



## ADAPTATION FUND

AFB/PPRC.28/5  
4 October 2021

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Adaptation Fund Board  
Project and Programme Review Committee  
Twenty-eighth Meeting  
Virtual meeting, 11-13 October 2021

## PROPOSAL FOR BHUTAN

## 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 "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" was submitted for Bhutan by the Bhutan Trust Fund for Environmental Conservation (BT FEC), which is a National Implementing Entity of the Adaptation Fund.

10. This is the first submission of the fully-developed project proposal using the two-step submission process.

11. It was first submitted in the intersessional period between the first and the second session of the thirty-fifth Board meeting as a concept proposal and the Board decided:

*(a) Endorse the concept note as supplemented by the clarification responses provided by the Bhutan Trust Fund for Environmental Conservation (BT FEC) to the request made by the technical review;*

*(b) Request the secretariat to notify BT FEC of 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 project proposal should fully identify project activities and include quantifiable results in line with the environmental and social policy of the fund;*

*(ii) A clear description of alternative options to the proposed measures should be provided at fully developed proposal stage, to allow for a good assessment of the project cost effectiveness;*

*(iii) The fully developed proposal should include linkages and synergies with all the relevant projects, including areas of overlap and complementarity; and*

*(iv) The fully developed proposal environmental and social risk screening should identify all the possible inherent risks and a justification for the screening selection should be provided under each principle.*

*(c) Approve the project formulation grant of US\$ 30,000;*

- (d) Approved the project formulation assistance grant of US\$ 20,000;*
- (e) Request BTFEC to transmit the observations under subparagraph b) to the Government of Bhutan; and*
- (f) Encourage the Government of Bhutan to submit, through BFTEC, a fully developed project proposal that would also address the observations under subparagraph b), above.*

**(Decision B.35.a-35.b/58)**

12. The current submission was received by the secretariat in time to be considered in the thirty-seventh Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number AF00000229, and completed a review sheet.

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

14. 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.



ADAPTATION FUND

## ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular Size Full Proposal

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**Country/Region:** Bhutan  
**Project Title:** Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan  
**Thematic Focal Area:** Multisector  
**Implementing Entity:** Bhutan Trust Fund for Environmental Conservation  
**Executing Entities:** Department of Agriculture & Department of Forest & Park Services Ministry of Agriculture and Forests;  
Department of Engineering Services, Ministry of Works and Human Settlements;  
Department of Local Governance, Ministry of Home and Cultural Affairs.  
**AF Project ID:** AF00000229 / BTN/NIE/Multi/2020/1  
**IE Project ID:** **Requested Financing from Adaptation Fund (US Dollars):** 9,998,954  
**Reviewer and contact person:** Martina Dorigo **Co-reviewer(s):** Imen Meliane  
**IE Contact Person:** Singye Dorji; singye@bhutantrustfund.bt

Technical Summary	<p>The project “Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan” aims to build resilience to climate change and adaptive capacity of water stressed communities in the dzongkhags (districts) of Paro and Dagana. This will be done through the four (4) components below:</p> <p><u>Component 1:</u> Adaptive management of watersheds to enhance climate resilience of communities (USD 800,000);</p> <p><u>Component 2:</u> Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation (USD 6,384,697);</p> <p><u>Component 3:</u> Climate-smart agriculture through sustainable land management and informed agro-meteorological services (USD 1,230,055);</p> <p><u>Component 4:</u> Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots (USD 204,667).</p> <p><u>Requested financing overview:</u> Project/Programme Execution Cost: USD 600,000</p>
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	<p>Total Project/Programme Cost: USD 9,219,419  Implementing Fee: USD 779,536  Financing Requested: USD 9,998,955</p> <p>The initial technical review raises some issues such as the need to further substantiate the cost-effectiveness of the selected approach, the inadequacy of environmental and social risk screening and compliance with the Fund's Environmental and Social Policy, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review.</p> <p>The final technical review finds that the proposal has not address some of the CR and CAR requests. Namely, the cost-effectives of the envisaged adaptation measures and the compliance with the Fund's Environmental and Social Policy is yet to be demonstrated.</p>		
Date:	23 September 2021.		
<b>Review Criteria</b>	<b>Questions</b>	<b>Comments initial technical review</b>	<b>Comments final technical review</b>
Country Eligibility	1. Is the country party to the Kyoto Protocol?	<b>Yes.</b>	-
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	<b>Yes.</b> As a Least Developed Country (LDC) with a geologically fragile and young mountain ecosystem, Bhutan is highly vulnerable to climate change and its impacts. Further, as a mountainous country with a huge area of snow and glaciers and an intricate natural drainage system of several watersheds, water catchments, rivers, rivulets and streams, the country is intrinsically exposed to and impacted by multiple climate change hazards including glacial lake outburst floods, landslides, and flash floods. Moreover, rainfall patterns are becoming increasingly erratic, leading to water scarcity in many areas and posing huge adversities for farmers who largely practice rainfed agriculture.	-

Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	<p><b>Yes</b>, as per the Letter of Endorsement signed on 21 July, 2021.</p> <p><b>CAR1:</b> The LOE refers to the Gross National Happiness Commission Secretariat as the executing entity, however this institution is not listed in the project cover page, please include it.</p>	<b>CAR1: Addressed.</b>
	2. Does the length of the proposal amount to no more than one hundred (100) pages for the fully-developed project document, and one hundred (100) pages for its annexes?	<p><b>No</b>. While the annexes amount to 97 pages, the project document has 133 pages.</p> <p><b>CAR2:</b> Please reduce the total number of pages for the project document to 100 pages. It is noted that some information in section C and in Annex I are repeated, please consider amending as necessary.</p>	<p><b>CAR2: Not addressed.</b></p> <p>The proposal clean copy has 107 pages and the annexes 103 pages.</p>

