3
2013	73806	92,2	7,8
2014	87594	98,0	8,0
2015	108035	87,0	13,0

According to official statistics, in 2015, 13% of dekhkan farms were headed by women. It is noteworthy that over the past five years (2010-2014), the trend has been negative³⁵¹. Moreover, usually women head dekhkan small farms, where the number of participants does not exceed 10 people. This automatically results in lower crop rates. In 2015, out of all land plots for growing crops in dekhkan farms, only 6.4% were managed by women and the average sown area was 2.31 hectares, while the same indicator for male-headed farms was equal to 5.41 ha.

Furthermore, information about women, who de facto managers of agricultural production due to the absence of a man because labor migration is not recorded in official statistics. Typically, a man remains the legitimate head of dekhkan farm, even if he is absent from the country and a woman is mainly involved in day-to-day farm management. The lack of legal recognition of the role of women in the management of the economy limits the ability of women farmers to control resources. In addition, limited information about the work done by women in managing small farms or their contribution to housekeeping complicates political decision-making.

³⁴⁹ Land Code of the Republic of Tajikistan.

³⁵⁰ Gender indicators of production activity of dekhkan farms for 2010-2015 Agency for Statistics under the President of the Republic of Tajikistan.

³⁵¹ According to information received from the Committee for Land Resources Management and Geodesy of the Republic of Tajikistan in 2018, there were 180 thousand dekhkan farms in Tajikistan, of which more than 30 thousand farms are women (16.7%).

The main barriers and obstacles to the sustainable development of women's dekhkan farms are lack of financial resources, limited access to loans, lack of equipment, water shortages and other ameliorative and irrigation problems, the problem of providing fertilizers / pesticides, seed shortages and their low quality, as well as lack of knowledge and awareness. At the same time, farms headed by women work no worse than men, and in many cases they do better. Official statistics record higher rates of dekhkan farms, in which the leaders are women, on the yields of raw cotton, potatoes, grapes, etc.

6.4. GENDER ASPECTS OF NATURAL DISASTERS RISKS MANAGEMENT AND MITIGATION

Considering that more than half of the country's territory is covered by mountains of over 3000 meters above sea level, Tajikistan is particularly vulnerable to natural disasters, such as earthquakes, landslides, floods, avalanches and extreme climatic conditions. 20-30% of the territory of the mountain slopes of Tajikistan are prone to landslides. At present, more than 50,000 places of potential landslide have been registered, 1,200 of which threaten settlements, roads, irrigation and other facilities.

In addition to purely natural factors, including climate change impacts, exposure to natural disasters increases significantly due to the results of human activity, such as deforestation. The vulnerability of the population to the natural disasters is further increased due to poor local planning (settlements and industrial infrastructure are located in places vulnerable to natural disasters).

Natural disasters affect the lives, health and well-being of the population, as well as economic development at the national and household levels. According to the Committee of Emergencies and Civil Defense under the Government of Tajikistan from 1997 to 2018 Tajikistan experienced approximately 3,460 disasters. It should be noted that 80% of natural disasters in Tajikistan are water related. Over the past 22 years, 1,486 natural disasters associated with the mudflow occurred in the country and 572 cases of flooding, landslide and rockfalls. Tajikistan, as a mountainous country, is also subject to earthquakes (483 cases).

Climate change projections indicate that precipitation in Tajikistan will increase. This could lead to more climate-related hazards such as flood, mudflow and avalanches. Drought also may pose an increased risk for non-irrigated crops during the normal Spring-to-Fall wet season.

A recent study to assess the gender aspects of the humanitarian situation³⁵² in Tajikistan revealed that single women, who are head of households and elderly people are most vulnerable during the flood, as they are likely to remain in their homes, saving their belongings and children on their own or sometimes with the support of neighbors. Women who are heads of household are in the most vulnerable situation because all actions associated with saving their family members and property fall on their shoulders.

The same study also shows that men and women also take part in various public work on the rescue and recovery immediately after the flood. While men are usually involved in finding missing people and restoring destroyed buildings, women are highly active in delivering food, placing people in camps, providing medical care and caring for the elderly and children.

In February 2017, the World Bank as part of a project to reduce the impact of natural disasters in GBAO and Khatlon region, conducted assessment of strengthening critical infrastructure from

³⁵² Research Center "Zerkalo" "The gender assessment of the humanitarian situation", 2014

natural disasters³⁵³. The results of surveys in focus groups revealed that natural disasters have tangible impacts on all segments of the population.

But at the same time, respondents attributed the most vulnerable groups of the population to the impacts of natural disasters: a family where the heads of the household are women (mostly widows), a family where adult members of the household are mostly men in labor migration, a family without adult sons, large families, a family with a disabled member.

6.5. GENDER ASPECTS OF WATER RESOURCES MANAGEMENT

At the pre-conference forum “Women and Water: From words to actions” on June 19, on the eve of the high-level International Conference in Dushanbe on June 20-22, Ms. Pratibha Mehta, UN Resident Coordinator in Tajikistan stressed³⁵⁴: “Gender equality and access to water and sanitation facilities are inextricably linked. Globally, women and girls are the primary water collectors and, on an average, have to walk for about 3 hours per day to haul enough water for drinking, cooking, washing and basic hygiene for a family of 5- 6 persons. The daily burden and time spent in collecting water denies women the opportunity to earn a living or to fulfill their potential in professional arena and engage in more productive work. Moreover, carrying heavy pots of water on their hips, back or on their head affects women physically, including in pelvic deformities which can result in child birth problems. It is imperative to involve women in the financing and planning of water supply and sewage systems, as well as in finding solutions to ease the burden of daily care and facilitate the provision of gender-sensitive services”.

Aliya El-Yassir, and. UN-Women Regional Director for Europe and Central Asia noted: “We need to recognize women as equal stakeholders in water management. The representation of women in various organizations, their knowledge and participation in decision-making processes are crucial to ensure that everyone has access to clean, safe and affordable water and sanitation for sustainable development”.

It is crucial to take into account and adequately assess the skills, knowledge and contribution of women in managing water resources. The incentives given by the International Decade for Action “Water for Sustainable Development” gives the opportunity to prioritize water and sanitation as integral elements of sustainable development, and women as the key driving force for change all processes related to providing access and effective management.

More than two thirds of Tajikistan’s rural population have access to improved (safe) drinking water sources (71% of rural households). The majority (30%) of these households use public water mains or columns in the street, followed by the use of water from water mains in residential premises. Of the 28% of rural households that use unimproved water sources, use water from unprotected wells or springs and surface waters (19%) or water delivered by tankers (6%)³⁵⁵.

As in the case of energy supply restrictions, it is women who experience discomfort due to lack of water, as they use water primarily for household needs (cooking, cleaning, washing and bathing children) and spend a lot of time collecting water when it is not delivered to the house by the plumbing system. The lack of sanitary and hygienic conditions (as well as clean water for washing hands) leads to the risk of developing gastrointestinal diseases and the transmission of other diseases among family members. Any family member may become infected, but children and the elderly are at the high risk. Given the traditional responsibility of women for the taking care of sick

³⁵³ The World Bank. The report "Strengthening critical infrastructure from natural disasters." February 2017

³⁵⁴ The UN Resident Coordinator and UNDP Resident Representative in Tajikistan

³⁵⁵ Healthcare in the Republic of Tajikistan 2015. Agency for Statistics under the President of the Republic of Tajikistan.

family members, poor sanitary conditions also contribute to increasing the burden for women to care for family members.

Women focus on water quality and the protection of water sources, which indicates that women are integral part of decision-making process related to sustainable water management. But, despite the activeness of women, their level of representation in government bodies is not high. This is explained not only by the current state of land and water use, but also by the low level of awareness and knowledge of women of their rights.

Lack of access to land is often a fundamental cause of women's limited access to water. Thus, land reforms that distribute the right of land tenure among heads of farms or permanent agricultural workers (who are mostly men), result in women having fewer real rights to water, even though at the legislative level there is equal. Even if women have a legitimate right to land, traditions often impede their real control over the land and water resources, which are essential economic capital for further development, access to which determines the ability to participate in decision-making processes.

Although the percentage of women working in agriculture is higher than men, decision-making positions are mostly held by men, especially in the cotton sector, which is responsible for more than 50% of irrigated land. Women are represented in small personal plots, while men operate large plots, although women work constantly in the field. If we talk about women occupying senior positions in various ranks in the system of basin management of water management, then there are even fewer - about 1%³⁵⁶.

For rural women, the Water Users Association of Tajikistan (WUA) is one of the most important social assets, since they regulate the use of water for irrigation. Traditionally, irrigation water control is the “male” field of activity, and women are responsible for managing domestic water. Women, as a rule, do not actively participate in WUAs, even in regions with high levels of male migration and despite the significant role that women play in agriculture, including on farms and gardens. The absence of men in many rural areas, the increase in the number of female-headed households, and the “traditional and religious separation of women from other non-relatives” has created a situation in which women have to take a more active role in water management unofficially.

6.6. GENDER ASPECTS OF PASTURE AND FOREST RESOURCES MANAGEMENT

Access to pasture management. Specific methods of livestock breeding in Tajikistan create an additional obstacle for pasture resources. Under the Soviet system, livestock production largely depended on the use of mixed forage grown on large state farms. Today, livestock owned by small farms has increased significantly, but forage is a scarce product or too expensive, and farmers rely on pastures, which led to "intensive, year-round overgrazing on traditional spring and autumn pastures."

According to the Land Code, pastures may be registered to individuals for long-term or permanent use, resulting ownership of some pastures to personal subsidiary farms, while “most animals remained in families that do not have formal access to pasture land lands. ” The Law on Pastures 2013 has created a system of pasture user associations (PUA), but exclusive property rights often lead to conflicts of interest. Dekhkan farms or other agricultural enterprises may merge into PUA.

³⁵⁶ National Review of the RT on the implementation of the Beijing Declaration and Platform for Action (1995) and the outcome documents of the twenty-third special session of the General Assembly (2000) in the context of the twentieth anniversary of the Fourth World Conference on Women and the adoption of the Beijing Declaration and Platform for Action in 2015. Page 44.

By some estimates, up to 80 percent of pastures are under a threat of degradation and erosion, which causes high demand and competition in pasture management. While several projects in Tajikistan are developing livestock production and improving pasture management, taking into account the special needs of women farmers, experts emphasize that "a specific analysis of changing gender roles in pasture management and improvements in the status of women has not been done yet." One of the most important and omitted issues for women is limited recognition of their role in animal husbandry, or methods of gender distribution roles. Since women have a limited access to land, they are even more limited in access to pastures.

Access to forestry. Tajikistan is a mountainous country, and forests occupy just over three percent of the total territory. A significant part of the population lives either inside or nearby the forest, but forest lands are under a serious threat. It is estimated that in the past century, forest land was reduced by 75% (and this process has accelerated in the last decade) because of illegal logging and excessive use of wood as fuel for agriculture and the uncontrolled grazing of livestock. Cutting and subsequent soil erosion can cause serious negative consequences of natural disasters of destructive power. Legally all forests are state property, but de facto it is a common property of Tajik people. Although the forestry sector has become one of the most important sectors for development among the government and development partners only recently, it has long been an essential sector of the economy. Due to shortage of the sources of fuel, rural households rely heavily on fuelwood, particularly for cooking and heating (according to official estimates, one of every two households use firewood as their main source of fuel), causing the situation when demand exceeds the offer. Mowing grass and hay harvest are source of income as well as fodder for livestock. Forest source of food such as berries, nuts, fruits (for example, apricots, apples, plums, cherries, walnuts, pistachios, almonds, mulberries and hawthorn), honey, medicinal plants and herbs. All these products are either consumed or sold by residents, thereby facilitate the development of the local economy.

The gender aspect of forestry is not entirely understood. Sex-disaggregated data on employment in leskhozoes (forestry departments) and other enterprises engaged in forest products is limited and contradictory, possibly due to the use of various research methods. The Forest Sector Development Strategy stated the gender imbalance in employment in the forest industry; 92 % of employees are men. According to the FAO Forest Resource Assessment in 2008, there were only 23 women (two per cent) in the total number of employees (1,002) working in public forest institutions. Labor market statistics for 2015 show that the total number of people employed in "forestry" was 1,700, of which 200 (or 12%) were women³⁵⁷.

Women and men play an important role in the conservation of forest resources, ceasing to use harmful agricultural practices (farming and grazing) and identifying species of native plants that can be used for reforestation in the future. Both women and men have specific knowledge of trees and non-wood forest products, which must be taken into consideration at forestry managing process. However, since women are mostly absent in the formal forestry sector (in employment and in politics), special efforts need to be made to share their knowledge.

Forest Sector Development Strategy for 2016-2030 and National Action Plan for the first five years, which is under development, should raise awareness about gender inequality in the forest sector. The strategy proposes the creation of a national forestry advisory board, which should include members of the Committee for Family and Women's Affairs and gender experts. According to the draft of the National Action Plan, the Forestry Agency will regularly analyses the industry using quantitative and qualitative indicators, some of which will reflect gender issues.

³⁵⁷ Labor Market 2016. Agency for Statistics under the President of the Republic of Tajikistan

6.7. GENDER ASPECTS OF COMMUNITY RESILIENCE TO CLIMATE CHANGE

There is general level of the understanding of importance of the relationship between climate change and gender issues. The survey in Tajikistan shows that there are two key factors that enhance efforts to achieve gender equality: traditions and gender stereotypes regarding the role of women within family and society; as well as many female-headed households due to large-scale labor migration of men.

Although much had been achieved, especially at the level of legislation and strategic planning to achieve gender equality in education, economic opportunities, access to natural resources particularly to land and water, for effective promotion of gender issues and climate change the following challenges should be overcome:

- Low level of awareness about the relationship between gender and climate change;
- Lack of political will and recognition, especially at the level of local authorities and the community, of the relationship between climate change and gender among decision makers;
- Lack of information on the climate change risks, especially among women;
- Low level of knowledge among women and men about women's rights for natural resources particularly for land, water resources, pastures and forest lands;
- Low level of women's capacity in the application of technologies for sustainable management of natural resources adapted to climate change;
- Inadequate level of integration of aspects related to gender and climate change in the programs of international organizations;
- The general lack of an effective regulatory and institutional system for integration of multi-disciplinary planning, monitoring, reporting and budgeting activities that would contribute to gender and climate change considerations.

Based on the results of the review, to improve the process of promoting the relationship of gender and climate change in Tajikistan, the following measures are expected to be taken.

Raising awareness and improving understanding of the relationship between gender and climate change:

- Conduct research that provides evidence-based information on relationship between gender issues and climate change, as well as on benefits from improving women's participation at political and economic activities;
- Adapt and apply women's knowledge and experience of local characteristics, define their needs to address gender-specific aspect in reducing climate change and risk reduction activities.
- Develop and disseminate training products and materials (brochures, articles, videos, training programs) and conduct awareness-raising activities (eg, lectures, seminars, lectures, companies) in collaboration with the media and NGOs;

Improving the system of promoting development related to gender and climate change aspects in planning, budgeting and implementing:

- Promote and facilitate integration of the gender and climate change aspects in the system of local development planning;
- Support the development of gender-oriented laws as the reflection of socio-cultural relationships between women and men with regards to management of natural resources (land, water);

- Develop and promote the use of gender-oriented public and private financial schemes (for example, taxes, subsidies, tariffs, grants, bank loans and loans, microloans) aimed to reduce the impact of climate change;
- Improve funding for women's organizations and entrepreneurs working at minimizing negative impacts and adaptation to climate change;
- Improve the integration of gender and climate change aspects in the planning and implementation of international development assistance projects;

Strengthen capacity and provide more opportunities for the active participation of women in sustainable socio-economic development with regards to climate change:

- Strengthen women's capacity to environmental and climate risks (for example, climate risk training, early warning of natural disasters) to better respond;
- Support and promote women's representation and active participation in activities and institutions, related to climate change, protection and management of ecosystems and natural resources (for example, in involving women in the land, water and other resources management structure, for example, in managing WUAs and PUAs (water /pasture users associations));
- Promote better representation of women in development planning processes (for example, in long-term and medium-term development strategies, and sectoral strategies), through using quotas where it is possible;
- Promote better representation of women in the management and implementation of government or donor projects related to climate change.

7. FOCUSED GROUP DISCUSSIONS: WOMEN AND CLIMATE CHANGE IN KRB



**FGDs with women in Nosiri Khisrav (1), Qabodiyon (2-3), and Shaartuz (4) districts, from left to right.*

The Focused Group Discussions with women were held during 19-26 December 2018, during the Stakeholder Consultation meetings, as a preliminary step towards a more comprehensive discussions to be carried out during the Inception Phase of Project implementation. The scope of the current discussions would not be sufficient in terms of women representativeness in voicing their preferences concerning demonstration activities proposed by the project. It is the view of the Mission Team that village-by-village analysis would reveal a more accurate state of gender gaps and quality, on the basis of which a detailed Gender Action Plan could be developed and thereby equal opportunities for men and women in project implementation would be ensured.

At this point, however, the Mission Team was tasked to get a first hand initial view and was able to (a) identify preliminary state of gender issues and gaps, and (b) identify needs for empowerment of rural women towards adaptation to climate change in target areas. In that regard, the mission member – **Mrs. Sojidamo Tagoeva, Gender Consultant**, led focused group discussions with female participants of the consultation meetings. Among women participants were (a) local government representatives, dekhkan farms managers/deputy managers and else, members of Association of Dekhkan Farms, private sector representatives, representatives of local branches of centralized agencies and ministries, and community members of target districts.

In total, 39 women took part in focused group discussions altogether from six districts. Although, the number of women-participants is considered low (out of 191 respondents), the Gender Consultant have led the discussions noting their views and opinions accurately using flip charts. Low attendances by women in meetings at district, Jamoat and even village levels is a common problem in rural Tajikistan, considering that present population of women in many villages is higher than men due labor out-migration of working male population to Russian Federation and elsewhere. Such under-representation of female participants is linked to the following factors traditional to women – (a) responsibilities for basic household management and child rearing, (b) managing small land-holdings and (c) livestock within their households. In addition, women happen to be actively involved during peak agricultural seasons in planting/sowing and harvesting of agricultural crops.

Therefore, the Mission Team recommends that women in target areas are consulted appropriately taking into consideration the abovementioned factors. Village-by-village consultations, visits to female-headed households must be carried out during Inception Phase and beyond peak agricultural seasons.

Discussions with women have been organized in three sessions. During the first session the extended list of demonstration activities had been presented, and given opportunities to assess which of them would be suitable for them in implementation. During the second session, women

were asked which demonstration activities would top their preferences, and in the third session which income generating activities would be of greatest interest to women and which are specific to the given district. During each session, participants took consideration of applicability to ecosystems-based adaptation interventions, while marking their priorities. Below tables (Tables 13, 14, and 15) conclude the outcomes of such discussions:

Table 13. Suitable demonstration activities and role of women (Gender Analysis).

#	List of sub-project activities	Target group	Role of women
1	Terracing	Men and women	Planting, maintaining.
2	Bio-drainage	Men	
3	Establishment of saxaul plantations	Men and women	Planting, maintaining.
4	Commercial plantations in salinized /degraded lands	Men and women	Land management, plantation of fruit trees, maintaining, etc.
5	Stone lines	Men	
6	Organic mulching of croplands	Men and women	Mulching of arable lands, etc.
7	Diversification of crops and use of drought-resilient crops	Men and women	Plantation drought resistant crops and performing other activities related to diversification, etc.
8	Horticulture in greenhouses (lemon, tomato, cucumber)	Men and women	General management of greenhouses, harvesting, marketing/ processing of greenhouse products, etc.
9	On and off-farm agroforestry	Men and women	Irrigation of lands; planting of inter-row trees and crops, etc.
10	Planting of woodlots for fuelwood and timber	Men and women	Planting of trees, establishment of forest plots, production of wood and firewood, etc.
11	Rehabilitation/ Restoration of degraded forest ecosystems e.g. planting indigenous trees in micro-basins.	Men and women	Planting of trees of local varieties in small basins, etc.
12	Sowing of indigenous grass seeds (primarily palatable species) in degraded rangelands	Men and women	Sowing of local grass seeds on degraded pastures, etc.
13	Rotational grazing practices	Men and women	Perform necessary activities for development and rotation of pastures, etc.
14	Agro-processing options	Men and women	Processing of agricultural products, harvesting, marketing/processing of products, etc...
15	Climate/drought-resilient seed varieties	Men and women	Sowing of drought resistant varieties of seeds, etc.
16	Inter-cropping	Men and women	Perform inter-row sowing, etc.
17	Seed system support measures, seed banks	Men and women	Establishment and development of seeds banks, marketing of seed banks, etc.