	<p>3. 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><b>Yes, in principle.</b> The project aims to address a major climate change vulnerability in Bhutan related to current and future freshwater availability and irrigated subsistence agriculture through an integrated approach of integrated landscape management in four dzongkhags (districts): Paro, Sarpang, Tsirang and Dagana. This approach considers the integrated watershed management, ecosystem-based adaptation and sustainable land management as sub-components to achieve its objective.</p> <p>Overall, the project seems well developed and appropriate to respond to climate risks through this systemic approach that includes improved ecosystem services from the source along the watershed, climate-resilient infrastructure for better management of water uses by human activities, improved information systems and decision making, and linking with the most relevant level of governance. The proposal would greatly benefit from the inclusion of a Theory of Change graph which would display the suitability of the proposed activities in different sectors to the threats posed by the likely climate scenarios.</p> <p>Much of the requested funding would go to concrete adaptation activities of water infrastructures for uninterrupted supply of water for drinking and irrigation purposes, with the other activities being designed to facilitate the success of climate-resilient infrastructure. The project activities support the Fund's Strategic Objectives 3, 4, 5 and 6. However, further information is needed for the following aspects:</p> <p><b>CR1:</b> Overall the proposal does not specify the possible set of adaptation interventions under outcome 1. There is only a reference to conservation/restoration activities (output 1.3).</p> <p>Please provide details on the type, scale and location for the envisaged activities. Under component 1, the project aims to upscale Payment for Ecosystem Services (PES) schemes in two of the project districts, which would empower communities in the natural resources' management.</p>	<p><b>CR1: Not cleared.</b> The revised proposal does not provide additional information regarding the type of envisaged adaptation measures. The agency in the review sheet provided a list of foreseen measures, which include: SLM activities, establishment of check dams, plantations of site appropriate grasses/trees and other land stabilization, watershed conservation and water source revival activities. If further specifies that the scale of these measures cannot be defined due to the lack of a proper assessment.</p> <p><b>CR2: Cleared.</b> From the agency response in the review sheet, it is clarified that in Bhutan there are adequate policies and legislations which support the implementation of the PES. In addition, there is a PES framework and field guide. This information should be included in the main proposal as well.</p>
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		<p><b>CR2:</b> Please clarify the institutional arrangements that will need to be put in place for the operationalization of the PES schemes, taking into account any lesson learned from the four schemes already established at national level.</p> <p>The proposal mentions that the project will carry out detailed assessment of watersheds in the project dzongkhags (districts) to define prioritized watersheds for interventions by mid-term. Further it states, “an exhaustive list of appropriate interventions will be identified, consulted and implemented”. Comprehensive formulation of project activities requires that the nature of an activity as its precise location in terms of environment and social setting are known. Climate resilient water and irrigation infrastructure include the construction and rehabilitation of six drinking water supply schemes; construction of at least two pressurized/closed irrigation systems; reengineering/ rehabilitation or improvement of four existing irrigation systems; scale-up micro-irrigation systems; small earthen check dams and ponds and reservoirs.</p> <p><b>CR3:</b> Please clarify whether the nature/quantity and precise location for the concrete adaptation investments is still not defined. If the location and technical nature of investments is not clear, the project presents Unidentified Sub-Projects (USPs) and this approach should be clearly justified (i.e. impossibility of identifying adaptation measures during as part of the project design).</p> <p><b>CR4:</b> The proposal mentions that a watershed management plan is already developed in Dagana district, with some activities already undergoing in some geogs (villages). Activity 1.1.3 reports that the project will conduct one detailed watershed assessment per district. Given that Dagana has already a watershed management plan, can you clarify how the project will build on it?</p> <p><b>CR5:</b> Output 1.3 “Water sources recharge interventions adopted” allocates a budget line for monitoring and maintenance of conservation/restoration activities. Can you specify by whom will this work be conducted?</p> <p><b>CR6:</b> Under output 2.1, please specify how the database for the water inventory will be managed and how it will be maintained after the project finalization? How will the information be accessible to different stakeholders?</p>	<p><b>CR3: Not cleared.</b> The agency provided a clarification in the review sheet only, referring to fact that the precise scope of activities as well as their location depend on detailed assessments, which were not undertaken at this stage.</p> <p><b>CR4: Cleared.</b> The watershed management plan in Dagana does not include the whole district. The project will use the experience gained from the current plan to maximize the effectiveness of the activities.</p> <p><b>CR5: Not cleared.</b> Additional information was provided just in the review sheet and not in the proposal.</p> <p><b>CR6: Cleared.</b> As specified on page 27, the existing information system is managed by the Water and Sanitation Division and data input shall be provided by the respective local government periodically and information will be shared with relevant stakeholders.</p>
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	<p>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?</p>	<p><b>Not clear.</b></p> <p>With a geologically fragile and young mountain ecosystem and as a least developed country, Bhutan is highly vulnerable to climate change and its impacts. To sustain agriculture, new sources of water must be identified locally, tapped into and invigorated, and innovation is required in water storage, including water harvesting, and usage. The proposal outlines in a general way the benefits that the project will provide.</p> <p><b>CR7:</b> Please provide, wherever feasible, estimated quantification of benefits, especially the economic benefits.</p> <p>The proposed project is expecting to benefit 5,297 households or over 30,215 direct beneficiaries. However, it does not specify whether there are any indigenous communities in the project target areas.</p> <p><b>CR8:</b> Clarify how the project will ensure an equitable distribution of benefits to vulnerable communities, households and marginalized and indigenous groups and clearly outline them.</p> <p>The proposal includes a Gender Assessment and Gender Action Plan (GAP) (Annex 2) outlining the different needs, capabilities, roles and knowledge resources of women and men. The GAP includes clear recommendations on how to mainstream gender into the project activities. However, the recommendations seem not to be fully reflected into the project document.</p> <p><b>CAR3:</b> Please include information on how the project will practically mainstream gender throughout its components (in the section of the project outputs' description), to ensure alignment with the GAP.</p>	<p><b>CR7: Cleared</b>, as per information provided on pages 38-39.</p> <p><b>CR8: Not cleared.</b> The sentence "the ESMP identifies prioritizing award of project works on contractual arrangements [...] so that vulnerable communities and households who cannot afford to participate in project activities do not get excluded from benefitting" included on page 39, does not clarify how the project will practically ensure an equitable distribution of benefits.</p> <p><b>CAR3: Cleared</b>, as per additional information provided under activity 2.4.1 and 2.4.2 on page 30. The project will form and strengthen registered water user groups (WUA), including poor and vulnerable households, and 30 per cent of the WUA committee members will be women. Nevertheless, gender mainstreaming should be ensure also under project component 3.</p>
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	<p>5. Is the project / programme cost effective?</p>	<p><b>Needs to be further substantiated.</b></p> <p>Albeit the project provides a good justification for cost-effectiveness of the proposed measures against a business-as-usual scenario, and the system-wide scope and approach of integrated watershed management overall seems logical and well-suited for cost-effectiveness and project sustainability, the proposal generally lacks information on alternative approaches to water management considered or used. In addition, more quantitative and detailed data is needed to support the cost-effectiveness.</p> <p><b>CAR4:</b> Please include information on alternative measures that could have taken place instead of the selected approach, which are now described only for project component 2.</p> <p><b>CR9:</b> Consider including more quantitative data to support the cost-effectiveness of the selected approach compared to the alternative measures.</p>	<p><b>CAR4: Not addressed.</b></p> <p><b>CR9: Not addressed.</b></p>
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	<p>6. 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 relevant instruments?</p>	<p><b>Yes.</b> The proposal is in line with the Royal Government of Bhutan's Water Flagship Program, Bhutan's National Development Plan (it will contribute to five of the 17 National Key Areas). Furthermore, is in line with the National Environment Strategy 2020, and with the National Agriculture Sector's 12<sup>th</sup> Five Year Plan. The country first National Adaptation Plan with a focus on the water sector is under development.</p> <p><b>CR10:</b> Please clarify the link of the proposed project to climate/adaptation-relevant strategies, if such instruments exist, e.g. NAPAs, NDCs.</p>	<p><b>CR10: Addressed</b>, as per information provided on page 43. The project clarifies its alignment with the first NDC and with the draft NAP (which should be finalized in 2021).</p>
	<p>7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?</p>	<p><b>Not clear.</b> Relevant national technical standards are identified nevertheless the steps taken to comply with them and the nature of the authorization/clearance granted for the project to be implemented is not provided.</p> <p><b>CR11:</b> Please clarify how compliance with the listed technical standards in the proposal will be practically ensured.</p>	<p><b>CR11: Cleared</b>, as per information provided on page 45.</p>

	<p>8. Is there duplication of project / programme with other funding sources?</p>	<p><b>Unclear.</b></p> <p>The proposal provides general information on how it will be complementary to existing and pre-approved projects, including with GCF and GEF-LDCF, however more specific information is lacking.</p> <p><b>CR12:</b> Clarify how the project will create practical synergies and how duplication will be avoided with the GCF project “Supporting Climate Resilience in the Agriculture Sector in Bhutan”, since two of the target districts are the same. Consider establishing a framework for cooperation/coordination during implementation.</p> <p>The proposal mentions that the National Soil Services Centre, has implemented a number of SLM project through various donors (GEF; UNDP-SGP). These projects piloted and scaled-up climate smart agriculture with a focus on SLM measures.</p> <p><b>CR13:</b> Clarify how are lessons learned and best practices from these projects have been taken into account into this project’s design.</p> <p><b>CAR5:</b> Include the IFAD funded project “Commercial Agriculture &amp; Resilient Livelihood Enhancement Program” and the World Bank project “Food Security &amp; Agriculture Productivity Project” in the list of potentially overlapping projects and state in a clear manner how complementarity and lack of overlap will be ensured.</p> <p>You might want to consider displaying the list of all the past and current projects, including their brief description and how the proposed project will practically ensure synergies, ensure that any earlier lessons, if relevant to the project, are taken into account, and/or avoid overlap in a table format.</p>	<p><b>CR12: Cleared.</b></p> <p>As per the additional information provided on page 46, synergies between these two projects will be ensured through the Gross National Happiness Commission which, as central coordinating agency, will ensure that a coordination framework between the two projects will be put in place.</p> <p><b>CR13: Not addressed.</b></p> <p>Comprehensive information on lessons learned and best practices was provided by the agency in the review sheet but was not included in the proposal, this needs to be revised accordingly.</p> <p><b>CAR5: Addressed,</b> as per information provided on page 47. The IFAD project sites are beyond the scope of this project, nevertheless since the IFAD project includes activities on irrigation and land development, lessons learned and documented from IFAD project will be taken into account for the implementation of this project.</p>
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	<p>9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?</p>	<p><b>Yes.</b> The project does not include a separate knowledge management component, but knowledge management is well integrated into all the project components. Specifically, it will seek to establish and strengthen the existing knowledge management system and establish appropriate models of communication. Key lessons learned and best practices will be documents for wider dissemination and policy mainstreaming.</p>	-
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	<p>10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?</p>	<p><b>Not clear.</b></p> <p>A gender-responsive consultative process has taken place in the four district target areas and respective villages (two villages were not consulted due to COVID-19 restrictions). This led to the development of the Gender assessment and Gender Action Plan.</p> <p><b>CR14:</b> Please clarify whether consultations addressed also environmental and social safeguards process and outcomes, as Annex 2 findings are related to gender only.</p> <p>While the proposal includes a list of consultations undertaken at local level (Annex II) including a list of participants, it is unclear which institutions were consulted at national level and how the outcomes of such consultations were integrated into the project's design.</p> <p><b>CR15:</b> Please include information documenting the consultative process, including the list of stakeholders already consulted (principles of choice, date of consultation), b) a description of the consultation techniques (tailored specifically per target group), and c) the key consultation findings (in particular suggestions and concerns raised).</p> <p><b>CR16:</b> Please clarify whether there are any indigenous people in the project target areas, and if any, specify whether these groups were consulted and how their views/concerns are taken into account into the project's design.</p>	<p><b>CR14: Cleared.</b> The agency in the project Annex I (page 1) specified that consultations addressed also environmental and social safeguards.</p> <p><b>CR15: Not cleared.</b> While the consultations at local level are clearly informed (providing list of stakeholders consulted, date of consultations and key findings in Annex 1 and 2). The proposal does not clarify which institutions were consulted at national level and how the outcomes of such consultations were taken into account.</p> <p><b>CR16: Cleared.</b></p>
	<p>11. Is the requested financing</p>	<p><b>Yes.</b> The proposal proves that the planned activities alone, without additional funding, will allow the achievement of the set</p>	<p>-</p>

	justified on the basis of full cost of adaptation reasoning?	adaptation objective and the additionality of the proposed measures is adequately described.	
	12. Is the project / program aligned with AF's results framework?	<b>Yes</b> , as mentioned above, the proposal is aligned with the Fund's Strategic Outcomes 3,4, 5 and 6. Please see CAR17 below for potential adjustments.	-
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	<p><b>Not clear.</b> Sustainability has been informed including institutional and financial sustainability of project outcomes. Sustainable Land Management and Agriculture Land Development activities are mainstreamed into central and local government plans and programs.</p> <p><b>CR17:</b> Please specify how will the database for the water inventory (under output 2.1) be managed and how it will be maintained after the project finalization as per the above comment.</p> <p><b>CR18:</b> In addition, please clarify the arrangements through which the sustainability and maintenance of the water infrastructure to be installed will be ensured.</p> <p>The proposal would also benefit from informing how the knowledge management generated will support replication of successful interventions.</p>	<p><b>CR17: Not addressed</b> Clarification has been provided by the agency in the review sheet but this needs to be reflected in the proposal as well.</p> <p><b>CR18: Not addressed.</b> Clarification has been provided by the agency in the review sheet but this needs to be reflected in the proposal as well.</p>
	14. Does the project / programme provide an overview of environmental and social	<p><b>Not adequately.</b></p> <p>As mentioned above, it is not clear whether the precise locations for the concrete adaptation investments are yet to be identified. The proposal needs to clarify that aspect (see CR 3). If the proposal contains USPs, this approach is not justified nor</p>	