18	Extension advisory services	Men and women	Provide and promote consulting services, extension of consulting services, etc.
19	On-farm water resource management and efficiency improvement measures;	Men	Water resource use registry, fair-distribution management.
20	Rehabilitation of degraded lands and land degradation control through pasture management;	Men and women	Restoration of degraded lands and combating land degradation through pasture management.
21	Soil fertility improvement	Men and women	Improving soil fertility.
22	Sustainable sloping lands cultivation - including agroforestry, orchards, woodlots and shelter-belts	Men and women	Cultivation of sloping lands, management of agroforestry, horticulture, flatter areas, and shelterbelts, etc.
23	Joint forest management (including agro-forestry)	Men and women	Establishment of close collaboration on forest management, including agroforestry, etc...
24	Energy-efficient stoves	Men and women	Use of energy efficient stoves
25	Establishment of Pasture Use Groups	Men and women	Establishment and management of pasture-users groups, etc...
26	Nurseries for forests development/support	Men and women	Establishment of nurseries, planting of trees in the nurseries, expansion of forests, etc...
27	Building capacities of communities for adaptation to climate change (seminars, trainings), including women	Men and women	Promote capacity building at the community level, including women on adaptation to climate change through dissemination of information about project, awareness campaigns and experience exchange, etc...
28	Demonstration plots for effective water resources management with climate change considerations	Men and women	Establish and manage of demonstration plots for efficient water use and other adaptation measures considering climate change, etc...

As noted in Table 13 above, nearly all of the proposed demonstration activities are applicable both to men and women. Participating women were asked to mark activities in which they would be willing and able to engage should the project support such activities in their communities. However, women have also noted that considering their time and duration of engagement in activities outside of their households, they would be able to contribute in particular with lighter labor support compared to men. Therefore, the extent of such contribution per each activity is yet to be further assessed during the Inception Phase of the project.

Table 14. Women empowerment needs - priority support and demonstration activities for women towards adaptation to climate change.

#	Target District	Women Empowerment Needs
1	Kabodiyon	1. Training on proper cultivation of agricultural products;
		2. Training on saving of agricultural products in the cold-storage points;
		3. Establishment of mini-workshops for processing (canning and drying) of agricultural products (vegetables and fruits);
		4. Establishment of cold storage points for saving of agricultural products;
		5. Involving of women on growing of agricultural products in the forests;
		6. Establishment of greenhouses for production of vegetables, including flowers and lemons;
		7. Establishment of small farms for poultry and livestock breeding.
2	Nosiri Khisrav	1. Training on proper growing of agricultural products;
		2. Training on saving of agricultural products in the cold-storage points;
		3. Establishment of mini-workshops for processing (canning and drying) of agricultural products (vegetables and fruits);
		4. Establishment of cold storage points for saving of agricultural products;
		5. Involving of women on growing of agricultural products in the forests;
		6. Establishment of greenhouses for production of vegetables, including flowers and lemons;
		7. Establishment of small farms for poultry, turkey, quail and livestock breeding;
		8. Establishment of gardens for planting and growing of pistachio trees in the forests;
		9. Establishment of grape-gardens;
		10. Establishment of mini-workshops for cleaning and processing of cotton.
3	Shaartuz	1. Job creation for women;
		2. Training for women on drying of fruits: grapes, apricots, figs, apples, etc...
		3. Establishment of greenhouses for production of vegetables, including flowers and lemons;
		4. Establishment of cold storage points for saving of agricultural products;

		5. Establishment of mini-workshops for processing (canning and drying) of agricultural products (vegetables and fruits);
		6. Establishment of mini-workshops for processing of dairy products.
4	Fayzobod	1. Lack of clean drinking and irrigation water;
		2. Job creation for women;
		3. Lack of financial resources for production of agricultural products;
		4. Training on processing of agricultural products (canning of vegetables and drying of fruits);
		5. Establishment of greenhouses for production of vegetables;
		6. Establishment of mini-workshops for processing (canning and drying) of agricultural products (vegetables and fruits);
		7. Establishment of small farms for poultry and livestock breeding.
5	Varzob	1. Establishment of greenhouses for production of vegetables;
		2. Establishment of cold storage points for saving of agricultural products;
		3. Plantation of fruit trees in the forests;
		4. Establishment of small farms for livestock breeding;
		5. Plantation of potatoes, vegetables and fruits;

		6. Training on drying of fruits, rose hip and hawthorn;
		7. Training on processing of agricultural products (canning of vegetables and drying of fruits);
6	Vahdat	1. Training on proper cultivation of agricultural products;
		2. Training on saving of agricultural products in the cold-storage points;
		3. Establishment of mini-workshops for processing (canning and drying) of agricultural products (vegetables and fruits);
		4. Establishment of cold storage points for saving of agricultural products;
		5. Involving of women on growing of agricultural products in the forests;
		6. Establishment of greenhouses for production of vegetables, including flowers and lemons.

Table 15. Potential district-specific income generating projects in support of EbA interventions in target districts.

#	District	Income generating projects for women	Type of additional support
1	Kabodiyon	Women are engaged in marketing of almond product. They buy raw almond fruit from owners and process it (dry raw almond, peel almond, break and separate almond bone from its fruit) and sell dried almond product in the local markets.	<p><u>Development of horticulture, including almond plantations/gardens. Trainings, small-grants project, equipment for products processing. Further support throughout value added chain scheme for women groups.</u></p> <p><u>Training for women groups on conservation of biodiversity, building adaptation capacities to climate change.</u></p>
2	Nosiri Khisrav	Women are mainly engaged in marketing of pistachio and “Sanjid” (Tajik name of this	<u>Development of horticulture,</u>

		<p>product) products. They collect pistachio from forests and collect “sanjid” product from owners in the village. They process pistachio product (peel, dry, break, separate pistachio bone from its fruit) and sell dried pistachio in the local markets. <u>“Sanjid”</u> product will be sold right after collection or after drying. No need to peel <u>“sanjid”</u> product.</p>	<p><u>including pistachio and “sanjid” product gardens. Provide training, grants and/or advanced technology/equipment for processing of these products. To engage women in processing and marketing of pistachio and drying of “sanjid” products. Arrange training for local people and target women group of community on conservation of biodiversity, negative influences and adaptation to climate change.</u></p>
3	Shaartuz	<p>Women have voluntarily organized themselves into Women Initiative Groups (WIGs), and have already typically rendered services to Dehkan Farms. Dehkan Farms have been benefiting from their services during peak agricultural seasons, such as: <u>collecting/ harvesting of fruits, clearing of onion lands from grasses (weeding), cultivating of potato lands, clearing of cotton lands from grasses and other manual works.</u></p> <p><u>WIGs have been mobile enough through rent of vehicles providing transport services to their members to remote lands of dehkan farms. DFs pay salaries to WIGs based on executed volume of works and based on negotiated prices by both sides.</u></p>	<p><u>WIGs can be established for executing specific seasonal tasks related to forest, pasture management and other project activities.</u></p> <p><u>Provide training, grants and/or advanced technology/equipment for processing of fruits and vegetables.</u></p> <p><u>Engaging women in processing and marketing of fruits and vegetable products.</u></p> <p><u>Training for women groups on conservation of biodiversity, building adaptation capacities to climate change.</u></p>

4	Fayzobod	<p>Women have voluntarily organized themselves into Women Initiative Groups (WIGs), and have already typically rendered services to Dehkan Farms. Dehkan Farms have been benefiting from their services regularly and also during peak agricultural seasons, such as:</p> <p>Planting and harvesting rosehip, hawthorn, and different medicinal herbs.</p> <p>WIGs have managed to conclude agreements with Forest management entities and based on concluded agreements collected/harvested rosehip, hawthorn, and medicinal herbs from forest lands.</p> <p>Harvested crops were divided by both parties based on following proportion: 30% of crops were received by WIGs and the rest 70% of crops were</p>	<p><u>WIGs can be further supported for executing similar specific seasonal tasks related to forest management and other project activities.</u></p> <p><u>Providing training, grants and/or advanced technology/ equipment for processing of these products.</u></p> <p><u>Engaging women in processing and marketing of target products.</u></p> <p><u>Training for women groups on conservation of biodiversity, building adaptation capacities to climate change.</u></p>

		handed to forest management entities. WIGs have sold, processed (dry products, make jams) and/or used collected/harvested products for own family consumption.	
5	Varzob	Youth (men and women) are engaged on collecting/harvesting of medical herb (called “Siyoh alaf” in Tajik) and mountainous products, like: stinky ferula, pie plant (called “Chukri” in Tajik). These products are sold in local Varzob and Dushanbe markets.	<p><u>Restoration of plantations of medical herbs.</u></p> <p><u>Provide trainings, grants and/or advanced technology/equipment for processing of these products.</u></p> <p><u>To engage men and women in processing and marketing of these products.</u></p> <p><u>Training for women groups on conservation of biodiversity, building adaptation capacities to climate change.</u></p>
6	Vahdat	<u>Women are mainly engaged in producing of agricultural products (vegetables and strawberry) and sell products in local and Dushanbe city markets and Dushanbe – Vahdat main road.</u>	<u>Provide training, grants and/or advanced technology/ equipment for processing of vegetables and strawberry.</u>

			<p><u>To engage women in processing and marketing of these products.</u></p> <p><u>Training for women groups on conservation of biodiversity, building adaptation capacities to climate change.</u></p>
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The tables above (Table 14 and 15) is the summary of discussions with women with regards to preferred support within the framework of proposed demonstration activities by the project. The list of preferred actions can be summarized as follows:

- Support in establishing and managing greenhouses for cash crops (vegetables: potatoes, tomatoes, cucumber, herbs, etc);
- Support in establishing and managing nurseries towards forest development, commercial herbs and tree plantations (fruit gardens – grapes, apples, etc);
- Support in animal husbandry, livestock and poultry production;
- Apiculture (bee-keeping), pistachio plantations, almonds, rosehip and hawthorn planting, and medicinal herbs growing in demonstration plots (part of agro-forestry, fruit-gardening, forest development);
- Support in building cold storage houses, establishment of processing workshops for agricultural products, etc.
- Cultivation of agricultural products – effective techniques in the context of climate change adaptation.

During the discussions in each target district, it was revealed that participating women have already been active in the past and have experience in self-empowerment activities in their communities. They have demonstrated different potentials in income-generating opportunities for themselves through being involved in demonstration projects implemented by development agencies, NGOs and local government initiatives. Such practices have led women to be financially independent and contributed to livelihood improvements in their families.

In particular, in a number of districts and communities, women have been able to fill gaps (in the result of male labor out-migration) in service provisions to local Dekhkan Farms in their agricultural activities, planting and harvesting of certain products in forestlands. Women have managed this through organizing themselves into **Women Initiative Groups** and achieved collective contracts with Dekhkan Farms on foreseen works at different times of the year. Moreover, women have especially demonstrated **collective mobility** to remote farm lands through rent of vehicles and transport services. This is an important observation in the context of the proposed project, in the framework of which there will be a number of demonstration activities to be implemented in some remote agricultural lands, pastures and forests.



* Discussions with women participants in Dushanbe city, Fayzabad and Varzob districts, from left to right.

In addition to the given experience and practices, discussions with women were also focused on scaling up their role and empowerment needs with support of the given project towards adaptation to climate change. In summary, such improvements may be achieved through the following support:

(a) Value Added Chain support in agriculture

Given the current experience and capacities, women have been enthusiastic to participate in the entire value-added-chain in agriculture beginning from planting and production towards processing and marketing of products in local markets. This provides good income-generating opportunities and food security for their families. During project implementation, while designing demonstration activities in certain communities, women have greater adaptation capacities to climate change if the products their produce are supported in particular with adequate storing and processing. In the context of certain adversities caused by climate change, drastic changes in temperatures in certain regions, proper storing and timely processing of agricultural products has become ever more important for women.

(b) Greenhouses and nurseries

In the context of changing agricultural landscapes due to consequences of climate change, women have been more interested in managing greenhouses for cash-crops and would also be interested in maintaining nurseries for forest development and plantations. For this, they would need support in business plan development, start-ups, financial planning, construction-maintenance-production schemes for such a complex undertaking.

(c) Women Initiative Groups

Women Initiative Groups have demonstrated their ability to serve certain agricultural entities with a range of services, such as collective planting, maintaining, and harvesting of agricultural lands, agro-forestry, forests management, apiculture (bee-keeping), animal feed production and else. Services so far have been provided to small and medium dekhkan farms and forestry agencies (local district entities). Through this project support, women could be mobilized in forms of Women Initiative Groups in an organized manner both in agriculture and forest development demonstration activities. Such has been already successfully launched in certain areas of other watershed and therefore could be replicated through this project as well.

(d) Small grants projects to women groups

Discussions revealed that women would be more interested in commercial side of ecosystems restoration and adaptation activities, if such are combined with small business opportunities, i.e. demonstration activities which provide some income-generation for women. In particular:

- **Apiculture** (bee-keeping), cash crops, commercial plantations within demonstration plots as part of agro-forestry and bio-diversity actions in the project;
- **Animal feed production** opportunities as part of agro-forestry and bio-diversity actions in the project;
- Planting and collecting of **medicinal herbs** in demonstration plots and nearby areas;
- Further support in **animal husbandry and livestock breeding** towards further productivity of household livestock, etc.
- [Small greenhouses and nurseries nearby demonstration plots and/or nearby household lands.](#)

8. CONCLUSIONS AND RECOMMENDATIONS

In the 2014 edition of the Social Institutions and Gender Index (SIGI), Tajikistan reportedly has medium levels of discrimination against women in social institutions (SIGI score of 0.1393). It has lower discrimination in restricted access to resources and assets and higher discrimination in son bias.

During the project preparation phase, the following key gender issues were identified:

- r. In 2012, the ratio of female to male primary education enrolment was 98%. In 2011, the ratio of female to male secondary school enrolment was 88% and 97 for primary education. The male/female sex ratio for the working age population in 2013 is 0.98. Rigid notions of men's and women's roles in society and in the home remain. It is believed that men should occupy the role of breadwinner and head of the household, while women should confine themselves to domestic and care work within the home.
- s. Under the Land Code, women and men have equal rights to access and manage land. According to the World Bank (2011), 78% of female-headed households (where there is no working-age male) manage land, compared to 89% of male-headed households, and 91% of female-headed households with at least one working age male.
- t. The Tajik Civil Code gives women the right to have access to property other than land and to enter into contracts in their own names. In practice, property is routinely registered in the name of husbands or male relatives, as property ownership is seen as a male prerogative. In addition, most married couples live in property belonging to the husband's parents, meaning that the wife often has no legal claim on the property at all. Many women are still unaware of their rights and the opportunities available to them as a result of the land reform processes that began in the 1990s. Even when they do know their rights, registering a farm is a complex administrative process. When women are allocated land in their own right, it is often of poor quality for farming, and they are often denied access to land belonging to their husbands in the event of divorce or widowhood. In addition, requirements in the Land Code that land only be allocated to those who are qualified to manage it discriminate against women, given that few have formal agricultural qualifications, and local officials tend to view them as incapable of running a farm. Women lack education, access to productive resources, and technical training that would enable them to increase productivity above subsistence levels, and increase wealth.
- u. Under the Family Code and the Civil Code, within registered marriages, spouses have equal property rights, but this does not apply to unregistered, religious marriages, leaving many women unable to claim their property rights when the relationship breaks down.

The project activities have been designed to address some of these gender-related issues, as follows:

- v. The project will facilitate the employment, training and equipping of woman as community liaison officers, forest enforcement staff, local environmental enforcement staff.

- w. The project will actively encourage the equitable use of women labour and supervisors from local rural villages in: the planning and implementation of pasture management plans; the planning and restoration of degraded high altitude pastures; and the planning and rehabilitation/restoration of high altitude forests.
- x. The project will ensure that women-owned and/or managed businesses participate equitably in the procurement of project-funded materials, supplies, equipment and infrastructure. In some instances, the project may adopt a preferential procurement approach to the provision of minor services and supplies from local women-owned businesses.
- y. The project will ensure that the reach of project-funded education/awareness-raising programmes, sustainable livelihood development support, and skills training will include both male- and female-headed households from the targeted villages.
- z. The project will ensure that the interests of women and women-headed households are adequately represented on River Basin Development Plans, Pasture User Unions and Participatory Forest Management Committees; and are actively involved in the planning of protected areas, pastures and forests and generally in planning of all EbA related interventions in the project implementation planning domain.
- aa. The project will ensure that the reach of project-funded support include both male- and female-headed households from the targeted villages.
- bb. The project will actively assist women-headed households living in the high altitude areas to access: (i) small sub-project support for sustainable livelihoods; and (ii) technical and financial support from project grants for developing and installing alternative fuel and energy systems, income generating business opportunities, and implementing more sustainable pasture management practices.
- cc. The project will commit dedicated financial and technical support to addressing the significant knowledge constraints in pasture users from women-headed households.
- dd. The project will ensure that the River Basin Management Plan includes strategies, activities and budgets that will enable and finance the equitable involvement of women in the implementation of the plan.
- ee. The project will advocate for an increase in the number of women involved in research and monitoring of pastures, forests, conservation areas, where EbA related activities are being carried out.
- ff. The project will collaborate with the project-contracted businesses and international experts to continually develop and implement mechanisms which may further strengthen the capacities of local women and women-headed households across the project planning domain.

- gg. Incorporate specific awareness activities for women and vulnerable groups (children, elderly, disabled) into all communication activities to reduce disproportional vulnerabilities and ensure inclusivity of the measures.

The project will promote women's equality and empowerment, including participation in project decision-making. The project will ensure that women receive an equitable share of benefits and that their status and interests are not marginalized. Participatory processes will include specially designed methodologies that enhance the participation of women and therefore enhance the inclusion of their views into the activities of the project, using existing mechanisms for representing women's views.

For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated in relevant project reports (Inception Report) as well as updated within ESMF and SES. Furthermore, when possible, measures and techniques that can have a positive impact by closing the gap of inequality between men and women will be promoted.

Given the relatively higher rates of labor migration among men (to Russian Federation and else), households without manpower, i.e. female-headed households, may also be considered vulnerable. Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project design and implementation.

Marginalized groups in project area of Kofirnighan river basin can be considered poor and vulnerable population that potentially include those living in places with increased impacts of climate change, food insecure households, households with limited or no productive assets (limited resilience), livestock and/or agricultural land plots.

Prior to project implementation, during inception phase, the project will carry out a comprehensive vulnerability assessment of target communities in participatory manner holding focused consultations in designing specific tailor-made activities suitable for vulnerable and marginalized groups. Where feasible such groups will be prioritized for concrete adaptation interventions.

The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women's committees, intervention related initiative groups, pasture development associations, Water User Associations (WUA), forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized within such groups and associations.

Among targeted actions that may be prioritized and suitable for vulnerable groups may include on-farm adaptation interventions, household plots productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) may also be suitable for the given groups to ensure benefits are distributed inclusively and in equitable manner.

During the Inception Phase of the Project, when relevant sub-projects will be short-listed and prioritized for concrete communities, a more detailed Gender Analysis will be carried out along with development of Gender Action Plan that will cover identified target communities.