	<p>impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?</p>	<p>this is acknowledged in the environmental and social risk screening.</p> <p><b>CR19:</b> The proposal needs to include adequate provisions to ensure that the USPs will also be compliant with the ESP. Please remember that USPs are acceptable only on exceptional basis and their use must be well-justified. You might want to refer to this guidance document: <a href="https://www.adaptation-fund.org/wp-content/uploads/2021/05/AFB.B.32-33.7_Compliance-with-ESP_Update-of-PPR_and_Guidance-for-USPs_revised.pdf">https://www.adaptation-fund.org/wp-content/uploads/2021/05/AFB.B.32-33.7_Compliance-with-ESP_Update-of-PPR_and_Guidance-for-USPs_revised.pdf</a></p> <p>The proposal was classified as category B as it presents some potential environmental and social risks, however the environmental and social risk screening does not include all the potential direct and indirect risks which it might entail, therefore the risk findings are not substantiated. Further, this section lacks a narrative summary of how the risks conclusions were made, for each principle.</p> <p><b>CAR6:</b> Please provide a comprehensive risk identification in line with the Fund's Environmental and Social Policy, including a justification for each risk finding. For the risks identified, an environmental and social impact assessment should be carried out. The assessment should consider all potential direct, indirect and cumulate impacts that could result from the proposal project.</p> <p>Further, the ESP risks need to be identified based on the 15 AF ESP principles (page 103 mentions that project categorization has been done based on the significance of risks on the 16 principles). Section C states that the project has been screened through the NIE's Environment and Social Safeguards and Gender Screening Tool and risks were identified against each project activity. This is not in line with provisions set forth in the AF Environmental and Social Policy (ESP). Finally, some of the</p>	<p><b>CR19: Not cleared.</b></p> <p><b>CAR6: Not cleared.</b> Although the revised proposal includes detailed findings for the conclusions presented in the environmental and social risk screening table (section K), this does not recognize that the project presents USPs. Furthermore, as above mentioned, the proposal does not contain an acceptable justification for this approach.</p> <p><b>CAR7: Not cleared.</b> There are still discrepancies for the principles 'access and equity'; 'involuntary resettlements' and 'land and soil conservation'. In addition, the screening needs to take into account the AF ESP 15 principles only and not those of the Implementing Entity.</p> <p><b>CR20: Cleared.</b> Short</p>
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		<p>risks identified pertain to project management risks (e.g., impact of COVID-19 pandemic impacting travel).</p> <p><b>CAR7:</b> Please remove any inconsistency between the risk screening table (section K) and the ESS risk categorization tables (pages 103-104 and Annex I), since the risks findings are not aligned.</p> <p><b>CR20:</b> The proposal states that since most of the SLM benefits can be seen in the long-term, often times farmers are discouraged to adopt SLM practices. Further, the proposal states that this issue will be addressed through offering short-term benefits, please clarify what would they be.</p>	<p>term benefits include support in term of seeds, to improve soil fertility, and fruit trees seedings, to increase land cover. However, relevant information was only provided by the agency in the review sheet and needs to be included in the proposal.</p>
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	<b>Yes.</b>	-
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	<p><b>Yes,</b> the implementing entity fee amounts to 8.5% of the total budget before the fee, however there are a few discrepancies to be corrected in the financial sections of the proposal.</p> <p><b>CAR8:</b> The project component and financing table (page 15) has a different amount US\$ 779,535 for the Implementing Entity fee from the one reported in the detailed budget and disbursement schedule, which is US\$ 779,536. Please amend as necessary.</p>	<b>CAR8: Cleared.</b>
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total	<b>Yes,</b> project execution costs amount to 6.5% of the total project budget.	-

	project/programme budget (including the fee)?		
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	<b>Yes</b> , through the Bhutan Trust Fund for Environmental Conservation which is an accredited National Implementing Entity.	-
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	<p><b>Yes.</b></p> <p>The proposed implementation arrangements include a clear description of the roles and responsibilities of the implementing entity as well as the executing entities that are involved in the project. The PMU in the organization chart includes an M&amp;E officer, nevertheless the Safeguards and Gender Specialist, which will be responsible for overseeing implementation of field activities related to the Gender Action Plan, is not listed.</p> <p><b>CAR9:</b> Include the Safeguards and Gender Specialist in the PMU, as indicated in the Gender Action Plan.</p>	<b>CAR9: Addressed</b> , as per amendments on page 65.

	<p>2. Are there measures for financial and project/programme risk management?</p>	<p><b>Yes, largely adequate.</b></p> <p>The proposal includes a table which identifies all major risk categories, consider their significance, and include adequate mitigation measures.</p> <p><b>CAR10:</b> Please consider including a risk related to the possible impact of COVID-19 restrictions on project timely implementation and related mitigation measures.</p> <p><b>CR21:</b> Please clarify whether any of the risk categories considers the feasibility in developing the two PES schemes and related mitigation measures.</p>	<p><b>CAR10: Not cleared.</b></p> <p>While, from the agency response in the review sheet, it is noted that the COVID-19 pandemic management at national level has proven to be efficient, this risk was repetitively mentioned in the table of environmental and social risk and impacts identified by the stakeholder consultations (Annex I), therefore it would be important to include it in the overall project risk management.</p> <p><b>CR21: Cleared.</b></p>
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	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><b>Yes, in principle.</b></p> <p>An ESPM is included in Annex I. This contains clearly allocated roles and responsibilities and adequate budget provision for its implementation. Annex I included also meaningful arrangements for the supervision of the ESMP implementation at project and at field activity level. However, the ESMP includes some principles which are not part of the AF ESP.</p> <p><b>CAR11:</b> Please amend the ESMP for it to include just the 15 AF ESP principles.</p> <p>The proposal includes a meaningful grievance mechanism (Annex I), which mentions all parts of the grievance process ensuring equal accessibility, including where grievances can be accessed.</p> <p>Nevertheless, as mentioned in CAR6, the risk screening in section II is not comprehensive. Once the proposal will clarify whether there will be any Unidentified Sub-Projects (USPs), the proposal will need to include sound provisions to ensure that the USPs will also be aligned with the ESP and GP.</p>	<p><b>CAR11: Not cleared.</b> As above mentioned, the proposal should provide a strong justification as of why not all the project activities (scale and precise location) can be fully identified to a point where a comprehensive risk screening is possible. Further, if USPs are present, the ESMP should contain provisions (process and budgetary-wise) to ensure also the USPs compliance with the Fund's ESP and GP during project implementation.</p>
	4. Is a budget on the Implementing Entity Management Fee use included?	<p><b>Yes,</b> the proposal includes a table with a breakdown of the Implementing Entity Management Fee.</p>	-
	5. Is an explanation and a breakdown of the execution costs included?	<p><b>Yes,</b> the proposal includes a table with a breakdown of the Execution costs (page 130).</p>	-

	6. Is a detailed budget including budget notes included?	<p><b>Yes</b>, a detailed budget with budget notes indicating the break-down of costs at the activity level is included. In addition, adequate resources were allocated in the project budget for a gender-responsive implementation.</p> <p><b>CAR12:</b> The detailed budget table should be revised for Component 3 (which has different values US\$ 1,230,055 in the financial sections of the proposal) and total. In addition, please write the complete number corresponding to the total grant requested in the project cover page.</p>	<p><b>CAR12: Addressed</b>, as per revision in table on page 139.</p>
	7. 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?	<p><b>No</b>, the proposal includes a description of key M&amp;E milestones and suggest compliance with the Environmental and Social Policy and Gender Policy of the Fund, however it does not include a budgeted M&amp;E plan.</p> <p><b>CAR13:</b> Include a budgeted M&amp;E with provisions for mid-term and terminal evaluation and for the management of the environmental and social risks identified.</p>	<p><b>CAR13: Addressed.</b> A budgeted M&amp;E plan, covering the cost of the IE reporting requirements, has been included on page 120 as Annex 3.</p>
	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?	<p><b>No.</b></p> <p><b>CAR14:</b> In the M&amp;E section of the proposal (section D) include a table showing a budgeted M&amp;E plan with a breakdown of the IE fee for the supervision of the M&amp;E function.</p>	<p><b>CAR14: Addressed</b>, the M&amp;E plan has been included on page 120 and in Annex 3.</p>