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United Nations Development Programme

LAND USE AND CLIMATE CHANGE:

RESTORATION OF FORESTS AND PASTURES IN SELECTED DISTRICTS OF KAFERNIGAN RIVER BASIN

Towards development of the Project Proposal –
*“An integrated landscape approach to enhancing the climate resilience
of small-scale farmers and pastoralists in Tajikistan”*

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1. INTRODUCTION

Tajikistan is a small landlocked country in the heart of Central Asia, bordered by Afghanistan, China, the Kyrgyz Republic, and Uzbekistan. The country has abundant water resources, contributing to its specialization in cotton production and a considerable hydropower generation potential. Only 7 percent of its total land area of 143,000 square kilometers is arable. High mountain ranges across its territory make communication between different parts of the country difficult, especially in winter. Tajikistan is highly susceptible to natural disasters, and is regularly affected by floods, landslides, and droughts. Up to 40 percent of the country's national workforce is employed abroad (mostly in Russia) and sends home remittances equal to more than one-third of its gross domestic product. However, with global financial crisis and economic downfall in Russia associated with sanctions the remittance incomes are already adversely affected. Preliminary forecasts from IMF and the World Bank suggest that remittance income will fall by more than the 31% fall in remittance income. Lastly, low agricultural productivity and rudimentary safety nets still leave those below the poverty line vulnerable to shocks and stresses, including women who have experienced lowered rates of poverty reduction than men. The above factors combine to make Tajikistan one of the poorest and most vulnerable economies in the world.

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Climate change induces serious problems for Tajikistan, as the country is very vulnerable to it and has a low adaptation capacity. World Bank ranks Tajikistan as the most vulnerable countries in Central Asia³⁵⁸. Of the 180 countries ranked by the global adaptation index of the University of Notre Dame, Tajikistan is on 111th rank. Tajikistan ranks 78th among the most vulnerable countries and 52nd among the less prepared countries. Compared to other countries in the index, its current state of vulnerability is manageable. However, improvement in readiness is essential

³⁵⁸ Gelbert R., Reva A., and Zaidi S., 2012, Tajikistan: Economic and Distributive Impact of Climate Change (No. 10047). The World Bank.

to maintain a better adaptation to future climate change and climate-related difficulties.³⁵⁹ Tajikistan has the 29th rank in the Index for Long-term climate risks³⁶⁰.

Extreme climate events (such as floods, droughts, avalanches, landslides) periodically destroy land, crops, infrastructure and sources of income. Annual losses from climate change and extreme weather events are estimated at \$ 600 million, or 4.8% of Tajikistan's gross domestic product (GDP). Climate-induced losses will continue to increase with the rising temperature and precipitation. By 2030, the average temperature is projected to increase by 2.3°C. The average amount of precipitation is likely to increase by 8% in areas up to 2500 m above the sea level and decrease by 3% in the mountainous areas.

Climate change can cause adverse consequences by affecting a variety of different social, cultural, economic and natural resources in Tajikistan. More frequent climatic extremes can adversely affect the functioning and stability of both anthropogenic and natural systems, as well as further exacerbating the losses and damage caused by climate change. The country is likely to experience significant additional economic losses, humanitarian problems and environmental degradation unless immediate measures are taken to reduce vulnerability and enhance adaptation.

Unless urgent and timely action is taken, Tajikistan will suffer tremendously. It is in the context of this reality that Tajikistan's National Development Strategy until 2030 outlines hazard risk reduction along with adapting to climate change as critical for the country to achieve its long-term sustainable development goals and objectives. To give effect to this, Tajikistan has tapped into a number of funding sources and is implementing several related projects. In 2018, Tajikistan made a significant step towards advancing the climate change adaptation agenda by tapping into another such source with the endorsement of its Project Concept Note for Adaptation Fund Project. The endorsement paves the way for the development of the full project proposal, that will be undertaken by UNDP in Tajikistan in partnership with the Committee for Environmental Protection, under the project "Facilitating Climate Resilience in Tajikistan" funded by the Russian Trust Fund for Development.

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2. PURPOSE

³⁵⁹ Notre Dame Global Adaptation Index. <http://index.gain.org/country/tajikistan>

³⁶⁰ Craft S., Eckstein D., Dorsch L., and Fisher L., 2015 Global Climate Risk Index 2016: Who suffers the most from extreme weather events? Losses due to weather in 2014, a comparison of 1995. by 2014.

In September 2018, UNDP has developed a draft project proposal – “*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*” to the Adaptation Fund. Following the submission of the proposal to the Adaptation Fund, UNDP received an official response on 1 April 2019 from the AF Board suggesting that UNDP reformulate the proposal, taking into account the observations in the review sheet annexed to the notification of the Board’s decision, as well as the following issues:

- c. The fully-developed proposal should submit a revised Environmental and Social Policy risk identification analysis including the significance of the risk identified (e.g. low, medium, high), the outcome of the screening process indicating the risks that may be triggered, as well the relevant environment and social assessments in compliance with the Adaptation Fund Environmental and Social Policy principles;
- d. Since the priority list of ecosystem-based adaptation (EbA) sub-projects that constitute over US\$ 6 million of the budget have been identified, the assessments mentioned in Section V, Annex 4 (gender analysis, marginalized and vulnerable groups assessment, ecological and land use assessment, pasture use assessment and other relevant assessments) should be submitted along with the resubmitted proposal;

The purpose of this report is therefore to address “Item B” (as above), specifically in part to provide assessment of land use and climate change in selected districts with focus on needs for restoration of forests and pastures in selected districts of Kafernigan river basin. The given targeted analysis and assessment would provide further insight into anticipated risks, mitigation/management measures to be carried out for sub-projects identified for implementation within the framework of the project.

3. METHODOLOGY

The present reports has been prepared based on the information available with the District Development Plans of six targeted districts in Kafernigan River Basins. The given development plans have been prepared by the district authorities (Hukumats) with the support of the UNDP and other partner development organizations and agencies. The given DDPs in their turn have been prepared from a series of sources both qualitative and quantitative information with special emphasis on gender, environmental protection (climate change, disaster risk reduction and mitigation).

The following District Development Plans had been used for compiling the present report:

- (a) Programme of socio-economic development for Fayzabad district 2016-2020;
- (b) Programme of socio-economic development for Qabodiyon district 2016-2020;
- (c) Programme of socio-economic development for Nosiri Khisrav district 2015-2019;
- (d) Programme of socio-economic development for Shaartuz district 2019-2020;
- (e) Programme of socio-economic development for Vahdat district 2016-2020;
- (f) Programme of socio-economic development for Varzob district 2016-2020;

The report comprises of two main parts. The first part (Section 4) provides an overview of environmental protection for each of the selected districts of KRB. It includes a brief information about the state of environmental protection, local capacities, and main issues that need to be dealt with during the term of the development plans. The second part (Section 5) of the report provides a comprehensive overview with regards to land use structure and management, agricultural

production, animal husbandry. In this section, where applicable overviews on forests and pastures have also been specifically provided with needs for further restoration and rehabilitation.

The present report will provide a baseline for the monitoring and evaluation framework of the proposed Project “*An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan*”, and provides feedback for further monitoring of risks and impacts in the project’s context.

4. OVERVIEW OF ENVIRONMENTAL PROTECTION

4.1. FAYZABAD DISTRICT – UPSTREAM OF KRB

In the district, environmental issues are handled by the “Faizabad District Environmental Protection Department”, consisting of 4 people (head, 1 chief specialist and 1 leading specialist, 1 specialist and 3 contract workers). The main task of this department focused on appropriate protection and usage of natural resources (water, land, air, waste, hunting, fishing and other resources). There are many unresolved issues in the area, including salinity and deterioration of land reclamation in jamoats and forestry, reduction of forests and groves, increasing cases of deforestation and environmental pollution with solid household waste, deterioration of pastureland in the territory of rural jamoats Kalai Dasht, Miskinobod, Javonon and D. Aliyev, inefficient development of natural resources, including soil, sand, gravel, rubble, etc.

The irrigated land area is 6055 hectares. Notworthy that the agricultural workers of the district are mainly engaged in gardening and animal husbandry. More than 87% of the working population of the district lives in rural areas and mainly engaged in agricultural activities.

The main ecological difficulties in the district, on which the level of welfare of the population depends, relate to the following areas:

- Poor land-reclamation of 53 hectares of irrigated land is the result of rising groundwater levels in rural Qalayadash, Buston, Javonon and Mehrobod Jamoats due to the lack of maintenance and cleaning of 56-kilometer on-farm drainage networks and 29 km of inter-farm networks;
- Unsatisfactory condition of 25175 hectares of pastures located in jamoats and forestry areas, which leads to reduction of animal forage;
- Restoration of 900 hectares and efficient use of 1000 hectares of orchards and vineyards.

The results of the analysis show that irrigated land comprise only 5.3%. Currently, around 53 hectares of land are in an unsatisfactory reclamation condition. Delay in provision of mineral fertilizers and pesticides, climate change, the spread of various pests and diseases caused the decrease in the yield in the region.

During 2013-2015 it is expected to increase the area of shady trees and enhance forest area to 270 hectares in Faizabad district.

A significant environmental problem of the area is late collection of waste. The central landfill is located near Navobod village, Javonon jamoat, 12 km from the district centre. The landfill does not have a fence and contradicts environmental requirements. Due to heavy precipitation, canals and mudflow pathways require substantial restoration. The lack of public services at the jamoat level leads to the emergence of numerous illegal landfill, soil contamination, river banks and appearance of infectious diseases.

Another source of waste is the district medical institutions and veterinary service. Medical facilities should be provided with incinerators for burning hazardous waste, in addition, Becker pits should be allocated for the burial of dead animals. Currently, there is no appropriate equipment in Faizabad district that would contribute to environmental protection in the region. These consequences lead to flashes of diseases among the population, which result an increase in the cost of treatment as well as poverty level and decline of living standards.

In order to solve these problems on the territory of jamoats, it is necessary to allocate separate land plots for landfill and assist in organization of a private or state utility enterprise. There is no sewage line in Faizabad district, which impedes the construction and commissioning of high buildings in the district. The lack of sewage lines (especially in settlements) can cause pollution of surface and groundwaters.

Another problem is the lack of access to drinking water for the population in Faizabad district. In total 72% of the population can access the drinking water, while 28% suffers from its shortage. In the district center has only 210 km of the drinking water line, 135 km connected to the private houses. The rest of the population in the district uses surface and groundwater sources as well as springs and rivers.

The drinking water sources do not have sanitary protection zones and contradict construction standards, clean water tanks and cleaning system of the reservoirs do not have chlorine solution, and none of the water intakes of drinking water lines is protected. The Center for State Sanitary and Epidemiological Surveillance take water analysis for the disinfection of drinking. However, in recent years, due to a shortage of funds in the budget for water analysis, the rising cost of fuel, spare parts and reagents, drinking water analyses are rarely carried out in the district.

Various small and large industrial enterprises and individual dekhkan farms operate in the district. One of the concerns in particular sphere is lack of access, especially for rural Jamoats, to environmentally friendly water sources. In the district, only 72% of the population has access to sources of clean drinking water, the remaining 28 percent are not able to use this invaluable source. Many sources of drinking water supply of the area do not meet the requirements of sanitation and hygiene. The population of new established villages and part of the population of Bamo, Mehrobod and Vashgird jamoats do not have access to clean and disinfected drinking water. In these villages, the population uses water from canals and aryks, which are the main sources of infectious diseases.

In recent years, there is a growing tendency in construction works in Faizabad district. The main environmental problem in this dimension is unsatisfactory condition of the network of waste water and solid waste treatment. Consequently, there is a constant threat of contamination of groundwater and water of the Elok river with waste. As a result, all waste from the district center is dumped into the specified networks and illegal landfills. Existing sewerage networks and landfills are in poor condition, not meeting the requirements of sanitation, hygiene and ecology. In summer time, such spots become a perfect congestion of infectious diseases.

The district authorities organized 12 official points for the collection and disposal of waste, which are serviced by the state unitary enterprise “Hochagii Manzilyu Kommunalni”. In this case, unscheduled removal of waste from garbage cans has a negative impact on the environment. According to the existing reports, the population of the area releases 2,700–3,000 m of waste into the environment, which causes pollution of water and land. In some localities, waste is thrown into the river, near residential buildings and in unauthorized places. Poor management system and lack of constant control exacerbates the problem. These problems cause more concern at the village level.

One of the priorities and effective measures for the development of the industry in the future is to conduct outreach activities to protect the environment and improve the health of the population.

4.2. VARZOB DISTRICT – UPSTREAM OF KRB

In the district, the environmental protection department is managed by the “Environmental Protection Department of the Varzob District”, consisting of 6 people (head, 2 main specialists, 1 specialist and 2 contract workers). The main task of this department is appropriate control, protection of the use of natural resources (water, land, air, waste, hunting, fishing and other resources).

There are many unresolved issues in the industry, including insufficient technical capacity for waste collection (lack of garbage collection equipment and cesspool truck), lack of official landfills, and absence of waste collection system in Dehmalik, Ziddi, S. Aini, Luchob and parts of Chorbog villages (villages Chormagzakoni tojik, Chormagzakoni uzbek, Arakchin, Darabedo, Alkhuch, Sarikutal, Yakachuguz, etc.) lack of modern waste processing plants, special containers for waste collection, central sewage lines and treatment facilities, inefficient development of foothill lands without reducing the area of trees and forests, destruction of fish as a result of inefficient development of mineral resources, including coal, marble, soil, sand and gravel, etc., in the areas of Siyom, Kabuti, Maykhura, Chagatay and Changalak, cuttings of trees, pollution of rocks with solid household waste, degradation of pasture status.

Varzob district is one of the mountainous regions of the country, where agriculture is the main economic income and from this point of view, most environmental problems of the region are associated with agricultural activities. The geographical location, climate temperate and mountainous terrain of the region contribute to the development of forests. The main part of the territory is occupied by mountains, and the area of irrigated land constitutes only 1,516 hectares (located in the Kubodien and Rudaki districts).

The impact of the industrial activities on the environment is not significant. Fifteen small hydropower plants are located in the area: cement manufacturing company Tochikiston LLC, Takob Mining and Processing Plant (tungsten), 2 small sewing enterprises, 1 small wood processing plant, 4 water mills, 3 building materials enterprises (crushed stone and burnt brick), which do not have anthropogenic impact on the ecological condition of the district. The atmosphere of the territory is mainly polluted by the transport exhaust.

Dehkans of the region are mainly engaged in cultivation of potato, horticulture and animal husbandry. More than 81% of the working-age population lives in the village and works on agricultural fields. The main ecological difficulties of the district, on which the level of welfare of the population depends, relate to the following areas:

- lack of irrigation water in jamoats Chorbog (most villages), Luchob (Sayod, Kosatarosh, Novakandoz, Toikara, Durmanbulok villages), Dehmalik (Poshun, Zumand, Safedorak, Horn villages),
- Unsatisfactory conditions of pastures in the settlements of Shurtugai and Siyoma, has led to a decrease in the volume of animal forage,
- Necessary protection and effective use of forest plantations.

The results of the analysis show that irrigated land is only 1.5%. The yield of land area in recent years has decreased to 1.8%. The reason for yield reduction in the region is the lack of irrigation water, the spread of various pests and diseases, the deterioration of water supply facilities, the untimely provision of mineral fertilizers, effect of toxic chemicals and climate change.

In the framework of the “Program for the Development of Forestry of the Republic of Tajikistan”, the solution of acute problems in the forestry sector and main directions are envisaged for improvement of the economic level and environmental situation. The program envisions an

increase of the number of shady trees and expand forest area up to 43 hectares in the district during 2016-2020.

On the Takobi Bolo, Dehmalik, Pishanga and Pori sites of the Dehmalik rural jamoats there is a need to implement bank protection of 6-8 km canal, on Khusheri, Gažna and Shafti Mizhgon territories and Varzobkalam jamoats 14-17 km long canal, on Changalak, Duoba, Chagai, Uraha areas of approximately 12-18 km canal.

The pasture area constitutes 67811 hectares, where 39,739 hectares of pastures are at the disposal of dekhkan farms, including 454 hectares of irrigated land. The total number of animals is 94636 heads (2014), including 19004 heads of cattle and 75632 heads of small animals. In the region, 89.4% of livestock accounts for the population and 10.6 percent for the dekhkan farm sector.

The level of population's well-being highly depends on pastures' condition, their degradation leads to a reduction in incomes of the population due to livestock raising and increases a poverty. In accordance with the established rules of animal husbandry, 5 heads of small animals need 1 hectare of pasture, in Varzob district this figure is 0.89 hectares compared to summer pasture, which deviates from the norm by 0.11 hectares. As for winter pastures (46,797 hectares), this figure is 0.62 hectares, which is also less than the established norm by 0.38 hectares.

One of the significant environmental issues of the area is untimely waste collection. The district does not have a central landfill and waste is transported 53 km distance to the adjacent landfill near Dushanbe, which leads to increased costs and delayed cleaning of waste causing infectious diseases. Due to heavy precipitation, canals and waste disposal require substantial renovation.

The lack of public services at the jamoat level leads to the emergence of numerous illegal landfill, soil contamination, river banks and leads to an increased risk of infectious diseases.

Another source of waste is the district medical institutions and veterinary service. Medical facilities should be provided with incinerators for burning hazardous waste, in addition, Becker pits should be allocated for the burial of dead animals. Currently, there is no appropriate equipment in Faizabad district that would contribute to environmental protection in the region. These consequences lead to flashes of diseases among the population, which result an increase in the cost of treatment as well as poverty level and decline of living standards.

In order to solve these problems on the territory of jamoats, it is necessary to allocate separate land plots for landfill and assist in organization of a private or state utility enterprise. There is no sewage line in Varzob district, which impedes the construction and commissioning of high buildings in the district. The lack of sewage lines (especially in settlements) can cause pollution of surface and groundwaters. Another problem is poor access of the population to drinking water. The population's access to drinking water in general is 53.9%, while 46.1% of the population suffers from a shortage of drinking water. In the district centre, only 1.3 km of drinking water line are fixed. The rest of the population of the region uses surface and groundwater and springs.

The drinking water sources do not have sanitary protection zones and contradict construction standards, clean water tanks and cleaning system of the reservoirs do not have chlorine solution, and none of the water intakes of drinking water lines is protected. The Center for State Sanitary and Epidemiological Surveillance take water analysis for the disinfection of drinking. However, in recent years, due to a shortage of funds in the budget for water analysis, the rising cost of fuel, spare parts and reagents, drinking water analyses are rarely carried out in the district.

4.3. VAHDAT DISTRICT – UPSTREAM OF KRB

Environmental protection and emergency preparedness is one of the most important issues, and prevention of natural disasters, rational use and restoration of its resources and environmental sustainability it is the duty of every person. Today the lack of drinking water, air pollution, soil degradation, the destruction of rare plants, the warming of the planet and the climate change urged us to take all measures to prevent them.

The ecological state of the cultivated lands is relatively poor and almost 75 percent of them have not been planned for many years. One of the factors of deterioration of the irrigated lands reclamation is the improper use of nutrient fertilizers, mineral fertilizers, salts, and herbicides. Reconstruction of agricultural farms and their transformation into dehqan farms has led to the lack of knowledge of agricultural practices, excess irrigation, non-compliance of beds length, washing of soil fertility layer, swamping of lower ground, spread of weeds, raising groundwaters and not cleaning the drainages.

The construction of multi-storey buildings in the center of the city and rural areas has increased from year to year. Only 16 multi-storey residential buildings are scheduled for 2015 and construction is under way. In this respect to comply with ecological requirements is needed. Currently, 4 irrigation facilities are operating in Vahdat city in the field of wastewater disinfection. These facilities were built in 1967, and due to late repair, it leads to the destruction of underground pipes. Therefore, it is important that additional sediment basins and underground pipes be replaced by large pipes for plumbing. The ability of water pipes is 5.8 thousand cubic meter per a day, which is not enough for population growth and urban development. Most villages are located in villages Jamaats, where there are no waste storage places, and there are 60 industrial enterprises in the center of city, which throw their atmospheric waste to the atmosphere due to the lack of filters.

Urban and rural residents are not sufficiently aware of the environmental situation and in this regard undertaking a series of measures to provide information about the environmental situation is needed.

Another important environmental problem of the city is late collection of waste. In total, the city has 1 garbage collection, which does not meet sanitary and environmental standards. The lack of such services in the Jamaats leads to the emergence of informal waste storage places, environmental degradation, the risk of infectious diseases and an increase in the number of street dogs. As a result of the analysis, it was found that the number of non-domestic animals, including dogs, increased in the district. Over the past years, the number of dog bite cases (10-20 cases per year) has increased. Taking into account the cost of treatment, it leads to additional expenses of the population and the decline in living standards.

The main sources of air pollution are the contamination by the volume of waste substances on the motor vehicles, the use of fuel by the population, industrial objects and harmful substances.

The main advantages of the sector for the elimination of environmental problems can be expressed as follows:

- Construction of the administrative building with the laboratory and its equipment;
- Organizing utility services in rural areas;
- Increase the number of waste boxes in the district center and the villages;
- Increasing environmental awareness of the population through awareness raising campaigns;

- Facilitate the establishment and construction of waste-water disposal system of the city center;
- Establish a special reception center and waste disposal;
- Provide assistance in prevention of infectious diseases from domestic animals and poultry (biotechnical works);
- Preventing excess grazing, identifying the site of herbs germination and protecting them, disseminating information on the need to protect rare plants;
- Restoration and construction of gardens and plant nurseries;
- Preventing the coastal lands from salinization of soil through restoration of pumps;
- Planning the construction of a small enterprise for the disposal of solid waste.

4.4. QABODIYON DISTRICT – DOWNSTREAM OF KRB

Promotion of the environmental situation at the local level is carried out by the district’s environmental protection sector. The main problems faced by specialists of this sector are the lack of a modern laboratory, equipment and administrative building. Kubodiyon is considered as agrarian district, and from this point of view, the environmental problems of the region are closely related to agricultural activities. Geographical location, warm climate, flat relief of the region contributes to the development of cotton production.

The environmental problems of the district are similar to the environmental problems of other regions of the Vakhsh valley. One of the characteristic features of the area is that the area is located 2 meters below the level of the Kafernigan River. In this regard, the underground water level is too high, which caused the deterioration of the ameliorative state of agricultural land and the ecological situation. As a result, more than 1,432 hectares of agricultural land are in poor condition due to rising underground water levels and 90 hectares due to rising salinity.

In Kubodien district, 3 industrial enterprises and 1,929 individual farms operate. One of the problems in this direction is the lack of regulatory documents regarding the permissible limit of emissions, the conclusions of the state environmental impact assessment and the certificate. Along with this, the influence of harmful substances of industrial enterprises on the environment has not yet been fully studied. Existing enterprises have no control over the emission of harmful substances.

Table 1. Emissions of harmful substances from industrial enterprises

Harmful substance	2012	2013	2014
Total in ton/year	391,3	366,7	319,4
Out that solid waste	319,6	298,9	258,3
Carbohydrates	71,7	67,8	61,1

One of the issues of concern is the lack of access of part of the population, in particular rural Jamoats, to clean drinking water sources. In the district, only 72 percent of the population have access to clean drinking water, the remaining 28 percent are not able to use this invaluable source. Many sources of drinking water in the area do not meet the sanitation and hygiene requirements.

For many years, the population of rural jamoats Navobod and Zarkamar have no access to clean drinking water sources, as a result of which they suffer. In these jamoats, the population uses water from the canal. This water is a source of infectious diseases. In recent years, an increase of construction works has been observed in the district. The main environmental problem observed in this direction is the lack of sewage system. For this reason, there is always the threat of contamination of the underground water, as well as the Kafernigan River, which requires serious

attention. As a result, all waste produced in the district center is discharged into two collectors passing through the district center. In turn, these collectors are in poor condition, which does not comply with the sanitation and hygiene standards. In particular, for this reason, in summer, an increase in the number of infectious diseases is observed.

In the center of the Kubodiyon district, 1 official garbage point has been organized, and services are provided by the State housing and utilities service. In this direction, untimely removal of waste from garbage points has a negative impact. According to the available data, the population of the district emits 915.1 tons of waste per year, which causes pollution of water, soil and the environment. In some localities, waste is thrown into canals, near houses and in places not intended for it. A weak management system and the lack of constant supervision complicates the problem in this direction. These problems are most alerting at the village level.

One of the main priorities for further development is the work on the promotion of environmental protection and health improvement of the population. The main problems of the sphere are (a) inconsistency of drinking water sources with the sanitation and hygiene requirements; (b) lack of technical facilities; (c) non-compliance with environmental requirements by industrial enterprises district; and (d) weak advocacy on environmental issues among the population.

4.5. NOSIRI KHISRAV DISTRICT – DOWNSTREAM OF KRB

At present, the state of the environment is under the influence of a number of negative environmental factors. It should be noted that in the Tulaganov village, Firuza jamoat over an area of 800 hectares of farm land and gardens observed increase the groundwater level 3 times due to incomplete operation of the Muzbeshkent pump station which must pump out the accumulated water and discharge into Beshkent channel. This was the cause of the exit from the agricultural circulation of land and destruction of flora and fauna of the region and the salinity of the soil and water of the site.

The main problems of the environmental sphere of the region: deterioration of the general condition of the land of the region, high level of groundwater in the Firuza jamoat, lack of a centralized sewer system and wastewater treatment plants, water decontamination reagents, lack of sewage lines for sewage disposal and decontamination in the Bahor village, inefficient work on sewage treatment and networks, difficulty in managing the process of collecting and processing solid household waste of the villages, jamoats of the district, low level of environmental awareness among the population of the district, lack of modern equipment in the area to assess the real state of the environment, no administrative building of the environmental protection department and insufficient funds allocated to the field, deterioration of pistachio orchards, more frequent cases of tree cutting and poaching, the risk of emergency situations (mudflows), development of piedmont lands without considering their topography, deterioration of pasturelands, inefficient use of minerals, including limestone and marble in the area Chiluchorchashmaa of Oltinsoy village, Istiklol jamoat.

Forestry. In the framework of the “Program for the Development of Forestry of the Republic of Tajikistan for 2006-2015,” in order to raise the level of the economy and improve the ecological situation, issues of the forestry sector and its main directions are envisaged.

Table 2. Main indicators of forestry in Nosiri Khusrav district

Indicators	Measuring Unit	Square lands
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The total area of forest plantations	ha	4,000
Irrigated land	ha	58
Pastures	ha	17779
Under water	ha	259
Under the road	ha	24.59
For buildings and objects	ha	0.8

In the district, State Institution Forestry Agency of Nosiri Khusrav district manages 17,779 hectares of pastures and 58 hectares of arable irrigated land, in which orchards are created from apricot and pistachio trees. Of the 4,000 hectares of existing forests in the area, more than 3,000 hectares are made up of pistachio orchards, which have a significant impact on global climate change processes. Recently, due to the lack of control and excessive deforestation and non-restoration of trees, the state of forests is deteriorating. To prevent this situation, it is necessary to provide the population with coal in a timely manner or create a system of community use of forests. This system provides right to use forest sites for the population of nearby villages on a contractual basis. In the case of the implementation of this system, the population will be given the opportunity to use land for livestock grazing with the observance of established standards, the use of trees and dried branches and the restoration of forest by planting fast-growing trees.

Currently, the Agency has faced problems of lack of service houses for foresters in mountainous areas and the lack of special seasonal clothing, equipment and fire fighting equipment. Existing problems in the area of forestry include lack of a service house for foresters in mountainous regions and special seasonal clothing for them, lack of facilities for drying fruit and herbal medicines, lack of equipment for industry processing and fire fighting, lack of funds for building a tourist base and reviving tourism, poor development of international hunting.

4.6. SHAARTUZ DISTRICT – DOWNSTREAM OF KRB

Forestry. Environment protection policy at the local level is promoted through the district's environment protection unit. 3 highly qualified staff presently operate in this direction. Basic challenges that specialist are constantly encountering are the lack of modern laboratories, technical appliances, necessary equipment and an administrative building.

Table 3. Territories of operation of the forest management office in Shahrituz District

Indicators	Measurement unit	Land area
Total forest area	ha	22979,1
Free forest fund	ha	407
Irrigated lands	ha	27
Pasture	ha	19940,3
Forest and groove	ha	1439,9
Covered with water	ha	86,9
Covered with roads	ha	50
Covered with buildings and facilities	ha	92
Other land areas	ha	1343,1

Out of 22979,1 hectares of forests existing in the district, over 130 hectares are covered with junipers that significantly impacts on the global process of climate change. Cases of extreme cut of forests and subsequent non-rehabilitation of a number of forest trees have been observed during the recent years which is exerting negative impact on the environment. In order to prevent this

circumstance, population should be supplied with coal in a timely manner or community-based system of forest use arranged. This system foresees entrusting the forest areas to the population of nearest villages based on contract. In case of enforcing the above-mentioned system, the population will be given a chance to use lands for livestock grazing following compliance with specified norms, use of dry branches and trees and rehabilitation of forests through planting fast-growing trees.

The State Enterprise “Shahrituz District’s Forest Management Office” is engaged into forest planting, growing juniper seeds, collecting the healing herbs, harvesting of mountain berries and biotechnical activities based on budget plans. This institution employs 21 staff. It manages 22979 hectares of land, 3 residential houses, 1 vehicle and 2 trucks majority of which turned non-operational. From the 2 existing tractors only one MTZ brand tractor is operational.

Numerous activities have been undertaken to create forests during recent years and as the result, a land area worth 40 hectares in Ayvaj village were planted with saksaul, 20 hectares in Oq-Maschid areas were planted with pistachio, forest rehabilitation was ensured covering 10 hectares in Obshoron and Jura Nazarov communities (jamoats) and a new garden of fruit-bearing trees was created covering 4.5 hectares.

Setting up the processing of forest products, including hedge rose, healing plants, barberry, mountain almond and others will turn into a source of income and creation of job places within the sector, because 40 types of healing herbs grow within the district’s forests.

The district’s challenges in the forest management sector – lack of administrative building for the district’s environment protection unit, lack of service rooms for forest guards in different areas of the district and special seasonal clothes for them, lack of technical appliance to dry fruits and healing plants, shortage of specific processing equipment and fire-extinguishing tools, lack of financial resources for the construction of tourist camps and revival of tourism, undeveloped state of international hunting.

5. OVERVIEW OF LAND USE MANAGEMENT IN KAFERNIGAN RIVER BASIN

5.1. LAND USE MANAGEMENT IN FAYZABAD DISTRICT – UPSTREAM OF KRB

a. Agriculture

Faizabad district is integrated into districts of republican subordination and considered as an agrarian area. Agriculture plays an important role in the country's economy. More than 87% or 48430 of the working-age population are employed in this industry. The development of this industry is also social in nature, since 78.5% of the working-age population lives in the village and agriculture is the only source of income.

As of January 31, 2014, the total land area of the region is 87411 hectares: arable land - 7697 ha, (irrigated land - 3566 ha), perennial trees - 4341 ha, rainfed land - 53 ha, meadows - 139 ha, pastures - 50,526 hectares, household or private - 3,728 hectares, forests and shrubs - 6,829 hectares, land under water - 1,149 hectares, roads - 573 hectares, under buildings and facilities- 998 hectares and other lands - 11,378 hectares.

The district has a total of 3,566 ha of irrigated land, of which 1,785 ha are irrigated through pumping networks. Rainfed lands of the district are mainly allocated for the use of dekhkan farms, partly for household plots (presidential plots - 830 hectares). Currently, 3,050 dekhkan farms are registered in the region, where 2,100 dekhkan farms are engaged in gardening and sowing of other crops. In addition, the main garden area is located on dekhkan farms and household plots. Most of the pastures (28,564 ha) are individual farms (21,962 ha).

During 2014, 9,108 hectares overall arable land (including all forms of management, population and household plots) were fully sowed, of which 4034 hectares for grain, 747 hectares for potatoes, 529 hectares for vegetables, 21 ha for melons, industrial crops (mahsar, flax)- 631 ha, animal feed - 3146 ha.

Faizabad district has 3086 agricultural enterprises of various forms of ownership, of which 3050 dekhkan farms, 19 collective farms, 5 state subsidiary farms, 1 SUE “Seed-growing economy named after A.Nazirov and 11 auxiliary small enterprises.

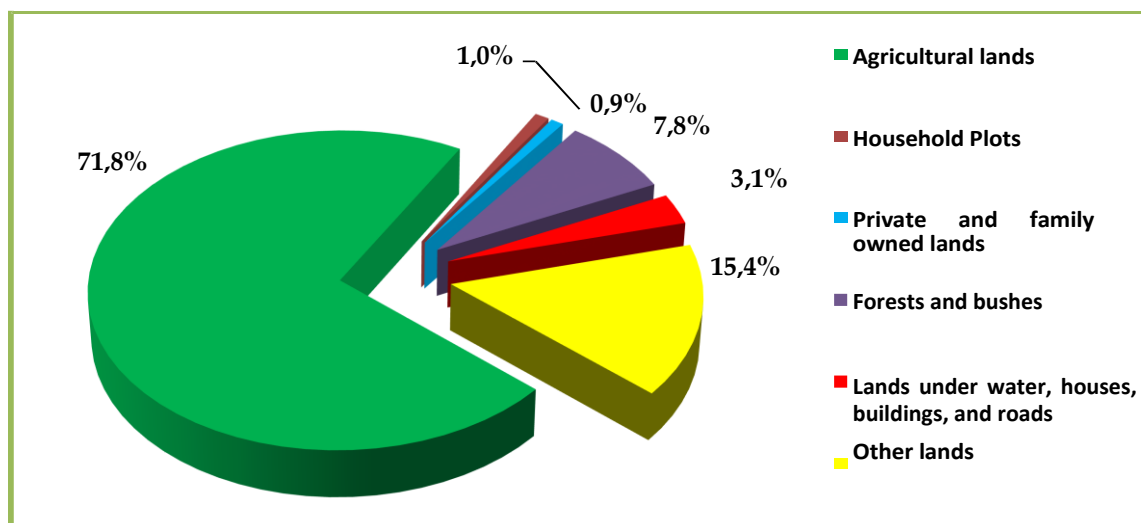
b. Land Use

According to official data, as of January 31, 2014, the total land area in the district is 87411 hectares (including 3566 hectares or 4% of irrigated land) and 9360 people are land users. Of the total area of existing land, 69585 hectares are agricultural land, 849 hectares are plots (340 hectares are irrigated), 830 hectares are private auxiliary lands, 6829 hectares are forests and

groves, 1149 hectares are under water, 573 hectares are roads and cattle driving roads, 998 hectares - land for buildings and structures, streets and squares and 11378 hectares - other lands.

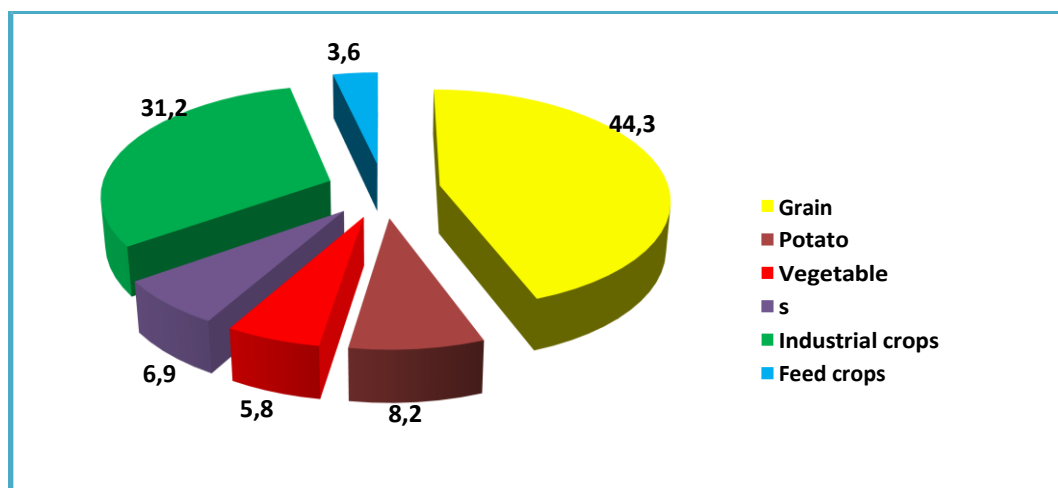
Of the total land area, perennial trees are 4341 hectares, orchards are (1603 hectares irrigated), 378 hectares are vineyards (55 hectares irrigated), mulberries are 134 hectares (110 hectares irrigated) and 3 hectares are nursery for growing seedlings (3 hectares irrigated). Arable irrigated land is mainly used for sowing potatoes, vegetables, grains, industrial crops, animal feed and growing gardens.

Figure #1. Structure of overall land use (in percentage, %)



There are opportunities to increase the volume of agricultural production using solely existing resources (land) and utilizing intensive measures (using quality seeds, mineral and organic fertilizers, establishing crop rotation, winter irrigation, introduction of modern technologies and autumn plowing). In this regard, one of the priority areas of the District Development Program include above-mentioned problems. In 2014, crops were sown on an area of 9,108 hectares, of which 6,433 hectares belong to dekhkan farms, 1,127 hectares to the public sector and 1,548 hectares to the population. In sown area by crops largely falls on cereals, potatoes and industrial crops (44.3%, 8.2% and 6.9%).

Figure 3. Land use in the context of sowing crops in 2014 (in all forms of management).



In 2014, the area of sowing crops in all types of management for each person is 0.09 hectares, which is less than 0.01 hectares compared to 2011. Since the main reason for the decline of this indicator is related to the population growth (annually an average of 4.5 thousand people) and insufficient land area (only for 5 years - 88 hectares). In addition, this caused the transfer of 53 hectares of agricultural to rainfed land.

Table number 7. Gross agricultural products by all types of management for 2009-2014 (million somoni)

List of products	2009	2010	2011	2012	2013	2014
Volume of agricultural products	78,2	101,9	123,7	159,7	180,6	201,9
Including:						
Crop production	29,9	39,3	52,5	67,0	80,8	86,7
Livestock	48,3	62,6	71,2	92,6	99,8	115,2

In 2014, the volume of total agricultural products in all forms of business in the district embedded 201.9 million somoni (at current prices), which is 11.8% more compared to 2013 and 2.5 times more compared to 2009. Indicators of each industry show an increase in gross agricultural output in monetary terms, which mainly occurs as a result of price changes. In the total, volume of agricultural products, the share of households was 38.3%, dekhkan farms - 27.1%, and the public sector (Murgi Khilol LLC) - 34.6 percent.

Various types of plant and animal products are produced in Faizabad district. As noted, the volume of agricultural production in 2014 compared to 2013 increased by 11.8%, for each person, cereals amounted to 75 kg, vegetables - 108 kg, potatoes - 142 kg, fruits - 20 kg, grapes - 2, 3 kg, gourds - 1 kg, milk - 137 liters, meat - 13 kg, eggs - 1008 pcs.

Farms in the Faizabad district mainly obtain income from the sale of agricultural products, in particular, eggs and poultry meat, cattle, small animals and milk. Regardless of the increase in the volume of agricultural products (cereals in 2014 compared to 2013, by 214 tons, potatoes - 600 tons, vegetables - 570 tons, meat - 67 tons, milk - 55 tons, eggs - 87 million pieces) incomes

of farmers during these years has declined. Produced products, except eggs and poultry meat don not meet the internal needs of the area.

The production of agricultural products has a larger share of the population in comparison to other forms of economic activity. In accordance with the forecast plan in 2018, the price and volume of agricultural production as of 2014 amounted 228.0 million somoni, of which 107.8 million somoni accounted for crop production and 120.2 million somoni for the livestock industry. The growth rate of agricultural production in 2018 is 112.9% compared to 2014.

Moreover, local specialists proposed an increase in agricultural production over the next five years within the framework of the Development Program, which is possible in case of reallocation of 1,000 hectares of pasture land in the category of arable land. Despite the fact that they are not irrigated, the soil moisture in Pechakzor, Gului zindon, hills above Duoba, Hochamard, Navobod and Hami Savra villages, rural jamoats Kalai dasht, Chashmasor, Dzhavoni, Dustmurod Ali, Miskinobod and Mehrobod is suitable for sowing of crops (grain, oats, beans, mung bean), industrial crops (flax, mahsar, sesame, sunflower) and fodder crops (clover, esparset, sulii). Since the average level of humidity in these areas ranges from 600 to 800 millilitres. The area has a moderate wind in spring and summer compared to other regions (on average from 5 to 10 meters per second).

c. Crop production

In 2014, the total volume of crop production in all categories of farms was \$ 86.7 million. The share of crop production in 2014 in the total agricultural output of the district is 43 percent(including 4566 tons of cereals, 9130 tons of vegetables, 6535 tons of potatoes, 180 tons of melons, 2194 tons of vegetables were produced).