	<p>9. Does the project/program me'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?</p>	<p><b>Yes, but needs to be revised.</b></p> <p>The proposal includes a results framework with quantified expected results; however, indicators and targets are generally lacking a gender responsive approach.</p> <p><b>CAR15:</b> Please include expected results with indicators and targets that are gender responsive and disaggregated by sex as appropriate. It is suggested to include the targets and indicators of the Gender Action Plan in the project results framework as appropriate to ensure gender mainstreaming.</p> <p><b>CAR16:</b> The proposal is aligned with the Fund's Strategic Outcomes 3,4,5 and 6. However the alignment at output level presents a few inconsistencies. For instance, under output 2.4 the Fund output indicator reported "number of WUA trained" seems related to the project and is not an indicator of the AF Strategic Results Framework. Furthermore, output 3.4 is aligned with AF output 2, but the alignment with outcome 2 is missing; alignment under outputs 3.5 and 4.1 seems also incorrect and alignment for project outputs 1.4; 2.1; 2.2 and 2.3 is missing. Please amend accordingly.</p> <p>It is suggested to also include alignment with Strategic Outcome 8 "Support the development and diffusion of innovative adaptation practices, tools and technologies", as project component 2 will promote innovative practices for water irrigation.</p> <p><b>CAR17:</b> Please include the core impact indicator "Number of beneficiaries including estimations for direct and indirect beneficiaries, as well as a second core indicator as relevant, in the project results framework. Please see the <a href="#">AF Strategic Results Framework</a> which includes the five core indicators.</p>	<p><b>CAR15: Not addressed.</b> Gender responsive and sex disaggregated indicators and target should be included especially under project component 2 and 3.</p> <p><b>CAR16: Not addressed.</b></p> <p><b>CAR17: Addressed on</b> page 122.</p>
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	10. Is a disbursement schedule with time-bound milestones included?	<p><b>Yes.</b></p> <p>Please refer to CAR 8 to adjust the amount for the IE fee as appropriate.</p>	<p><b>See CAR8 and CAR12,</b> the total value of the single tranches in the disbursement schedule add to US\$ 9,998,954 and not US\$ 9,998,955 as amended. There is also 1 \$ discrepancy in the total project direct cost which should add to US\$ 8,619,418.</p>
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ADAPTATION FUND

## ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY:

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**Country/Region:** Bhutan  
**Project Title:** Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan  
**Thematic Focal Area:** Multisector  
**Implementing Entity:** Bhutan Trust Fund for Environmental Conservation  
**Executing Entities:** Department of Agriculture & Department of Forest & Park Services Ministry of Agriculture and Forests;  
Department of Engineering Services, Ministry of Works and Human Settlements;  
Department of Local Governance, Ministry of Home and Cultural Affairs.  
**AF Project ID:** AF00000229 / BTN/NIE/Multi/2020/1  
**IE Project ID:** **Requested Financing from Adaptation Fund (US Dollars):** 9,998,955  
**Reviewer and contact person:** Martina Dorigo **Co-reviewer(s):** Imen Meliane  
**IE Contact Person:** Singye Dorji; singye@bhutantrustfund.bt

Technical Summary	<p>The project “Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan” aims to build resilience to climate change and adaptive capacity of water stressed communities in the dzongkhags (districts) of Paro and Dagana. This will be done through the four (4) components below:</p> <p><u>Component 1:</u> Adaptive management of watersheds to enhance climate resilience of communities (USD 800,000);</p> <p><u>Component 2:</u> Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation (USD 6,384,697);</p> <p><u>Component 3:</u> Climate-smart agriculture through sustainable land management and informed agro-meteorological services (USD 1,230,055);</p> <p><u>Component 4:</u> Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots (USD 204,667).</p> <p><u>Requested financing overview:</u> Project/Programme Execution Cost: USD 600,000</p>
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	<p>Total Project/Programme Cost: USD 9,219,419  Implementing Fee: USD 779,536  Financing Requested: USD 9,998,955</p> <p>The initial technical review raises some issues such as the need to further substantiate the cost-effectiveness of the selected approach, the inadequacy of environmental and social risk screening and compliance with the Fund's Environmental and Social Policy, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review.</p>
Date:	29 August 2021.

Review Criteria	Questions	Comments	Response
Country Eligibility	1. Is the country party to the Kyoto Protocol?	<b>Yes.</b>	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	<b>Yes.</b> As a Least Developed Country (LDC) with a geologically fragile and young mountain ecosystem, Bhutan is highly vulnerable to climate change and its impacts. Further, as a mountainous country with a huge area of snow and glaciers and an intricate natural drainage system of several watersheds, water catchments, rivers, rivulets and streams, the country is intrinsically exposed to and impacted by multiple climate change hazards including glacial lake outburst floods, landslides, and flash floods. Moreover, rainfall patterns are becoming increasingly erratic, leading to water scarcity in many areas and posing huge adversities for farmers who largely practice rainfed agriculture.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund	<b>Yes</b> , as per the Letter of Endorsement signed on 21 July, 2021.	

	endorsed the project/programme?	<b>CAR1:</b> The LOE refers to the Gross National Happiness Commission Secretariat as the executing entity, however this institution is not listed in the project cover page, please include it.	<b>CAR1 Response: Included GNHC as the Executing Entity</b>
	2. Does the length of the proposal amount to no more than One hundred (100) pages for the fully-developed project document, and one hundred (100) pages for its annexes?	<p><b>No.</b> While the annexes amount to 97 pages, the project document has 133 pages.</p> <p><b>CAR2:</b> Please reduce the total number of pages for the project document to 100 pages. It is noted that some information in section C and in Annex I are repeated, please consider amending as necessary.</p>	
	3. 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><b>Yes, in principle.</b> The project aims to address a major climate change vulnerability in Bhutan related to current and future freshwater availability and irrigated subsistence agriculture through an integrated approach of integrated landscape management in four dzongkhags (districts): Paro, Sarpang, Tsirang and Dagana. This approach considers the integrated watershed management, ecosystem-based adaptation and sustainable land management as sub-components to achieve its objective.</p> <p>Overall, the project seems well developed and appropriate to respond to climate risks through this systemic approach that includes improved ecosystem services from the source along the watershed, climate-resilient</p>	

		<p>infrastructure for better management of water uses by human activities, improved information systems and decision making, and linking with the most relevant level of governance. The proposal would greatly benefit from the inclusion of a Theory of Change graph which would display the suitability of the proposed activities in different sectors to the threats posed by the likely climate scenarios.</p> <p>Much of the requested funding would go to concrete adaptation activities of water infrastructures for uninterrupted supply of water for drinking and irrigation purposes, with the other activities being designed to facilitate the success of climate-resilient infrastructure.</p> <p>The project activities support the Fund's Strategic Objectives 3, 4, 5 and 6.</p> <p>However, further information is needed for the following aspects:</p> <p><b>CR1:</b> Overall the proposal does not specify the possible set of adaptation interventions under outcome 1. There is only a reference to conservation/restoration activities (output 1.3). Please provide details on the type, scale and location for the envisaged activities.</p> <p>Under component 1, the project aims to</p>	<p><b>CR1 Response:</b>The activities will be implemented in the degraded/critical watersheds and water sources drying areas. While we cannot define the scale</p>
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		<p>upscale Payment for Ecosystem Services (PES) schemes in two of the project districts, which would empower communities in the natural resources' management.</p> <p><b>CR2:</b> Please clarify the institutional arrangements that will need to be put in place for the operationalization of the PES schemes, taking into account any lesson learned from the four schemes already established at national level.</p> <p>The proposal mentions that the project will carry out detailed assessment of watersheds in the project dzongkhags (districts) to define prioritized watersheds for interventions by mid-term. Further it states, "an exhaustive list of appropriate interventions will be identified, consulted and implemented". Comprehensive formulation of project activities requires that the nature of an activity as its precise location in terms of environment and social setting are known. Climate resilient water and irrigation infrastructure include the construction and rehabilitation of six drinking water supply schemes; construction of at least two pressurized/closed irrigation systems; re-engineering/rehabilitation or improvement of four existing irrigation systems; scale-up micro-irrigation systems; small earthen check dams and ponds and reservoirs.</p> <p><b>CR3:</b> Please clarify whether the</p>	<p><b>due to lack of proper assessment, the activities will include both biological and physical measures such as SLM activities, establishment of Check dams, plantations of site appropriate grasses/trees and other land stabilization, watershed conservation and water source revival activities, etc.</b></p> <p><b>CR2 Response:</b>We have adequate institutional arrangements in place. Numerous acts, policies and legislations right from Constitution of the kingdom of Bhutan, Water Act of Bhutan, National Environment Protection Act, National Forest Policy to name few support implementations of PES directly or indirectly. In addition, we have PES Framework and PES Field Guide developed to help upscale PES.</p>
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		<p>nature/quantity and precise location for the concrete adaptation investments is still not defined. If the location and technical nature of investments is not clear, the project presents Unidentified Sub-Projects (USPs) and this approach should be clearly justified (i.e. impossibility of identifying adaptation measures during as part of the project design).</p> <p><b>CR4:</b> The proposal mentions that a watershed management plan is already developed in Dagana district, with some activities already undergoing in some geogs (villages). Activity 1.1.3 reports that the project will conduct one detailed watershed assessment per district. Given that Dagana has already a watershed management plan, can you clarify how the project will build on it?</p> <p><b>CR5:</b> Output 1.3 “Water sources recharge interventions adopted” allocates a budget line for monitoring and maintenance of conservation/restoration activities. Can you specify by whom will this work be conducted?</p> <p><b>CR6:</b> Under output 2.1, please specify how the database for the water inventory will be managed and how it will be maintained after the project finalization?</p>	<p><b>CR3 Response:</b>We conduct rapid assessments to limit waste of time &amp; resources, but to help identify areas of concern to focus. Doing detailed assessment altogether will waste both time and resources as there will be areas where interventions are not required. Therefore, detailed assessments are required to identify what activities and where they are needed for effective implementation</p> <p><b>CR4 Response:</b>The plan we have in Dagana does not include the whole district, it is only for one watershed which covers parts of three Geogs. We will use the experiences gained from the current plan to efficiently plan</p>
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		<p>How will the information be accessible to different stakeholders?</p>	<p><b>and implement the required activities in the identified areas.</b></p> <p><b>CR5 Response:</b> The activities will be implemented by Forestry agencies located in the locality. For that matter, all the implementations will be carried out by those agencies in collaboration with relevant stakeholders.</p> <p><b>CR6 Response:</b> The database will be used to understand the water resource landscaping in the country and it will act as a point of reference to validate future study and analysis. It will be shared with the stakeholder during the knowledge sharing workshop and the reports shall be made available on our website. The existing information system “WaSIS (Water and Sanitation Information Systems)” managed by the Water and Sanitation Division, MoWHS shall be reviewed and strengthened. The data input shall be provided by the respective Local Governments and shall be updated periodically. The information from WaSIS shall be shared with the key stakeholders as and when required. After the project finalization, it will be integrated into</p>
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			the national and local government plans and program and will be used for plans.
	<p>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?</p>	<p><b>Not clear.</b>          With a geologically fragile and young mountain ecosystem and as a least developed country, Bhutan is highly vulnerable to climate change and its impacts. To sustain agriculture, new sources of water must be identified locally, tapped into and invigorated, and innovation is required in water storage, including water harvesting, and usage. The proposal outlines in a general way the benefits that the project will provide.  <b>CR7:</b> Please provide, wherever feasible, estimated quantification of benefits, especially the economic benefits.          The proposed project is expecting to benefit 5,297 households or over 30,215 direct beneficiaries. However, it does not specify whether there are any indigenous communities in the project target areas.</p> <p><b>CR8:</b> Clarify how the project will ensure an equitable distribution of benefits to vulnerable communities, households and marginalized and indigenous groups and clearly outline them.          The proposal includes a Gender Assessment and Gender Action Plan</p>	<p><b>CR7 Response:</b> Addressed under B: Environment and social benefits. In Bhutan, we do not have any indigenous communities in the country. We consider One King, One Country and One People concept and all Bhutanese are treated equally under our Constitution.</p>



		<p>(GAP) (Annex 2) outlining the different needs, capabilities, roles and knowledge resources of women and men. The GAP includes clear recommendations on how to mainstream gender into the project activities. However, the recommendations seem not to be fully reflected into the project document.</p> <p><b>CAR3:</b> Please include information on how the project will practically mainstream gender throughout its components (in the section of the project outputs' description), to ensure alignment with the GAP.</p>	<p><b>CR8Response:</b> YES. Vulnerable and marginalized groups identified by these consultations are identified as households characterize by isolated and dotted settlements; communities without motorable access road; households with only elderly members &amp; without households labour force; households with alcoholic heads; household with very few household members; Households with empty or no resident members; women and divorcee headed households. These vulnerable groups may not be able to actively participate in the project such as in consultations, community labour contribution to and other forms of participation and may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities.</p> <p>.</p>
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			<p><b>CAR 3 Response:</b> Addressed under activity 2.4.1 and 2.4.2 and under Institutional arrangements</p>
	<p>5. Is the project / programme cost effective?</p>	<p><b>Needs to be further substantiated.</b></p> <p>Albeit the project provides a good justification for cost-effectiveness of the proposed measures against a business-as-usual scenario, and the system-wide scope and approach of integrated watershed management overall seems logical and well-suited for cost-effectiveness and project sustainability, the proposal generally lacks information on alternative approaches to water management considered or used. In addition, more quantitative and detailed data is needed to support the cost-effectiveness.</p> <p><b>CAR4:</b> Please include information on alternative measures that could have taken place instead of the selected approach, which are now described only for project component 2.</p> <p><b>CR9:</b> Consider including more quantitative data to support the cost-</p>	<p><b>CAR4 Response:</b> Addressed under Section C of Part II.</p> <p><b>CR9 Response:</b> As justified above under CAR 4.</p>

		effectiveness of the selected approach compared to the alternative measures.	
	6. 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 relevant instruments?	<p><b>Yes.</b> The proposal is in line with the Royal Government of Bhutan's Water Flagship Program, Bhutan's National Development Plan (it will contribute to five of the 17 National Key Areas). Furthermore, is in line with the National Environment Strategy 2020, and with the National Agriculture Sector's 12<sup>th</sup> Five Year Plan. The country first National Adaptation Plan with a focus on the water sector is under development.</p> <p><b>CR10:</b> Please clarify the link of the proposed project to climate/adaptation-relevant strategies, if such instruments exist, e.g. NAPAs, NDCs.</p>	<b>CR 10 Response:</b> Clarified under part II, section D.
	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	<p><b>Not clear.</b> Relevant national technical standards are identified nevertheless the steps taken to comply with them and the nature of the authorization/clearance granted for the project to be implemented is not provided.</p> <p><b>CR11:</b> Please clarify how compliance with the listed technical standards in the proposal will be practically ensured.</p>	<b>CR11 Response:</b> Addressed under part II, section E
	8. Is there duplication of project / programme with other funding sources?	<p><b>Unclear.</b></p> <p>The proposal provides general information on how it will be complementary to existing and pre-</p>	