Table 8. Production and productivity of crop production for 2009-2014.

Crops	Unit	Years						2014 г. compared 2009, %
		2009	2010	2011	2012	2013	2014	
1.Sown area	га	5384	4276	4417	4126	4269	4034	74,9
Cereals	тонна	9885	4275	4566	6236	7079	7693	73,7
Crop yeild	ц/га	18,3	10,0	10,8	15,1	16,6	18,1	98,9
2.Sown area	га	567	456	453	516	459	529	93,2
Vegetables	тонна	9039	9074	9130	10465	9884	10533	116,5
Crop yeild	ц/га	15860	198	201	202,1	215,3	199,1	125,5
3.Sown area	га	234	255	415	622	743	747	3 м
Potato	тонна	4411	5162	6535	10857	13273	13826	3 м
Crop yeild	ц/га	183,3	202	156	174,1	178,6	184,8	98,1
4.Sown area	га	25	8	15	32	6	21	84,0

Cucurbits	тонна	62	77	180	56	57	106	170,9
Crop yeild	ц/га	24,8	9,6	12	17,2	95	50,4	2 м
5. Area of gardens and vineyards	га	2377	2415	3001	3006	2835	3068	129,0
Fruits and grapes	тонна	2828	1770	2994	2646	1351	1780	62,9
Crop yeild (fruits)	ц/га	117	7,8	11,2	8,8	4,8	5,7	48,7
Crop yeild (grapes)	ц/га	11,0	3,2	6,5	6,7	4,2	6,7	60,9
6.Sown area	га	3206	3266	3133	3104	3115	3146	98,1
Feed crops	тонна	10603	10620	11592	11600	11903	13070	123,2

The analysis shows that the volume of crop production during the specified years except for melons has a tendency to grow, the yield per hectare has increased relatively. The area of sowing of melons and gourds is decreasing from year to year, the area of sowing grain, vegetables, potatoes and fruits has increased.

Grains, including wheat, are produced in the district. In 2014, 4,034 hectares were allocated for growing grain crops, 529 hectares of vegetables, 747 hectares of potatoes, 21 hectares of melons and gourds, and 3,068 hectares of vineyard. In 2014, production at agricultural enterprises increased compared to 2013, including cereals by 103.1 percent, vegetables by 106 percent, potatoes by 101 percent, and fruits by 31.7 percent. In the region, the share of dekhkan farms that grow grain is 70.0 percent.

The main reasons for the low yield of agricultural crops in comparison with the potential level:

- Development of soil salinity. Due to the reduction of funding from the budget in recent years, maintenance of pumping networks, irrigation canals and the drainage system has not been carried out. Inadequate maintenance and drainage system conditions lead to rising groundwater levels and soil salinity;
- Insufficiency or inefficient use of mineral fertilizers and other toxic chemicals;
- Non-use of the crop rotation system;
- Insufficiently developed relations between dekhkan farms and the executive body of the region.

Grain crops

The region has allocated 4034 hectares of land for sowing and growing grain products, including wheat, oats and other cereals. About 85 percent of the acreage is allocated for wheat. In the region, the share of households that grow wheat in most parts of the land is 80 percent.

In 2014, 7,293 tons of grains were produced from all categories of agricultural enterprises of the region, compared to 2013, the increase was 213 tons or 3.0 percent. And this is despite the fact that the sowing of grain was reduced by 5.5 percent compared to 2013. The increase in production was mainly due to increased yields.

According to 5-years retrospective analyzes the area of sowing vegetables and potatoes has been increased by reducing the sowing of grain. Along with sowing crops for the region, the cultivation of vegetables, melons and horticulture are also priority areas. In the past five years, the area of sowing vegetables has been increased by 1.5 times, the production of vegetable products has increased by 1.5 times, the yield by 5.0 percent. The population is mainly engaged in the cultivation of carrots, onions, tomatoes, cucumbers, onions, peppers, bell peppers, cabbage, potatoes and pumpkins, which is considered the main source of income for the majority of the population.

To provide the population with its own production and prevent price increases in the markets, an annual increase in crop production is envisaged. According to the forecast figures, during 2012-2015, the area of sowing vegetables will increase from 100 to 103 percent, production of vegetables will increase by 103 percent. In 2014, compared with 2010, the production of vegetables increased by 136%, potatoes by 140%, melons by 115%, fruits and grapes by 151%.

Compared to 2012, the crop area in 2014 did not increase due to the allocation of 480 hectares to the housing stock. Nevertheless, there is the possibility of increasing the area of sowing crops at the expense of other lands in the district.

In recent years, the lack of development of the agricultural sector of the region, in particular, livestock and crop production, is associated with the following factors:

- lack of enterprises for processing agricultural products;
- limited access of farms to loans with a low interest rate and a long maturity date;
- low level of services and poor infrastructure of farms, especially regarding irrigation water supply system and poor condition of local roads;
- debt owed by farms;
- lack of support for dekhkan initiatives to increase production.

d. Horticulture

Horticulture is one of the main branches of agriculture, which gives food to the population, increases export opportunities and provides the population with permanent work.

Fertile climate of the region provides an opportunity for the cultivation of fruits and grapes. The area for this is increasing annually due to high-yielding and intensive seedlings, fully meeting the export demands as well as population's demand for fruits.

The daily growing demand for fruits and building materials, in particular for wood (by planting non-bearing trees), requires the development of horticulture and viticulture, taking into account the favorable climatic conditions of the area. In the area there are only 4341 hectares of gardens, vineyards and mulberry trees. Only during 2010-2014, more than 712 hectares of orchards and vineyards were created in the farms of the district, which in the future makes it possible to increase the production of fruits and grapes and the development of this industry. The climatic conditions of the area are suitable for fruit production. Currently, half of the households in the

district are engaged in the cultivation of apples and pears, and in recent years they have been receiving large incomes from it.

The need for restoration of the material and technical base of the horticultural industry (the use and storage of toxic chemicals, storage, transportation and packaging of fruits and grapes) are the issues that hinder development of gardening sector the most. In addition, in recent years, the condition of most of the gardens of the area has deteriorated due to lack of agrotechnical measures, due to the aging of trees.

Table 9. Plan for the creation of orchards and vineyards for 2010-2014 (ha)

№	List of seedlings	Years					The creation of gardens and vineyards in 2014 compared with 2010
		2010	2011	2012	2013	2014	
1	Perennial Saplings (in total)	63,4	74,1	70	62,3	442	by 7 times
	Of which irrigated	4,6	5	4,3	7	130	by 32 times
2	Seeds plants	55,2	66,6	67,2	49,3	417	by 7 times
	Of which irrigated	3	4	3	4	125	by 4 times
3	Stone fruits	4,4	6,5	1,6	6,5	16	by 3 times
	Of which irrigated	-	1	-	1	2	by 2 times
4	Vineyard	3,8	1	1,3	6	7	by 2 times
	Of which irrigated	1,6	-	-	2	3	by 2 times

During the next years , it is planned to increase the area of orchards and vineyards, produce fruits and grapes as part of the “Target State Program for the Development of Horticulture and Gradually Increase Fruit Production, Growing Saplings of Fruit-Bearing and Evergreen Trees in the Republic of Tajikistan for 2007-2010” and Presidential Decree of 27 August 2009 No. 683 “On Additional Measures in the development of horticulture and viticulture in the Republic of Tajikistan for 2010-2014 ”.

Lack of specific agrotechnical measures against all insect pests has led to a decrease in productivity in recent years. Proper protection of gardens against pests and diseases can help increase yields and increase fruit production. Over the next five years, it is necessary to develop systems and toolkit for storing, packaging and exporting agricultural products by using agrotechnical, mechanical, biological and chemical innovation. This is one of the main objectives of this Program.

e. Irrigation sector

Establishing of comprehensive irrigation system and improvement of the ameliorative condition of the arable lands of the region is one of the main priorities of the agricultural sector. At present, out of 6,055 hectares of irrigated land in the region, 1,200 hectares are irrigated with the help of irrigation networks (canals and aryks, reinforced concrete trays and pumping stations). The main reason for insufficient land irrigation is depreciation of pumping stations and vertical wells in the area (due to long-term use (since 1973 of the last century), failure of water intake networks in the village of Lolagi, Buston, Dashti Marzo, Navbakhor, Fakybrod and Kangel. During the Soviet era, irrigation water was provided through a spillway of the 50th anniversary of Tajikistan 1 and 2 ascent using the 50th anniversary canal with a length of 29 km for 1,200 hectares of land in the Faizabad district from the Kafernigan river.

However, due to the deterioration and complete failure of these pumping stations, only 120 hectares of land are irrigated, which is ten times less and causes concern. It led to decrease in crop yields and efficiency of the industry, moreover it contributed to the reduction of more than 3,000 jobs. Therefore, those problem is impossible to solve with local budget. Currently, irrigated lands that are not irrigated (1080 ha) (rural hammoats of Buston, Mebrod and Vashghird) are used as rainfed lands.

Currently, the district has 58 km of main inter-farm canals, 59 km of on-farm canals and networks, 8 pumping stations, 42 units of vertical wells (16 units belong to the water management department, the remaining 26 units are dekhkan farms) 5 units of irrigation canal shuttering structures. Due to the long-term operation of equipment and facilities, more than 80% need major repairs and restoration. Total cost for repairment of the specified equipment and facilities require equal 5 million somoni. This work can be carried out only at the expense of the republican budget and international organizations.

Because of the inefficient use of land, annual loss of sowing less potatoes equal 400 thousand somoni, within 15 years of the failure of pumping stations this indicator can reach 6 million somoni.

Of the 42 units of vertical wells in the area, 26.7 percent or 12 units are currently operating, the remaining 30 units or 73.3 percent are out of service.

f. Animal husbandry

Livestock, along with other sectors, is one of the main branches of agriculture, whose share in gross agricultural production is 57 percent. In 2014, agricultural enterprises have manufactured production to the sum exceeding 115.2 million somoni, which is 108.5 percent more compared to 2013. There is more than 42,317 heads of large animals, including 2,018 cows, 98418 small animals, 1480 horses and 725954 birds.

Table 11. The volume of livestock production in 2011-2014

List of products	Units	Years	2014
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		2011	2012	2013	2014	compared to 2011 (%)
Meat on hoof	ton	1064	1410	1224	129111	121,3
Milk	ton	6440	12500	13349	13404	208,1
Eggs	thousand	86731	89131	98229	98316	113,3
Pods	ton	2	4	4	3,2	160,0
Honey	ton	51	52	56	60	117,6
Wool	ton	39	44	45	48	123,0

Table 12. The total livestock of animals in all forms of management for 2009-2014 (thousand heads)

№	Indicator	2009	2010	2011	2012	2013	2014
1.	Large animal	30818	32234	35365	36733	37871	42317
	Including cows:	14278	16009	17707	18907	19604	20018
2.	Goats and sheep	61535	70186	76985	81323	89046	98418
3.	Birds	461089	673160	769920	749385	708283	725954
4.	Horses	1624	1632	1705	1495	1444	1480
5.	Bees	3885	5513	6062	6146	6643	7022

In accordance with the official data on January 1, 2014, 42,317 heads of large animals were registered in the area. In the Faizabad district, there are opportunities for increasing the productivity of the livestock industry, organizing food supply, since 80.7 percent of the total agricultural land is pasture. The annual increase in the livestock population in the private sector could be the source for family incomes and the improvement of the population's living standards.

To increase the productivity of the livestock industry and turn it into a profitable industry following activities need to be done:

- increase the sowing area of oleaginous plants for animal feed;
- create a base of breeding animals in livestock farms in order to improve the breeding qualities of animals;
- increase the number of animals in livestock farms.

5.2. LAND USE MANAGEMENT IN VARZOB DISTRICT – UPSTREAM OF KRB

a. Agriculture

Agriculture serves as the main sector in the development of the county's economy and plays a primary role in the economic life of the district. More than half of the working population is employed in agriculture. The development of agriculture is not only economic, but also social factor of development, since 98.5% of the population, including 92% of the working-age population lives in rural areas and for most people is the only source of income. Agricultural enterprises of the district are chiefly engaged in cultivation crops, horticulture, potato, livestock, beekeeping and fish farming.

There are 5 collective farms, 1003 individual dekhkan farms, one "Dilshod B" livestock breeding farm, 5 production cooperatives ("Tajikistan", "Khamid", "Hasan D", "Karim Sharif", "Ch. Tagoev"), 9 small agricultural enterprises ("Nazar", "Luchob", "Meuroch", etc.) and one forestry in Varzob district.

Challenges of the agricultural sector:

- Lack of enterprises for processing agricultural products (fruits, vegetables, meat, milk, wool, leather);
- Lack of receiving centers for wool and leather;
- Poor quality of service provision and poor infrastructure in agriculture, especially in providing irrigated water,
- Ageing and badly maintenance of existing equipment in agriculture,
- Lack of material and technical base and the lack of modern technology
- Lack of timely provision of farms with high-quality seeds,
- High cost of fuel, mineral fertilizers, chemicals and other tariffs for services,
- Limited access to long-term loans with low interest rates in agriculture,
- Non-compliance with agrotechnical rules and lack of crop rotation system,
- Decrease in crop yields (due to the lack of seed replacement practices),
- Increase in the number of harmful insects/diseases and lack of access to iatrochemical for cultivation,
- Inadequate provision of livestock farms with vaccines and weak system of veterinary services at the jamoat level,
- Insufficient number of veterinarians and veterinary equipment,
- Lack of burial ground for cattle and special place for disinfection of dead animals,
- Lack of artificial insemination points at the jamoat level,
- Lack of professional knowledge among managers of dekhkan farms (more than 71% of them do not have work experience and agricultural education, 15% have no management experience, and 22% do not have well-established accounting records).
- Deterioration of land and failure of water distribution systems the Karagaz and Shurtugai area, need for restoration of water supply system in Luchob jamoat,
- Limited funding options for livestock priority areas,
- Lack of necessary fish-basin,
- Difficult processing of rainfed lands,

- Low level of labor capacity in agricultural enterprises,
- Lack of reliable markets for agricultural enterprises.

b. Land use

The total area of agricultural land is 163,133 hectares, including 260 hectares or 0.15% of irrigated land. The total area of sown land is 2.2% or 3528 ha, including 800 ha of presidential parcels, perennial fruiting trees - 0.18% (309 ha), vineyards - 0.23% (383 ha), mulberry trees - 0.03 % (51 ha), rainfed land - 0.01% (26 ha), other types of perennial trees (walnut orchards) - 0.01% (19 ha) and meadows - 0.18% (299 ha) as at 1 January 2014. The main part of agricultural land is pasture 41.6% (67811 ha).

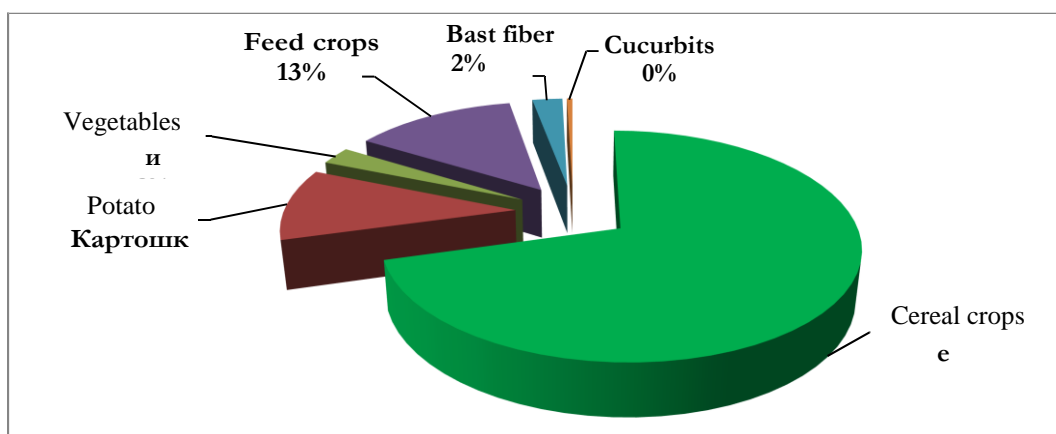
Table 4. Structure of land use in Varzob district

№	Land use	Administrative territory of district, ha	Outside administrative territory of district, ha
1.	Total agricultural land	163133	82760
	Including irrigated	260	610
2.	Arable land	2276	2728
	Including irrigated	74	395
3.	Perennial fruit-breeding trees (gardens)	309	-
	Including irrigated	1	-
4.	Vineyard	383	-
	Including irrigated	1	-
5.	Mulberry	51	-
	Including irrigated	3	-
6.	Nursery garden	1	-
7.	Other species of perennial trees (walnut orchards)	18	-
8.	Shrubbery	0	197
	Including irrigated	0	197
9.	Meadow	299	-
10.	Pature	67811	46797
11.	Household plot	2206	-
	Including irrigated	181	-
12.	Private agricultural farms (presidential sites)	800	-
13.	Forests and groves	8176	-
14.	Shrubbery	2326	-
15.	Land under water	705	-
16.	Cattle paths	436	221
17.	Building land and space	1071	249
18.	Other lands	76265	28534

In 2014, according to statistics, 4,748 hectares of the area were allocated to sown, including cereals of 2,696 hectares, potatoes - 271 hectares, vegetables - 257 hectares, and fodder for animals - 556 hectares. During the period, 3% of arable land was not sown due to late processing. In the case of using this area of land, the district will be able to increase production and generate additional income.

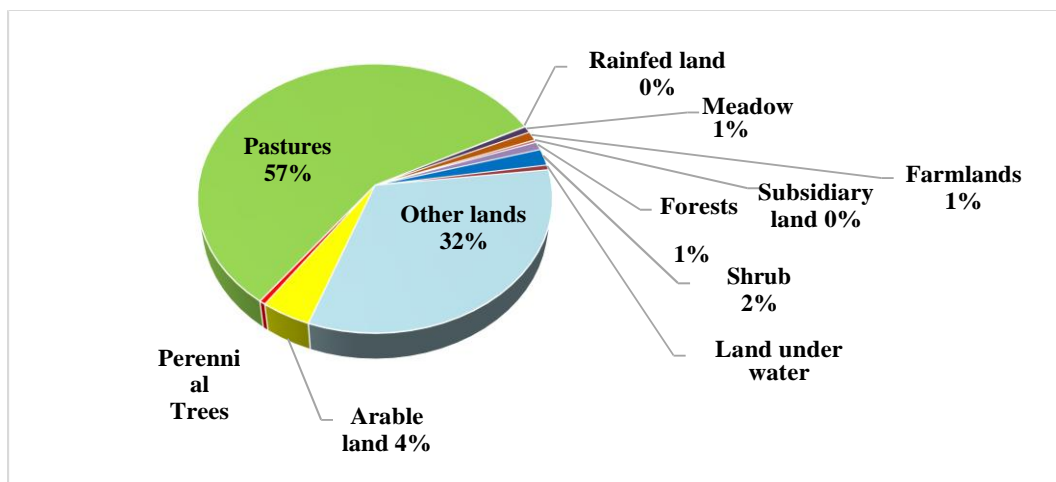
Of the total agricultural land, 1.07 percent (457.18 hectares, including 195.9 hectares of irrigated land) are household plots, 0.75 percent (138 hectares, including 1 hectare of irrigated land) are subsistence farms and 32.2 percent (13,720.32 ha) other lands. Potatoes, vegetables, grains and animal feed are grown on irrigated land.

Figure 1. Land use in Varzob district by types of crops in 2014 (in %).



There is 26 hectares of rainfed lands in the district. The integration of these lands in agricultural use is considered one of the priority tasks for the development of the agricultural sector

Figure 2. Structure of total land use in Varzob district in 2013 (in %).



Arable irrigated land is mainly used for planting potatoes, vegetables, grains and forage crops for animals. Of the total area of arable land of the district, 67 percent is in dekhkan farms (1,756.7

ha) and 33 percent in households. Terrace method of agriculture should be applied where is possible for land reclamation. According to agrotechnical and environmental requirements, land with a slope of more than 20% should be used to create gardens, vineyards, and forest plantations.

Recent studies about current state of the soil quality in Varzob district state the high level of erosion processes at the area. Causes of erosion related to natural and anthropogenic processes, such as the flat wash on arable land, agricultural degradation, degradation of pastures, which covered almost the entire territory of dry land and mountain pastures. The fertile soil layer is currently under process of gradual destruction, which leads to decrease of the productivity of the washed-off land.

c. Crop production

In 2014 the total volume of crop production in all categories exceeded the sum in 39,810 thousand somon, which is 7.4% more than in 2012. The share of crop production in 2012 from the total agricultural output of the district was 88.9 percent.

Table 5. Crop production in Varzob district

№	Crop production	Unit	2012	2013	2014
1	Total amount of crops	ton	2312	2676	2664
	crop yeild	Center per 1 ha	8	8,9	9,9
2	Vegetables	ton	1721	1487	1193
	crop yeild	Center per 1 ha	44,1	41,6	47,3
3	Potato	ton	2628	3189	2259
	crop yeild	Center per 1 ha	95,9	105,6	83,4
4	Fruits	ton	1308	1495	1422
	crop yeild	Center per 1 ha	21,5	26,3	27,3
5	Vineyard	ton	885	1109	1288
	crop yeild	Center per 1 ha	26,5	28,9	34,5
6	Cucurbits crop	ton	114	234	256
	crop yeild	Center per 1 ha	57	58,5	34,6
7	Feeding crops	ton	9160	9353	9256
		Center per 1 ha	31,3	47,7	30,1

Horticulture and viticulture as well as mentioned above are part of the main branches of agriculture that provide food, export capacity and permanent job in the district. Favorable weather conditions of the region allow annual increase of orchards and vineyards due to high-yielding and intensive seedlings, resulting in meeting the population's demand for fruits and vegetables and export at the same time. Nevertheless, the growing demand for fruit and grapes requires the development of horticulture and viticulture in the future. Only in 2006-2011 282 hectares of new farms and vineyards were created, which will support increase of the production fruits and grapes as well as further develop this industry.

The main obstacles for development of horticulture and viticulture are need for restoration of the material and technical base of the industry, establishment of storage system and processing of fruits and grapes. In recent years, most of the gardens and vineyards of the area have deteriorated due to the lack of agrotechnical measures, lack of chemical treatment against diseases and insects and high cost of prices of toxic chemical. The main reason for the decrease in yield is the spread of various fungal diseases and an increase in the number of insect pests. The main reasons for the decrease in yield are the spread of various fungal diseases and an increase in the number of insect pests. The peak period of growth in the number of diseases and the multiplication of insect pests vary depending on the biological features and climatic condition. Therefore, it is important to establish special system that would predict the peak period and take responsibilities for plant restoration.

d. Irrigation water supply

Irrigation of new lands and improvement of their ameliorative state are extremely important for increasing agricultural production and providing the population with jobs. Unfortunately, there is still no organization for supporting irrigation system in the Varzob district. There is no Department of Land Reclamation and Irrigation, which should be next task in the field of agriculture. Another problem is the deterioration of land conditions due to the lack of a crop rotation system and non-compliance with agrotechnical rules. None of the sites has an agrochemical map.

To improve access to water resources in the region, it is necessary to create at least Water Users Association (WUA), which does not exist now. Recently, there has been a worsening of the ameliorative state of the land in the area due to the untimely cleaning of 18 km of on-farm canals, not carrying out repairs to water supply facilities, and the lack of modern technology, spare equipments and financial resources.

There are 27 units of inter-farm canals with a length of 113.5 km for irrigation of agricultural land in the area. The main source of land irrigation are mountain rivers and springs, which annually fill canals with sand during the irrigation season. Some of them are cleaned twice a year, which results in additional funding. It should be noted that in the Varzob district, the technical condition of the existing canals and siphons does not meet the requirements and requires constant repair and restoration.

The future development of agriculture in the region is associated with the reconstruction of irrigation networks, the creation of new pumping stations on the Sayod (Shurtugay) site for irrigating over 200 hectares of new land and introducing them into agricultural use.

Another barrier in efficient work of irrigation water supply is delay in river bank protection works due to insufficient funds. As a result of the increase in the level of the rivers in the precipitation and flood season in 2012-2014, more than 3.1 hectares of trees and gardens in the villages of Luchob and Chorbog were destroyed. To reduce the risk of washing away of arable land, in the area there was a need for shore protection operations with a total length of 12.6 km. Total cost of reconstruction was 4.6 million somoni. Reconstruction works included pulling the

wire and filling it with stone and gravel. These measures should protect 65 hectares of land from the threat of flushing. In the villages of Luchob, Kosatarosh, Kharangon, Sayoed, in the season of raising the water level in the rivers, there is still a threat of a breakthrough of the existing canals.

One of the main reasons for the untimely cleaning of canals is the lack of a responsible agency in the field of irrigation, deterioration of technical equipment, lack of fuel and high prices for it. For the last three years local governments did not allocate any budget to eliminate the existing problems of the industry.

There are 17.8 km of inter-farm canals (13.2 km is in unsatisfactory condition) and 14.8 km of on-farm canals (11.4 km is in unsatisfactory condition). Currently, more than 86.3 percent of the channels need to be cleaned and repaired. As a result of the delayed cleaning of irrigation facilities, the ameliorative condition of 87.2 ha of land may deteriorate. At the same time, inter-farm hydraulic structures consist of 61 units, most of which were built in 1956-1964, currently 78.5 percent are worn out and need to be repaired and repaired.

e. Animal husbandry

Along with other sectors, livestock farming is one of the main sectors of agriculture, whose share in the gross agricultural product is 56 percent. In 2014, agricultural enterprises produced products in the amount of 50.9 million somoni, which is by 2058 thousand somoni more than in 2013.

There are more than 19,004 thousand heads of large animals, including 13.3 thousand cows, 75.6 thousand heads of small ruminants, 225 heads of horses and 18.1 thousand heads of birds according to the data on the registration of private farms in the area. However, the increase in the number of animals and the production of animal products do not exceed the existing demand. The annual increase in the number of animals is significant, and in 2014 compared with 2012, the number of large animals increased by 4,671 heads or 75.4%; small ruminants for 35671 animals, 52.8%; birds for 5320 heads or 70.6% and horses for 76 goals or 66.2%.

Without increasing the productivity of the livestock industry and creating a forage base, an increase in livestock production in the area is considered impossible. Without increase in the livestock population in the private sector and the non-functioning of livestock spheres from day to day limits has led to a reduction in the profitability of the livestock industry in agricultural enterprises and the decrease in the livestock population. 69 percent of the animal and bird's sale occurs through the private farms. In the region, 47 percent of private farms sell cattle and 32 percent of farms sell small cattle.

In the current conditions of the agricultural industry one of the necessary directions is the development of horse breeding for the local population. According to statistics, in 2014, only 225 heads of horses are reared in all forms of management. The Varzob district has good conditions for the development of the livestock industry and the organization of food supply, since the total area of pastures is 67811 hectares, which is 41.6% of the total agricultural land.

In order to improve the development of the industry, it is necessary to take the following measures: increasing and enriching the sowing area and strengthening the food base, increasing the livestock of breeding animals, conducting public awareness campaigns to improve the breeding qualities of private animals, timely carrying out the necessary activities related to prevention of diseases among animals, etc.

The main factors for the development of the livestock industry of the district:

- increase and enrichment of land for planting forage crops;
- increase in sowing oil crops in farms for animal feed;
- the organization of the base of breeding animals in livestock farms to improve the breeding qualities of animals;
- providing winter and summer pastures;
- an increase in the livestock of animals in farms that have reduced livestock and the establishment of artificial insemination of animals.

f. Fish farming

Fish farming is one of the new and profitable industries for the area. In accordance with the Resolution of the Government of the Republic of Tajikistan dated from October 31, 2005, №396 “On approval of the Program for the development of fish farming in the Republic of Tajikistan for 2009-2015”, Varzob district in 2012 organized 4 ponds for fish farming in Dehmalik Jamoat, which laid the foundation for further development of fish farming in 2013–2014. In 2014, 4.4 tons of fish were produced in the region, which is by 0.7 tons more than in 2012. At the same time, people engaged in fish farming face a number of problems, which, first of all, are related to the lack of fry and fish food needed for breeding and increase of production.

g. Beekeeping

Along with crop production, animal husbandry and fish farming, beekeeping also occupies a special place. Beekeeping and honey production are considered a low-cost and profitable branch of agriculture. Climatic conditions of Varzob district are very suitable for honey production and development of beekeeping. Existing reserves of nectar plants allow increasing bee colonies and doubling the production. In 2014, 230 beekeepers of the Varzob district contained 3509 bee colonies in beekeeping farms. Honey production from 41 tons in 2012 was increased up to 62 tons in 2014. Since 2000 for the purpose of sustaining beekeeping industry, an association of beekeeping was organized (it has 230 beekeepers, and the number of bee colonies reached 3509 units) which assisted in solving some problems, including the neutralization of infectious diseases, provision of necessary materials to beekeepers as well as sale and purchase of manufactured products.

For greater development of beekeeping, the support of beekeeping farms and provision of long-term loans with low interest rates is considered expedient. Promoting the development of

beekeeping industry is considered one of the main priorities of agricultural development at the national level. On this basis, an annual increase in the number of bee colonies and the volume of honey production is envisaged.

h. Forestry

The enterprise “The Forestry Plot of Varzob District” deals with issues of protection, maintenance and creation of new forests. The company has 4 full-time employees (1 inspector and 3 foresters), also 12 seasonal workers. Up to 2.2 tons of dry fruits, 1.4 tons of nuts, 11.1 tons of animal feed, 2.7 tons of wild rose, and more than 394 m³ of firewood are produced and exported for sale in the district’s forestry annually. The total area of forests and groves of Varzob district is 8176 hectares. Apple trees, apricots, willow, poplar, arr, dogrose, walnut and almonds mainly grow in the forests of Varzob region. As part of the “Forestry Development Program of the Republic of Tajikistan”, it is planned to consider and resolve important issues of forestry and its main areas in order to improve the level of the economy and improve the state of the environment. In accordance with this Program, on the territory of the region, with the aim of creating forests, 110 hectares in Luchob, S. Ayni and Varzob Kala jamoats were supplied for growing saplings of shady trees and increasing the forest area, as well as producing construction materials. The main problem of the industry is the lack of equipment and plant for processing rose hips, fruits, nuts and honey in the forestry of the region.

Favourable natural and climatic conditions of Varzob region contribute to the development of gardening and expanding the area of orchards, applying the method of intensive orchards and high-yielding tree species such as figs, pomegranate, tropical fruits, persimmon, apple, apricot, plum, cherry and sweet cherry and ensure export and the implementation of most of the harvest. During 2012-2014 more than 41 hectares of fruit and shady trees have been created in the farms. Since Varzob region does not have a fruit processing plant, a significant amount of the crop is spoiled and used as animal feed, which causes enormous financial loss to horticultural farms. In the near future, establishment of a dry fruit reception center and construction of a small processing workshop for fruits and vegetables in the district center and rural jamoats will be one of the main priorities of the Varzob district development program. Based on scientific achievements, the establishment of protection of gardens to fight diseases and pests will lead to increased yields and fruit production. In this regard, an important area of the Varzob District Midterm Development Program is the protection and maintenance, as well as processing of agricultural products by mobilizing funds from all possible sources.

5.3. LAND USE MANAGEMENT IN VAHDAT DISTRICT – UPSTREAM OF KRB

Vahdat is a agrarian industry city, and the agrarian sector plays an important role in the city's economic life. There are more than half of the able-bodied population work in agriculture. Agricultural development is not only a matter of economic, but also has social character, as 87.2% of the able-bodied population (145,000 people) live in rural areas. In January 1, 2015, the total area of agricultural land is 141858 ha, of which 13661 hectares of arable lands, 3949 hectares of perennial trees, 123761 hectares of pastures, and rain-fed lands 255 hectares. There

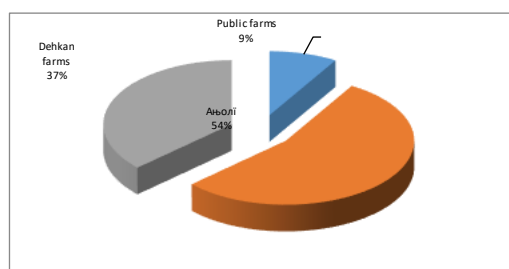
are only 14723 ha irrigated land in the district. Rain-fed lands are primarily used for the use of dehqan farms and partially garden plots. At the same time, there are 80 dehqan farms in the district that are engaged in planting of the garden.

Table 5. Overview of land use in Vahdat district.

#	Land use	Area, ha
	Number of land users (person)	
1	General area of lands	367400
1.1.	Including irrigated lands	14664
2.	Arable lands	13661
2.1.	Including irrigated lands	10132
3.	Perennial trees	3949
3.1	Including irrigated ones	1482
3.2.	Gardens	2186
	Including irrigated ones	867
3.3.	Vineyard	1432
	Including irrigated ones	305
3.4.	Mulberry gardens (all of them are irrigated)	312
	Including irrigated ones	295
3.5.	Citrus	19
	Including irrigated ones	15
3.6.	Trees, places for growing seedlings (all of them are irrigated)	
4.	Rain-fed lands	255
4.1.	Including irrigated ones	232
5.	Hayfields	
6.	Pasture	123761
5.1.	Including summer pastures	90036
5.2.	Spring and autumn pastures	33726
	Total agricultural lands:	141627
	Including irrigated ones	11846
	Number of households	
1.	Household lands:	5540
	Including irrigated ones	2544
1.2.	Arable lands	2784
	Including irrigated ones	1385
1.3.	Perennial fruit trees	1818
	Including irrigated ones	1059
1.4.	Buildings and other lands	938
2.	Farm or private lands (all of them are irrigated ones)	956
2.1	Including irrigated ones	204
3.	Forest and boscaje:	21184

3.1.	Including trees field	21093
3.2.	Bare field	3
3.4.	Seedlings nursery plot	
3.4.	Forests for protection of crop lands	86
3.5.	Other protective trees	2
	Including, irrigated ones	
4.	Bush	15160
5.	Marshlands	9
6.	Underwater lands:	5982
6.1	Including rivers, small rivers	4434
6.2.	Lakes and seas	8
6.3.	Water reservirs and pools	20
6.4.	Canals, ditches and drains	1520
7.	Roads and livestock pathways	1200
8.	Lands of buildings and facilities, streets and squares	2798
9.	Other lands:	172945
9.1.	Sandy lands	585
9.2.	Ravines	582
9.3.	Landslide and pebblestone	157754
9.4.	Glaciers	8810
9.5.	Other lands not used in agriculture	5214

Figure 3. Share of households in agricultural production.



The analysis shows that the share of agricultural products in urban and rural areas in total agricultural output has a growing tendency in the country, with an average of 3.6 percent. The source of farms income in Vahdat is mainly based on the following indicators: (1) Income from sale of agricultural products; (2) Income from sale of animal and poultry; and (3) Non-agricultural incomes (permanent work in

collective farms, work on contract, seasonal work, trade, income from remittances, government agencies, etc.).

Crop production. In 2014, the total volume of crop production in all categories of farms was 370897 thousand somoni, compared to 2010 in the amount of 27 percent. The share of plant-growing products in 2014 constitutes 57.9 percent of the total agricultural products of the district.

Cotton production. For cotton cultivation, 11,4 percent of arable land is used. Since 2000, its profitability has been gradually decreased and production and sales of cotton have been faced with problems. In 2014, cotton production has made 1301 tonnes, which is 3114 tons less compared to 2011. Therefore, it is expected to increase vegetable crops from cotton lands in farms.

Vegetables. Over the past years, the growth of vegetable and potato production is increasing, and its production has increased to 97.8 thousand tonnes in 2014, compared to 5.7 percent in 2010. The increase in vegetable production happened due to expansion of lands (intensive).

Despite the fact that agricultural indicators have been growing since 2010, however, there are still reasons that have negative impact on increase in agricultural productivity, including:

- not considering the opportunities of agricultural farms to plan, produce, process, and sell cotton and its products;
- non-operating enterprises for processing of agricultural products and limited availability of farms to low rate and long-term loans;
- lack of services and bad condition of infrastructure in farms, especially in insufficient water supply systems and local roads;
- indebtedness of the majority of dehkan farms;
- lack of support for the decision of farmers to produce products.

Garden and vine growing play a special role in promoting the export potential of the district and providing permanent employment to the population. The favorable climate of the region creates opportunities for the growing of fruit trees. In 2010-2014, according to the Decree of the President of the Republic of Tajikistan dated August 27, 2009? No.683 "On Additional Measures on the Development of Gardening and Vine Growing in the Republic of Tajikistan for 2010-2014" there has been planted more than 467 gardens and vineyards in the district farms, which is 4 times higher than the indicators of this Program.

In 2014, in rural and urban areas, 144 hectares of new gardens and vineyards were planted. Problems that pose obstacles in gardening and vine growing are first of all restoring the material and technical base of gardening and vine growing (the use and storage of pesticides, storage and transportation of fruits and grapes).

In recent years, many gardens of the district have been destroyed due to lack of agro-technical measures. The main reason for the decline in yield is the spread of various fungus diseases and the increase in the number of pests. The duration of diseases and pests is different depending on the local climate conditions and their biological characteristics, which damage the growth of the

trees. Therefore, in this area, it is necessary to set up a special group to fight against spread of insects in the region and to restore the plant protection stations.

Livestock breeding: This area, along with other sectors is one of the main agricultural areas of the district, its specific share in the range of agricultural products amounted to 42.1 percent. In 2014, agricultural farms have produced the product for 640.1 million somoni, which is 62.2 percent more than 2010.

Acceleration of livestock development is primarily focused on the area of pedigree livestock farming in order to ensure food security and reduce poverty. The use of pure-bred livestock, zootechnic and veterinary services is limited and the supply of fodder/feeding stuff and its stock is decreased. In the future, it is necessary to focus on the possibilities and resources to improve the quality and productivity of livestock through realization of selection and pure-bred livestock works. Furthermore, rehabilitation of livestock artificial fecundation points and stations and their supply with pure-bred materials (high breed livestock) is a key target for the Jamoats.

In 2014, there were more than 78854 heads of large cattle in private farms of the district, including 44326 heads of cows, 150348 heads of goats and sheep, 1146 heads of horses and 452061 poultry. However, the growth of heads and production of livestock products does not meet modern requirements, while using the existing district's potential, we can increase its growth.

Table 6. The total number of animals and poultry in all economic forms (heads).

#	Indicators	2011	2012	2013	2014
1	Large cattle	72959	77127	78505	78854
2	Goats and sheep	124145	141889	145871	150348
3	Horse	1070	1057	1129	1146
4	Poultry	340649	371273	395276	452061
5	Honey-bee colony	11952	13518	14466	14674

The table above shows the significant growth of cattle heads. In 2014, compared to 2011 and 2012, large cattle were 8 percent and 2,2 percent; goat and sheep were 21.1 percent and 5.9 percent, poultry – 32.7 percent and 21.7 percent; honey-bee colony increased by 22.7 percent and 8.5 percent respectively. In rural and urban areas, 46.5 percent of livestock and poultry belong to households.

In urban and rural areas, there are good conditions for livestock breeding and the establishment of a fodder, as well as livestock development, because of the 33.7 percent of the total area of agricultural lands are pastures (123762 hectares). Indeed, the climatic conditions of the city are suitable for livestock and poultry production. In case of processing of livestock products it is possible to provide Dushanbe and other neighboring regions with milk products.

To increase the productivity of livestock and to transform it into profitable sector the following are needed:

- to increase the area of oil plants cultivation in farms for fodder;
- to establish a basis of pure-bred animals in livestock farms for livestock breeding.