		<p>approved projects, including with GCF and GEF-LDCF, however more specific information is lacking.</p> <p><b>CR12:</b> Clarify how the project will create practical synergies and how duplication will be avoided with the GCF project “Supporting Climate Resilience in the Agriculture Sector in Bhutan”, since two of the target districts are the same. Consider establishing a framework for cooperation/coordination during implementation.</p> <p>The proposal mentions that the National Soil Services Centre, has implemented a number of SLM project through various donors (GEF; UNDP-SGP). These projects piloted and scaled-up climate smart agriculture with a focus on SLM measures.</p>	<p><b>CR12 Response:</b> The GCF Project 'Supporting Climate Resilience in the Agriculture Sector' targets 8 dzongkhags where the project locations are spread widely. GCF-Agri project in Sarpang covers gewogs of Sershong, Umling, Samtenling and Sompangkha. The two gewogs of Sershong and Chuzergang under the AF project (which happens to be the project location of the GCF Project) will be carried out in such a manner that the chiwogs (sub-block/village) uncovered will be materialized.</p> <p>In Tsirang, GCF Project envelops Mendrelgang, Kikorthang, and Sergithang which are beyond the project scope of AF.</p> <p>Under Dagana, GCF covers Dorona, Khebisa and Lhaimoizingkha. AF interventions in these gewogs will be concentrated in SLM as water schemes are currently being financed through GCF support.</p> <p>The synergies between these projects will be ensured by carrying out consultative process between the projects in implementation to inform each other of the best</p>
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		<p>practices emerging out of the projects. GNHC as the central coordinating agency will ensure coordination framework between two projects are put in place by leveraging the existing practice such as national and annual implementation month and performance agreement of the agencies.</p> <p>Overall, since the implementing entity for both the GCF project and AF project is based at the GNHC (as NDA and DA to GCF and AF respectively), the projects will be coordinated systemically through better collaboration and non-duplication, ensured mostly through the PMU coordination.</p> <p><b>CR13 Response:</b> The key lessons learned from the past and ongoing SLM projects which were taken into account during project design or will certainly be adopted during project implementation are:</p> <ul style="list-style-type: none"><li>● <b>Participatory SLM Action Planning</b> – This planning methodology has enhanced community ownership and</li></ul>
	<p><b>CR13:</b> Clarify how are lessons learned and best practices from these projects</p>	

		have been taken into account into this project's design.	<p>commitment; promoted inclusion of all households in decision-making process; and helped build community capacity.</p> <ul style="list-style-type: none"><li>● <b>Group approach in implementing SLM measures</b> – Promoting informal groups or reviving traditional labour sharing groups was found very useful in implementing SLM activities that are labour intensive, e.g. hedgerows, stone bunds, checkdam construction and orchard establishment. Such approach was particularly helpful to those families with less labour force, women headed, aged and disabled family, and resource poor households. Besides, the approach has also generated other social co-benefits such as community cohesion and trust, exchange of experiences and benefits</li></ul>
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			<p>through collective action against conventional individual household approach.</p> <ul style="list-style-type: none"><li>● <b>Reaching all versus focused approach</b> – One lesson learned has been with regards to reaching out project resources to all the communities and households versus focusing the interventions. The problem with reaching out project support to all is the dilution of impact due to too many activities and spreading out resources too thinly. That way, there is no visible impact or transformational change at the end of the project period. Realising this, a focused approach was adopted which resulted better resource utilization and bigger impact in the field.</li><li>● <b>SLM best practices</b> – The problem with many SLM interventions is the long</li></ul>
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			<p>period needed before the impact of interventions become tangible and start contributing to the beneficiaries' livelihoods. Most SLM interventions take a considerable time between the initial investment and the actual benefit, which is an opportunity costs to most of the land owners, especially so to the resource poor farmers having small landholdings. Therefore, the long term SLM interventions were supported with provision of inputs for direct short term benefits such as improved seeds, incentives and material supports including simple tools &amp; implements, small labour saving machineries, etc. machiwith short term cash income generating activities.</p>
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		<p><b>CAR5:</b> Include the IFAD funded project “Commercial Agriculture &amp; Resilient Livelihood Enhancement Program” and the World Bank project “Food Security &amp; Agriculture Productivity Project” in the list of potentially overlapping projects and</p>	<p><b>CAR5 Response:</b> Addressed under section F of part II.</p>
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		<p>state in a clear manner how complementarity and lack of overlap will be ensured.</p> <p>You might want to consider displaying the list of all the past and current projects, including their brief description and how the proposed project will practically ensure synergies, ensure that any earlier lessons, if relevant to the project, are taken into account, and/or avoid overlap in a table format.</p>	
	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	<p><b>Yes.</b> The project does not include a separate knowledge management component, but knowledge management is well integrated into all the project components. Specifically, it will seek to establish and strengthen the existing knowledge management system and establish appropriate models of communication. Key lessons learned and best practices will be documents for wider dissemination and policy mainstreaming.</p>	
	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	<p><b>Not clear.</b></p> <p>A gender-responsive consultative process has taken place in the four district target areas and respective villages (two villages were not consulted due to COVID-19 restrictions). This led to the development of the Gender assessment and Gender Action Plan.</p> <p><b>CR14:</b> Please clarify whether</p>	<p><b>CR 14 Response: Addressed and</b></p>

		<p>consultations addressed also environmental and social safeguards process and outcomes, as Annex 2 findings are related to gender only.</p> <p>While the proposal includes a list of consultations undertaken at local level (Annex II) including a list of participants, it is unclear which institutions were consulted at national level and how the outcomes of such consultations were integrated into the project's design.</p> <p><b>CR15:</b> Please include information documenting the consultative process, including the list of stakeholders already consulted (principles of choice, date of consultation), b) a description of the consultation techniques (tailored specifically per target group), and c) the key consultation findings (in particular suggestions and concerns raised).</p> <p><b>CR16:</b> Please clarify whether there are any indigenous people in the project target areas, and if any, specify whether these groups were consulted and how their views/concerns are taken into account into the project's design.</p>	<p><b>YES.</b></p> <p><b>CR 15 Response: Addressed.</b></p> <p><b>CR 16 Response:</b>  <b>YES. Vulnerable and marginalized groups identified by these consultations are identified as households characterize by isolated and dotted settlements; communities without motorable access road; households with only elderly members &amp; without households labour force; households with alcoholic heads; household with</b></p>
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			very few household members; Households with empty or no resident members; women and divorcee headed households. These vulnerable groups may not be able to actively participate in the project such as in consultations, community labour contribution to and other forms of participation and may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities.
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	<b>Yes.</b> The proposal proves that the planned activities alone, without additional funding, will allow the achievement of the set adaptation objective and the additionality of the proposed measures is adequately described.	
	12. Is the project / program aligned with AF's results framework?	<b>Yes</b> , as mentioned above, the proposal is aligned with the Fund's Strategic Outcomes 3,4, 5 and 6. Please see CAR17 below for potential adjustments.	
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	<b>Not clear.</b> Sustainability has been informed including institutional and financial sustainability of project outcomes. Sustainable Land Management and Agriculture Land Development activities are mainstreamed into central and local government plans	