In the recent years, the beekeeping has been developing in the cities and villages and the beekeepers association has been formed. The association includes 55 beekeepers, and the number of bee families increased to 14674. In 2014, more than 228.7 tons of honey was produced in the district. For the development of this sector, the financial support of beekeeping farms is necessary.

Poultry breeding. The introduction of poultry breeding can double the profitability of farms and provide the domestic market with eggs and meat. At present the number of poultry in all farms of the district is 452061. In order to further develop the industry, it is necessary to restore the poultry farm LLC “Navruz” in the villages Jamaat of Bahor and LLC “Chirtak” in the villages Jamaat Bozorboy Burunov.

Problems of the sector:

- wear of existing equipment in dehkan farms and absence of material and technical base;
- erosion, degradation of cultivated lands and reduced productivity;
- inadequacy of the water distribution systems and their failure to operate as before;
- low prices for dehkan farms products and high prices for production resources and services;
- limited access to low rate and long-term loans especially in the gardening and livestock sector;
- the deterioration of land condition and the necessity of their reclamation;
- wear of irrigation system (due to non-operability of pumps and restoring them);
- failure to timely provide fuels, pesticides and other mineral fertilizers and their low effect;
- new varieties of products and seeds;
- lack of points of reception and processing;
- lack of qualified specialists due to low living standards in rural areas and low wages;
- lack of supply with modern techniques and equipment;
- lack of artificial fecundation at the Jamaats level;
- lack of special slaughter places and special pits for disinfection of cattle wastes.

5.4. LAND USE MANAGEMENT IN QABODIYON DISTRICT – DOWNSTREAM OF KRB

a. Agriculture

Agriculture is considered one of the priority spheres of the national economy, its role in the development of the district economy and food security is highly valued. The district specializes in the production of cotton, grain, vegetables, potatoes, melons, fodder for animals, horticulture, breeding of silkworms, animal husbandry and beekeeping. Commercial crops include cotton, sesame and cereals, corn for seeds, and peanuts. The population of the district receives the bulk of its income through the sale of vegetables, melons and fruits.

The main agricultural producers in the area are households, dekhkan farms and production cooperatives. Agricultural enterprises account for the largest share in the total volume of agricultural production of cotton, while the production of potatoes, fruits, milk, meat, eggs, cocoons and wool belongs to households.

In 2014, the volume of agricultural production of the district in the region was 5.8%, by following products: cereals - 4.1%, melons and gourds - 9.7%, vegetables - 5.9%, potatoes - 5.7%, vegetables - 2.5%, grapes - 4, 3%, milk - 6.3%, meat - 6%, eggs - 4.3%, honey - 1.5%, fish - 1%, cocoons - 10.8% and wool - 10.5%.

According to official data, compared to other districts of the region, the level of productivity in the district is lower. The reason for this is the poor ameliorative condition of the land, the high level of groundwater and depreciation of pumping stations.

The main goal of the sector in the coming years is to improve irrigation water supply amelioration of abandoned lands.

Agriculture Management System. As of January 1, 2015, the following farms are operating in the district: 1 farm for breeding animals, 1 farm for growing seedlings, 1 forestry agency, 1 cooperative seed farm, 1913 units of production cooperative and individual dekhkan farms and 22610 household farms.

b. Land use structure

According to official data as of January 1, 2015, the total land area of the district is 1,84763 hectares, the number of registered land users is 1920 people. The area of land suitable for use by farms is 108583 ha (of which 19409 ha are irrigated), 5191 are personal plots, 1543 ha are private auxiliary lands (1543 ha are irrigated), 13211 ha are forests, 4214 ha are shrubs, 118 ha - marshy land, 4388 ha - land under water, 1602 ha - roads and cattle roads, 1473 ha - land for buildings and structures, streets and squares, and 44,440 ha - other lands.

Of the total land area, perennial trees (orchards) cover an area of 2,370 hectares (1,497 hectares irrigated), 418 hectares are vineyards, 345 hectares are mulberry trees, 259 hectares are citrus and subtropical trees.

Table 7. Land use structure.

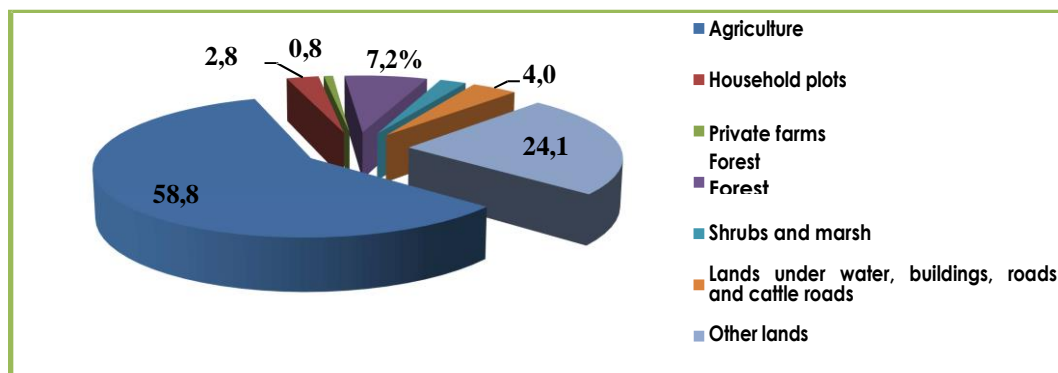
No	Category	Ha
1	Agriculture land (including pastures)	108,583
	Including irrigated	23,961
2	Household landplots	5,191
3	Private farm lands	1,543
	Including irrigated	1,543
4	Forest	13,211
5	Land under water	4,388

6	Roads and cattle roads	1,602
7	Land for buildings and structures, streets and squares,	1,473
8	Shrubs	4,214
9	Marsh land	118
10	Other land	44,440
	Total:	184763

Arable irrigated land is mainly used for sowing cotton, potatoes, vegetables, melons, grains and fodder crops for animals. Arable land is generally irrigated at 100%, and this factor contributes to a good harvest. However, there is a problem with regular water supply, in particular during the main growth of plants, when water is supplied by gravity. This procedure in turn leads to many technical and financial problems. Payment for water supply services and electricity used in the operation of pumping stations is not timely effected, and this has a negative impact on the provision of water supply services.

Non-agricultural land is 76180 hectares or 41.2% of the total rainfed land. For the development of agriculture, in particular the development of animal husbandry, there are 13,211 hectares of forests in the district, of which 117 hectares or 0.9% are irrigated, which in the near future should be used more efficiently as part of the district development program.

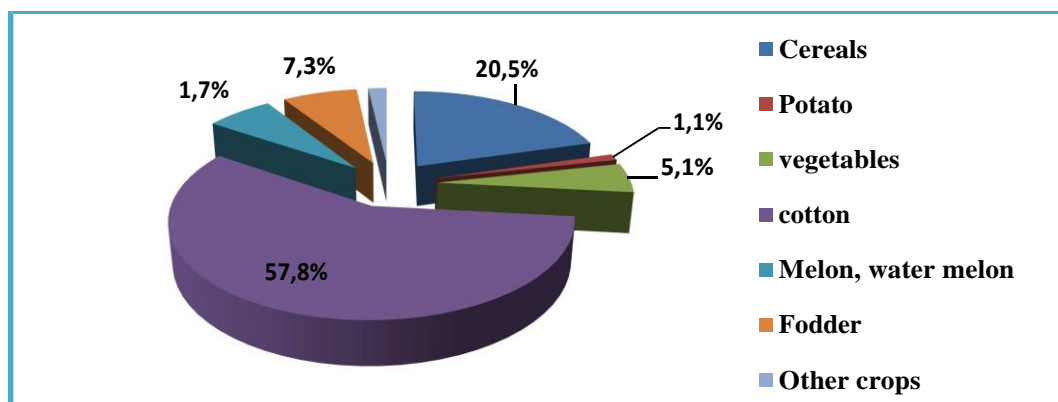
Figure 4. Structure of total use of agricultural land (in %)



The area of other lands is 44,440 hectares, which are mostly barren, and accordingly make up 58.3% of rainfed land. The use of part of these lands is envisaged during 2016–2020 under construction, and this could be one of the sources of replenishment of the district budget. In 2014, taking into account the crop area, the largest share is cotton sowing - 57.8%, cereals - 20.5 % and other crops - 21.7 %.

In recent years, the area of land allocated for cotton sowing and fodder crops has decreased, and the total area of orchards, grain, vegetables and melons has increased.

Figure 5. Land use in the context of sowing crops for 2014 (in all forms of land management)



The role of agriculture in the local economy. The agriculture in Kubodiyon is an important source of supplying the district’s population with food, jobs and income. In the region, 82% of the working-age population (22,100 people, of which 70% are women) are employed in the agricultural sector.

The total volume of agricultural production in 2014 amounted in 636.3 million somoni, which is 70% of the total production. According to official statistics in the field of agriculture, 42% of the population is employed (mainly in horticulture, vegetable growing and cultivation of melons and gourds). At the same time, 88% of the share of crop products falls on the private sector (individual dekhkan farms, households and auxiliary lands), the share of collective farms was 12%.

The analysis shows that the increase in the volume of agricultural production is mainly achieved by increasing the area under crops, although in some cases the growth in production is achieved by increasing the yield in the field of horticulture, vegetable growing and the cultivation of melon crops.

c. Crop production

Crop production is considered one of the most profitable sectors of the district. From this point of view, special attention is paid annually to the development of this sector of agriculture.

Table 8. Crop production indicators (ton)

Indicators	Year				2014 in compare to 2011 (in %)
	2011	2012	2013	2014	
Cereals	33113	36252	39370	34097	103
Vegetables	40536	41306	46823	50015	123,4
Melons and watermelons	37105	33729	41071	41072	110,7
Potato	13795	14355	16741	12941	93,8

Fruits	3055	3130	3131	3433	112,4
Grapes	3699	3781	3784	3787	102,4
Fodder	16918	22447	18223	19717	116,5
Technical crops	15633	17600	17000	17240	110,3

During this period, the district produced 34097 tons of wheat, 17240 tons of cotton, 50015 tons of vegetables, 12941 tons of potatoes, 41072 tons of melons, 3433 tons of fruits, 3787 tons of grapes. The district produces grain products, including wheat. In the structure of the sowing area, sowing cotton dominates. In 2015, 57% was allocated for the cultivation of cotton and 22.8 percent of the sown area was cultivated under grain crops.

d. Horticulture

In the framework of the “Target State Program of Horticulture and Viticulture and the Growing of Shady and Fruit Trees in the Republic of Tajikistan until 2014”, more than 1,100 hectares of new gardens were created in the district. In the future, this will contribute to increase in fruit production by 10,000 tons (according to the yield of 15-20 centner \ ha).

Out of 3470 hectares of the total area of perennial trees, 360 hectares are vineyards. Perennial trees form a total of 1700 hectares of household plots. The main problem that has a negative impact on the development of horticulture and vegetable growing, which leads to the loss of products is high prices for fuels and lubricants and toxic chemicals and lack of measures to combat pests, limited market, equipment depreciation at existing processing plants, lack of information and consulting support, poor melioration condition of gardens, lack of technology for processing and drying fruits and vegetables.

In the district there are no organizations that provides information and consulting services. Consultations on agricultural issues are provided by experts of existing associations, which do not meet modern requirements. Another important factor that has a direct impact on the development of agriculture is the low level of access of farms to concessional and long-term loans.

e. Animal husbandry

Along with others, this sector is one of the main spheres of agriculture, its share in the gross agricultural production of the region is 31.9 %. In 2014, livestock farms of the district produced products equivalent to 203.2 million somoni.

Table 9. The volume of livestock production for 2011-2014.

Item	Unit	Year				2014 in compare to 2011 (in %)
		2011	2012	2013	2014	

Meat	Ton	4554	4945	5415	6250	137
Milk	Ton	19745	21308	23440	25720	130
Eggs	Thousand	1917	1991	2428	2597	135
Cocoons	Ton	44,7	45	52,0	38,8	87
Honey	Ton	10,2	10,6	13,3	13,3	130
Wool	Ton	421	426	464	470,4	112
Fish	Ton	-	-	17,2	15,4	

One of the priorities of the development of livestock breeding, according to forecasts of the sector development until 2020, is a gradual increase in production. According to official statistics as of January 1, 2015, only 41022 heads of large animals are registered in the district, out of which 22805 are cows. Increasing the number of livestock is one of the main objectives of the development of the sector for the period up to 2020, which is aimed at ensuring food security.

In general, only households are dealing with sell of cows, sheep, and goats. In Kubodiyon district, there are animals breeding farms are operating. There are 3 stations of artificial insemination in rural jamoats, which are not currently working. The district has a good conditions for the development of the livestock husbandry and fodder supply (48.3% of the total agricultural land is pasture - 89224 hectares) and all the livestock farms in the district are provided with winter pastures.

Table 10. Number of livestock for 2012-2014

Indicator	Year								
	2012			2013			2014		
	Total	Dekhkan farms	Household farms	Total	Dekhkan farms	Household farms	Total	Dekhkan farms	Household farms
Big cattle	40613	1693	38920	40636	1697	38939	41022	1719	39303
Including cows	22560	427	22133	22577	444	22133	22805	464	22341
Small cattle	83668	17965	65703	85763	20555	65208	90803	22076	67727
Horses	1178	30	1148	1178	30	1148	1219	30	1189
Birds	74695	3137	71558	74705	3147	71558	75715	3154	72561
Bee hives	554	67	487	658	70	588	728	70	658

The main problem of livestock farms is the lack of small enterprises for the processing of dairy products. The creation of enterprises for the processing of dairy products and wool, taking into account the use of existing local raw materials, is the main focus of the District Development Programme in the near future. The establishment of processing of livestock products will contribute in creation of new jobs for the population and reduce poverty in the district.

Poultry farming. 75715 birds are registered in the district, of which 4.2 percent belongs to dekhkan farms and 95.8 percent to the population. Currently, there is the possibility of establishing a poultry factory. As a result, new jobs will be created and production capacity increased.

Beekeeping. Beekeeping is one of the less expensive and profitable areas of agriculture. The climatic conditions of Kubodiyon district are favorable for the development of beekeeping. The existing resources of the region allow to increase the number of bee hives and double the production of honey. In recent years, development of this sector is observed and production of honey is gradually increasing. Honey production from 10.6 tons in 2012 was increased to 13.3 tons in 2014. Over the next five years, honey production is one of the main areas of the District Development Programme.

Fish farming. Development of fish farming, along with other sectors of agriculture, is considered one of the priorities and plays an important role in providing the population with fish and thus contributing to the health condition of the population. Fish products are widely used not only in ensuring food security, but also in the development of pharmaceuticals and the restoration of public health. One of the features of the district compared to other regions of the country is that there is a production base for fish breeding.

The favorable climate and the corresponding conditions of the area allow to grow various species of fish, such as carp, grass carp and silver carp. The location of the area on the banks of the Vakhsh and Kofarnikhon rivers creates favorable conditions for the creation of ponds and creating fish farms. There are 5 specialized fish farms established in the district.

Agricultural land irrigation system. Irrigation and improvement of ameliorative condition of lands is one of the main tasks of the agriculture of the district. The solution to this problem will enable to promote an increase in the volume of agricultural products.

Irrigation canals Katta, Hayot, Chiryk and Kabla are operated in the district. The district department of Land Reclamation and Irrigation owns 13 pumping stations. There are many problems stand in the way of ensuring irrigation water supply and improving the ameliorative condition of lands, the solution of which determines the further development of agriculture sector.

One of the features of the district is that part of the district's land is located 2-3 meters below the level of the Kofarnihon River. Due to the fact that the groundwater level is very high, this leads to a deterioration of the ameliorative condition of agricultural land and the ecological situation. Currently, 1,432 hectares of agricultural land are in an unsatisfactory ameliorative condition, and 134 hectares with high level of salinity.

The total area of irrigated agricultural land in the district 17.1 thousand hectares. According to the OVH-1 cadastral report, land with a satisfactory ameliorative condition is 1,0495 hectares, 1,432 hectares in poor condition, 44.2 km of inter-farm drainage canals (5 km of them in poor

condition), 326.7 km of intra-farm drainage canals (of these, 126 km is in unsatisfactory condition). The number of wells in the district is 65 units, of which 30 units are inoperative.

The length of the irrigation inter-farm canals in the district is 135.8 km, 21.3 % of them (29 km) are in poor condition. The length of on-farm canals is 394.5 km. Of the total length of the existing canals, 501.3 km are in a satisfactory condition, and 29 km are in an unsatisfactory condition.

On the territory of the district, water is supplied to irrigated lands through canals and pumping stations. Due to poor financing, depreciation of pumps and existing equipment, in recent years almost 1096 hectares of irrigated land have been withdrawn from agricultural use (in Zamkamar jamoat - 41 hectares, U. Nazarova jamoat - 18 hectares, I. Niyozova jamoat - 347 hectares, N. Khusrav jamoat - 170 hectares, 20 solagii Istikloliyat jamoat - 211 hectares, Takhti Sangin jamoat - 150 hectares and Navobod jamoat - 159 hectares).

More than 9991 hectares of arable land of the region is supplied with irrigation water through pumping stations. The main part of pumping stations is worn out due to poor technical condition, which often goes out of order. This situation creates additional difficulties in the timely supply of sown land with irrigated water.

The main reason for the deterioration of the land ameliorative condition is due to not conducting desilting activities and limited financial resources. In order to eliminate the existing problems in this field, according to the Resolution of the Government of the Republic of Tajikistan No. 612 of December 31, 2009 “On measures to improve the ameliorative condition of irrigated agricultural land in the Republic of Tajikistan for 2010-2014”, the ameliorative condition of the district lands has been improved over the past two years.

Over the past two years, as a result of cleaning the drainage canals and collectors, 517 hectares of irrigated agricultural land in the region have been transferred from poor reclamation conditions to a satisfactory state. Expenditures for these purposes over two years at the expense of the local budget amounted to 371,000 somoni, and payment for water supply services amounted to 82,000 somoni. The total area of land irrigated with water supply facilities of the district is more than 17,100 hectares. The total length of irrigation canals is 530.3 km, of which, as of January 1, 2014, more than 40 % (212 km) were cleared. The total length of the district drainage and collector networks is 370.4 km, of which 44.2 km (12 %) belongs to district irrigation water department, 326.2 km (88 %) on the balance of dekhkan farms of rural jamoats.

Analyzes show that significant work has been done on cleaning drainage-collector networks in rural jamoats, however, there are still problems in this direction. Not cleaning the drainage-collector networks in rural jamoats is associated with the poor financial situation of dekhkan farms. As a result, payment for water supply services is made in part, and in many cases, work on cleaning the drainage-collector networks (on their list of assets) is done not in timely manner.

5.5. LAND USE MANAGEMENT IN NOSIRI KHISRAV DISTRICT – DOWNSTREAM OF KRB

a. Agriculture and Land Use

Agriculture is considered the basis for the development of the economy of the Nosiri Khusrav district. The main part of the population - 10,500 people, employed in the economic sphere (87%) and the only source of income for most of them comes from activities in this area. The main areas of agriculture in the area are crop, livestock and horticulture. In Nosiri Khusrav 57 collective farms and 1,591 individual dekhkan farms operate. As of January 1, 2014, the total agricultural land area of Nosiri Khusrav district is 67423 hectares, of which 16.3% or 11022 hectares are irrigated land.

From the total reserves of arable land available in the area in 2013, taking into account all forms of management (household plots and presidential lands (2000 hectares)), crops were sown on an area of 7,929 hectares. From the total area of seeding, 3,453 hectares was cereals, 102 hectares was potatoes, 465 hectares was vegetables, 3050 hectares was oil crops and 305 hectares was fodder crops.

Table 11. Agricultural production in the area of Nosiri Khusrav

#	Indicators	Measuring Unit	2000	2008	2009	2010	2011	2012	2013
	Volume of agricultural products	thousand somoni	33576	151289	158318	168554	162269	164958.9	177711
	Including: Crop production	thousand somoni	25162	103930,6	100034.4	117177.4	110152.4	97393,8	104833.6
	Livestock	thousand somoni	8414	47358.4	58283.9	51376.6	52116,6	67565.1	72877.4
1	Cereals	ton	5120	15471	18436	16778	15867	17406	18944.3
	Land for sowing	ha	2807	2519	2976	3159	3007	3166	3453
	Yield	centner	18.2	44.1	44.4	36.4	36.8	37,8	40.7
2	Cotton	ton	4290	6200	5454	2554	4707	6804	6130
	Land for sowing	ha	5006	3841	3171	1900	3002	3050	3050
	Yield	centners per hectare	8.6	16,1	17.2	13.4	15.7	22.3	20
3	Vegetables	ton	4140	6266	6826	7553	9077	9504	12967
	Land for sowing	ha	479	263	274	331	340	379	465
	Yield	centners per hectare	86.4	203.5	202.5	227.1	229.1	229.1	236.8
4	Potatoes	ton	200	1958	2193	2195	2044	2130	2556
	Land for sowing	ha	32	56	64	60	78	81	102
	Yield	centner	62.5	292.5	292.7	339.8	262.1	263	250.6

#	Indicators	Measuring Unit	2000	2008	2009	2010	2011	2012	2013
5	Fruits	ton	157	1988	2002	2026	2120	2280	2428
	Yield	centner	6.4	53.4	53,8	54.5	57	61.3	64
6	Viticulture	ton	97	508	510	610	690	885	950
	Yield	centners per hectare	13.9	31	31.1	37.2	42.1	54	58
7	Pet food	ton	1614	2706	3422	4296	4983	1494	1007
	Land for sowing	ha	120	884	727	1035	674	564	305
8	Gourds	ton	3381	16783	17859	20747	19510	18118	19187
	Land for sowing	ha	381	471	601	1050	592	557	554
	Yield	centner	88.7	241.3	264.1	163.2	233.8	229.2	227
Livestock products									
1	Meat	ton	679	1786	1827	2347	2596	2842	3072
2	Milk	ton	508	4773	5644	6836	7665	8282	8937
3	Eggs	a thousand pieces	171	679	787	1024	1155	1290	1378
4	Honey	ton	-	11	11	11	12	14.6	14.9
5	Cocoons	ton	five	17	12	7	11	11	11

Crop production. The total volume of crop production in all categories of farms in the region in 2013 was 104.8 million somoni, which is 7.6% more than in 2012. The results of the analysis showed that the volume of crop production in recent years has tended to increase, the yield from each hectare of land, with the exception of cotton, potato and melon crops, has increased relatively. In 2013, compared to 2012, cereal production increased by 7.7% and vegetable production by 3.4%. However, an increase in the volume of cereals, vegetables and melons was achieved by re-seeding. Thus, in 2013, due to the re-sowing (only in households), 4.9 thousand tons of grain, 1.9 thousand tons of vegetables and 6.6 thousand tons of melon crops were additionally produced.

Table 12. Crop production in all forms of farms

Indicators	In-kind (ton)			In cash in current 2013 prices (thousand somoni)		
	2011	2012	2013	2011	2012	2013
Cereals	15868	17406	18944.3	33846.4	24440,5	26667.8
Vegetables	9077	9504	12967	22701	140804	19097.9
Potatoes	2044	2130	2556	4426.8	3358	4092.6
Fruits	2120	2280	2428	8350	6693,7	7013
Pet food	4983	1494	1007	2491.5	2774.6	2795.5

Horticulture is one of the main components of the region's agriculture and occupies a special place in providing the population with various kinds of fresh and early fruits and in providing the population with permanent jobs. The favorable climate of the region makes it possible to

increase the area of orchards by planting high-yielding trees and creates the basis for fully meeting the population's demand for fruits and increasing the volume of supplies to other cities and regions of the republic, as well as exports to neighboring countries. The growing demand for fruit and construction materials, especially for wood (by planting non-bearing trees) and the favorable climate of the region, helps to accelerate the solution of socio-economic problems in rural areas and will enable the development of gardening in the region in the future.

The main problem associated with the development of gardening is, above all, the restoration of the material and technical base of the horticultural industry. The main reason for the decline in yield is the spread of various fungal diseases and an increase in the number of harmful insects. The peak season of diseases and the growth of the number of harmful insects, depending on the climatic conditions of the area and their biological qualities that cause damage to trees, is different. Therefore, in this direction it is necessary to organize a special group to predict the spread and control of insects and to restore the activity of plant protection centers.

Irrigation system. Irrigation of new lands and improvement of their ameliorative condition is also one of the problems in the sphere of agriculture, the solution of which is especially important for increasing agricultural production and providing the population with jobs. Provision of irrigation water in the region is entrusted to the State Administration of Land Reclamation and Irrigation of the Nosiri Khusrav district, which employs 39 people, including 11 engineers, 12 machine operators and 11 pump station workers. This organization provides services on a contractual basis for 3 WUAs (WUA " Beshkent ", " Korvon 2014" and " Vodiya Beshkent "with coverage of more than 800 dekhkan farms) and population of 3 Jamoats of the region (" Firuza ", "Istiklol "and" Navruz " jamoats) for providing irrigation water, repair of facilities, drains and collectors and irrigation networks, including improvement of ameliorative condition of 14,125 hectares of land.

On the territory of the district there are 11 units of pumping stations (including 1 pump station "Muzbeshkent-2", with 6 units of manufacture installed in 1980 which is also owned by the organization). Currently, only 2 units are in working condition, which provide improved reclamation condition for 2800 hectares of land through groundwater pumping. The remaining 4 units and 604.9 km of the irrigation system are worn out and out of order (118 km of inter-farm networks and 486.9 km of on-farm irrigation networks), as well as 418 km of drainage and collector (51 km of inter-farm networks on the balance of the state administration of land reclamation and irrigation of the region and 367 km of intra-farm networks). Solving these problems can help increase the level of agricultural production and provide the population with permanent jobs.

Further development of the crop and horticulture sector depends on the development of new lands, the commissioning of pump stations and the restoration of water supply facilities, which will contribute to the inclusion in the agricultural land of Firuz jamoat - 100 hectares, Jabbor Kodirov - 170 hectares and Navruz jamoat - 90 ha, as well as providing 10,000 people with drinking water.

During 2011-2013 in the area of 11,022 hectares of irrigated agricultural land, more than 6,600 thousand hectares (almost 60%) are subject to salinization, which caused a decrease in crop

yields by 12%. The economic damage caused during the last 3 years is approximately 2.7 million somoni (this figure is calculated on the basis of cotton yield).

In the case of repairing pump stations, cleaning and restoring on-farm and inter-farm networks, 2500 new jobs will be created in the area, agricultural production will double, and farm incomes will increase, crop yields will increase to about 8%, the economic benefit of the agricultural sector of the district will be approximately 2,5 mln. somoni.

Livestock and poultry. Along with other areas of agriculture, livestock is one of the main components of agriculture, whose share in the gross agricultural product of the district is 41 percent. In 2013, agricultural enterprises of the N. Khusrav district produced animal products for the amount of 72.9 million somoni, which is 7.8 percent more than in 2012.

In the district, animals and birds are sold between households. In general, cattle sales are common among households in the district. In the district where there are no state enterprises, only households sell cattle and small ruminants.

Table 13. The total livestock of animals in all forms of management

Indicators	2010	2011	2012	2013	2013 compared to 2010 in %
1. Cattle	15420	15881	15884	15889	3.04
2. Goats and sheep	35190	36337	36403	36418	3.5
3. Birds	22135	22632	22885	22935	3.6
4. Horses	479	435	435	435	-9.1

In recent years, animal husbandry contributes to the development of the agricultural sector of the district. However, in order to further increase the volume of livestock production, it is necessary to increase the area of sowing of animal feed and oil crops in farms. To improve the breeding qualities of animals, it is necessary to create a base of breeding animals in specialized farms, to provide winter and summer pastures, to increase the livestock of animals in those farms that have reduced their livestock, to create favorable conditions for the development of animal husbandry in the private sector.

At the same time, in the farms of the district, in order to ensure the implementation of the “Program for the restoration and further development of beekeeping in the Republic of Tajikistan”, bee breeding has been established, and according to this program, the number of bee colonies will increase in the following years.

Problems of the agricultural sector: deterioration of agricultural machinery in existing dekhkan farms, lack of modern material and technical base, restrictions on the provision of long-term loans, in particular for the development of horticulture and animal husbandry, lack of funds for repairing the pump system for irrigation and drainage of land, cleaning of drainage, collectors

and canals, shortages in provision of fuel, toxic chemicals and other mineral fertilizers, lack of quality seeds, poor condition of inter-farm roads of the region.

For the next 5 years, the main tasks of the agricultural sector are to improve the ameliorative condition of irrigated land, expand the area of crop planting, and develop the cotton industry, vegetable growing, animal husbandry, beekeeping and fish farming. In summary, agriculture sectors main problems include:

- Depreciation and failure of existing equipment in agricultural enterprises, the lack of material and technical base and modern technology;
- Late provision of quality seeds, increase in the cost of fuel, mineral fertilizers, pesticides and other tariffs for services;
- Limited access of farms to long-term loans with low interest rates;
- Low level of services and poor state of infrastructure in agricultural enterprises, in particular with regard to the provision of irrigated water and local roads;
- Debt of dekhkan farms on taxes and bank loans;
- Lack of support for farmers;
- Shortage of enterprises on the processing of agricultural products (fruits, vegetables, milk and meat);
- Non-compliance with agrotechnical measures and failure to use the crop rotation system;
- Reduced crop yields;
- Increasing the number of insect pests, various diseases and the lack of access to medicines, toxic chemicals for garden cleaning;
- The insecurity of livestock farms with vaccines and difficulties with the provision of veterinary services at the level of jamoats;
- Lack of equipment and modern veterinary equipment;
- The lack of collecting points for leather and wool and their processing;
- Lack of special places for slaughter and special places for neutralization;

5.6. LAND USE MANAGEMENT IN SHAARTUZ DISTRICT – DOWNSTREAM OF KRB

a. Agriculture sector and land use

Representing the primarily important sector in Shahrituz District, agriculture plays a paramount role in advancing the district's economy. 50 percent of able-bodied population are engaged into agricultural sector, which is the only source of income for overwhelming majority of district population.

Crop-growing, cattle-breeding and horticulture are the principle direction of district's agricultural sector. Household farms and dehqan farms are the basic producers of agricultural products. The share of dehqan farms in producing cereals, fruit and the share of household farms in producing carrot, potato, milk, meat, egg and wool is notable in the aggregate volume of agricultural production.

The basic objective of the agricultural sector is to improve the melioration state of irrigated lands in the forthcoming two years, to widen the area of gardens in dry land areas, to further develop cattle-breeding, bee-keeping and fish-farming.

Agricultural sector's operational form. 32 auxiliary farms, 12 collective dehqan farms, 156 individual dehqan farms, 5 fish-breeding farms and over 1830 household farms operate in the district. Out of 1998 dehqan farms operating in the district 703 farms (or 35,2 %) are managed by women.

The basic challenge the district farmers face is lack of sufficient agricultural information and market conjuncture for selling the agricultural products that negatively affects the sector's progress (over 80 percent of district's farmers lack working experience and agricultural information, 90 percent lack managing experience and 92 percent of dehqan farms failed arranging appropriate farm management accounting).

Another challenge that exerts negative impact on producing agricultural goods is unfavourable condition of material and technical bases, insufficient financial state of farms, unavailability of spare parts for agricultural machinery, increasing price for fuels and lubricants as well as deterioration of major part of agricultural technical appliances and equipment available in the farms' balance.

Land use. For the status of 1 January 2018, the total agricultural land areas in Shahrituz District made up 152537 hectares, including 18507 hectares of irrigated land areas. From the total land areas 70,5 percent (107553 hectares) are pasture lands, 3,0 percent (4551 hectares) are household plots of land, 0,4 percent are farms' auxiliary lands (712 hectares) and 9,2 percent (14097 hectares) represents other types of land. Most land areas have agricultural assignment and entrusted to the dehqan farms. Irrigated arable lands are primarily used for the cultivation of cotton, potato, vegetables, cereals and cattle forage crops. Out of the total agricultural land areas (121873 hectares) 14219 hectares are irrigated lands, 2300 hectares represent perennial trees and 107553 hectares of pastures.

In 2018, land areas assigned to agricultural crops constituted 8840 hectares that made up 0.08 hectare per person considering all types of farms. In the same year, from the reserve of arable land areas available in the district (considering all types of farm management forms), crops were cultivated in 8799,1 hectares that represents 461.1 hectares more as compared with that of the last year. From the total land areas under crop cultivation, land under cereals cultivation made up 1639 hectares, land under cotton cultivation made up 5250 hectares, land under potato cultivation made up 200 hectares, land under vegetables cultivation made up 1001.1 hectares and land under melons and gourds made up 550 hectares. Within the programme's framework, development of new lands are expected considering the geophysical, meliorative and chemical conditions of land.

Crop growing. During 2017, the total volume of crop produced in Shahrituz District covering all categories of farms made up 451,5 million somonis representing a 7.0% increase as compared with the indicators of this period of 2016.

Analyses demonstrate that during recent years, the volume of crop production favours an increasing tendency with yield volume per hectare of land increased respectively. For example, in 2017 the volume of cereals production increased 2,8% (990,7 tons) as compared with 2016.

Table 14. Crop production in 2016-2017

№	Indicators	In kind (tons)		Difference (+;-)
		2016	2017	
1	Cereals	35362,9	36353,6	+990,7
2	Vegetable	53197,1	59020,9	+5823,8
3	Potato	9678,9	7817,9	-1861
4	Fruit	8375,7	8476,5	+100,8
5	Cotton	9016,1	11567,3	+2551,2

The district's agricultural farms are engaged into production of cereals (wheat, barley, pea, corn), cotton and other industrial crops (flax, beniseed), potato, vegetable (cabbage, carrot, onion, tomato, cucumber and etc.), cucurbits crop (melon and water-melon) and cattle forage. During the last two years, production of cereals, vegetables, cotton and fruits increased proportionately.

Lacking development of agricultural sector at a sufficient level during recent years, particularly, crop production, were dependent on many factors, including the lack of enterprises for processing agricultural products, restricted access of farms to low-interest and long-term loans, low level of services and unfavourable condition of agricultural farms' infrastructure, especially, as it concerns water supply to cucurbits crop and local roads.

Potato growing. Potato-growing is considered as one of the most income-generating sectors for the district's agricultural farms and revenue generated from it increased during recent years. In 2017, crop was cultivated in the areas of 123 hectares of the district's agricultural farms, which is 2 hectares more as compared with this period of 2016, however its production volume in 2017 is 1861 tons less as compared with 2016.

Horticulture. Gardening is one of the district's priority and profitable sectors. This sector also has a strategic feature, because it plays an important role in enhancing the supply of internal and external market with fresh fruits and represents the district's source of export and ensuring district population's permanent employment.

The Programme's primary objective in the gardening direction is to restore the previously maintained areas under gardening and grape-growing, to substitute low-yield and low-quality species into high-yield and high-quality species meeting today's requirements, to increase the areas under gardening and grape-growing based on creating new gardens and to improve their productivity.

The primary reason behind reducing productivity is spread of different fungi diseases and increased number of pests. In order to address the existing challenges it is reasonable to organize a regional forecasting team to prevent the spread and counter pests as well as rehabilitate the operation of plant protection points.

Irrigation system. Irrigation of newly developed lands and improving their melioration circumstances are one of the existing challenges in the agricultural sector tackling of which is crucially important to increase the volume of agricultural production and ensure population's employment. The State Enterprise "Kofarnihan Downstream Water Management" is involved into supplying with irrigation water in the district where 116 peoples are employed, including 23 people working in the water-pumping stations. This enterprise operates "T-130" 3 bulldozers, 2 "Э-652" excavators, 2 MAZ trucks. The enterprise is responsible for the maintenance, cleaning and rehabilitation of 133 kilometers of intra-farm and inter-farm channels, 77,5 kilometers of intra-farm and inter-farm catchments and drainages. 3 pump stations exist in the district (Lenin-1, Iskra, Leningrad) with 10 water pumps aggregately, out of which 2 water pumps are operational and 8 water pumps are non-operational currently requiring complete repair. 2706 hectares of irrigated lands within the district are supplied with water using pump stations and owing to the deterioration of 45 percent of water-pumping stations during recent years, nearly 790 hectares of irrigated lands remained off the agricultural turnover.

Technical conditions of Khushodi, T.Sadriddinov, Shahrituz and Tartqi channels, the existing catchments, drainages and drain tunnels do not meet the requirements. 6 drain tunnels in "Leningrad" are non-operational now. In case of rehabilitating the irrigation of the existing lands, the volume of producing agricultural goods will double, thus increasing the farms' profitability to 2.5% and creating 360 new job places.

Cattle-breeding. Equally with the other agricultural directions, cattle-breeding is one of the main sectors the comparative ratio of which among the district's gross agricultural products represent 26,6 percent. In 2017, the district's cattle-breeding farms generated products worth 163,7 million somonis.

According to the official statistics for the status of 31.12.2017, a total of 124574 headcount of cattle, goats and sheep has been recorded in the district.

Table 15. Total headcount from all farm management types for 2015-2017

№	Indicators	2015	2016	2017
1	Cow	37577	40050	40162
2	Goat and sheep	70134	78474	84412
3	Poultry	123300	126874	127225
4	Horse	1018	1039	1053
5	Bee families	1118	1120	1462

47 percent of livestock and poultry sale in the district is performed through the household farms. Generally, the livestock sale is widely common between the district's household farms. In the district, 63% of household farms are engaged into selling cattle and 72.3% and 53.2% of farms are respectively involved into selling goats and sheep.

Favourable conditions are available in Sharituz District to develop the cattle-breeding sector and organizing livestock forage base. The total pasture area represents 107556 hectares, however pastures are not effectively used. Out of 56 farms engaged into cattle-breeding, only 12 farms are

assigned with winter and summer pastures, however other cattle-breeding farms do not have access to pastures.

During the recent years, the cattle-breeding sector became unprofitable for some district farms and a number of measures should be in place to save the sector from this disadvantaged condition; these measures include increasing and widening land areas under livestock forage, increasing land areas for the cultivation of oil-producing plants for cattle-breeding farms, organizing foundations for thoroughbred livestock generations in the specialized farms, ensuring the availability of winter and summer pastures, increasing the livestock headcount that has been decreasing recently, creating favourable conditions for livestock development in private structures and exploring additional pastures for goats and sheep. Out of the total livestock headcount in household farms 98,1 percent make up cattle (including, 98.9 percent of cow), 87,5 percent of goats and sheep, 99,5 percent of poultry and 90,1 percent of horse.

Bee-keeping. Bee-keeping represents one of the cost-effective and profitable agricultural sectors. The district's climatic conditions are favourable for bee-keeping. The existing reserves of nectariferous plants allows increasing the number of bee families (1501 families) and double its production.

The district's challenges in the agricultural sector are: dilapidated and inoperable conditions of agricultural machinery; lack of material and technical bases as well as state-of-the-art technology for processing agricultural products; lack of financial resources to ensure irrigation of lands as well as cleaning and rehabilitation of drainages, collectors and streams; lack of timely supply with fuels, chemical weed and pest killers and other fertilizers; unavailability of high-quality seeds, lack of repair and maintenance of automobile roads between the farms and within the district; indebtedness of dehqan farms from tax authorities and banks, lack of free guarantee for dehqan farms to choose any crop cultivation; lack of enterprises to process the agricultural products (fruits, vegetables, milk and meat); unequal distribution of pastures between the cattle-breeding farms; non-compliance with agro-technical rules and failure to use crop rotation; reduced fertility rate of agricultural crops; increased number of pests, different diseases and unavailability of chemical weed and pest killers to clean gardens; providing cattle-breeding farms with vaccines and challenging veterinarian service at the level of communities (jamoats); lack of modern veterinarian technical appliances and equipment; lack of specially assigned places to slaughter livestock and specific places for neutralization from infectious diseases; lack of artificial insemination point at the level of communities (jamoats).