		<p>and programs.</p> <p><b>CR17:</b> Please specify how will the database for the water inventory (under output 2.1) be managed and how it will be maintained after the project finalization as per the above comment.</p> <p><b>CR18:</b> In addition, please clarify the arrangements through which the sustainability and maintenance of the water infrastructure to be installed will be ensured.</p> <p>The proposal would also benefit from informing how the knowledge management generated will support replication of successful interventions.</p>	<p><b>CR17 Response:</b> Through this project, development of a database system for drinking water, strengthening and formation of WUAs, and climate proofing water infrastructures would be implemented by bringing the village headmen and other stakeholders on board.</p> <p><b>CR18 Response:</b> To ensure sustainability of the schemes, formation of water user associations is proposed as part of the project which will be institutionalized and the operation and maintenance aspects of the scheme after project finalization will be integrated into local government plans.</p>
	<p>14. 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>	<p><b>Not adequately.</b></p> <p>As mentioned above, it is not clear whether the precise locations for the concrete adaptation investments are yet to be identified. The proposal needs to clarify that aspect (see CR 3). If the proposal contains USPs, this approach is not justified nor this is acknowledged in the environmental and social risk screening.</p> <p><b>CR19:</b> The proposal needs to include adequate provisions to ensure that the</p>	<p><b>CR19 Response:</b></p>

		<p>USPs will also be compliant with the ESP. Please remember that USPs are acceptable only on exceptional basis and their use must be well-justified. You might want to refer to this guidance document: <a href="https://www.adaptation-fund.org/wp-content/uploads/2021/05/AFB.B.32-33.7_Compliance-with-ESP_Update-of-PPR_and_Guidance-for-USPs_revised.pdf">https://www.adaptation-fund.org/wp-content/uploads/2021/05/AFB.B.32-33.7 Compliance-with-ESP Update-of-PPR and Guidance-for-USPs revised.pdf</a></p> <p>The proposal was classified as category B as it presents some potential environmental and social risks, however the environmental and social risk screening does not include all the potential direct and indirect risks which it might entail, therefore the risk findings are not substantiated. Further, this section lacks a narrative summary of how the risks conclusions were made, for each principle.</p> <p><b>CAR6:</b> Please provide a comprehensive risk identification in line with the Fund's Environmental and Social Policy, including a justification for each risk finding. For the risks identified, an environmental and social impact assessment should be carried out. The assessment should consider all potential direct, indirect and cumulate impacts that could result from the proposal project.</p> <p>Further, the ESP risks need to be</p>	<p><b>CAR 6 Response:</b>Addressed under section K of part II</p>
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		<p>identified based on the 15 AF ESP principles (page 103 mentions that project categorization has been done based on the significance of risks on the 16 principles). Section C states that the project has been screened through the NIE's Environment and Social Safeguards and Gender Screening Tool and risks were identified against each project activity. This is not in line with provisions set forth in the AF Environmental and Social Policy (ESP). Finally, some of the risks identified pertain to project management risks (e.g., impact of COVID-19 pandemic impacting travel).</p> <p><b>CAR7:</b> Please remove any inconsistency between the risk screening table (section K) and the ESS risk categorization tables (pages 103-104 and Annex I), since the risks findings are not aligned.</p> <p><b>CR20:</b> The proposal states that since most of the SLM benefits can be seen in the long-term, oftentimes farmers are discouraged to adopt SLM practices. Further, the proposal states that this issue will be addressed through offering short-term benefits, please clarify what would they be.</p>	<p><b>CAR 7 Response:</b> Removed.</p> <p><b>CR 20 Response:</b> Short term benefits include support in terms of seeds (vegetables &amp; leguminous crops to improve soil fertility) and fruit tree seedlings to improve land cover &amp; enhance cash income.</p>
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Resource Availability	1. Is the requested project / programme funding within the cap of the country?	<b>Yes.</b>	
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	<p><b>Yes, the implementing entity fee amounts to 8.5% of the total budget before the fee, however there are a few discrepancies to be corrected in the financial sections of the proposal.</b></p> <p><b>CAR8:</b> The project component and financing table (page 15) has a different amount US\$ 779,535 for the Implementing Entity fee from the one reported in the detailed budget and disbursement schedule, which is US\$ 779,536. Please amend as necessary.</p>	
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	<b>Yes, project execution costs amount to 6.5% of the total project budget.</b>	
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	<b>Yes, through the Bhutan Trust Fund for Environmental Conservation which is an accredited National Implementing Entity.</b>	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management,	<p><b>Yes.</b></p> <p>The proposed implementation</p>	



	in compliance with the Gender Policy of the Fund?	<p>arrangements include a clear description of the roles and responsibilities of the implementing entity as well as the executing entities that are involved in the project. The PMU in the organization chart includes an M&amp;E officer, nevertheless the Safeguards and Gender Specialist, which will be responsible for overseeing implementation of field activities related to the Gender Action Plan, is not listed.</p> <p><b>CAR9:</b> Include the Safeguards and Gender Specialist in the PMU, as indicated in the Gender Action Plan.</p>	<b>CAR 9 Response:</b> Addressed.
	2. Are there measures for financial and project/programme risk management?	<p><b>Yes, largely adequate.</b></p> <p>The proposal includes a table which identifies all major risk categories, consider their significance, and include adequate mitigation measures.</p> <p><b>CAR10:</b> Please consider including a risk related to the possible impact of COVID-19 restrictions on project timely implementation and related mitigation measures.</p>	<b>CAR 10 Response:</b> Bhutan is very lucky under the dynamic leadership of His Majesty The King of Bhutan and we have vaccinated 90% (Ministry of Health website) of our population and we are optimistic things would be far better-off during the project implementation.

		<b>CR21:</b> Please clarify whether any of the risk categories considers the feasibility in developing the two PES schemes and related mitigation measures.	<b>CR 21 Response:</b> There is no issue with regard to PES as some of the ongoing PES activities have proven to be very effective and successful in the country.
	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><b>Yes, in principle.</b> An ESPM is included in Annex I. This contains clearly allocated roles and responsibilities and adequate budget provision for its implementation. Annex I included also meaningful arrangements for the supervision of the ESMP implementation at project and at field activity level. However, the ESMP includes some principles which are not part of the AF ESP.</p> <p><b>CAR11:</b> Please amend the ESMP for it to include just the 15 AF ESP principles. The proposal includes a meaningful grievance mechanism (Annex I), which mentions all parts of the grievance process ensuring equal accessibility, including where grievances can be accessed.</p> <p>Nevertheless, as mentioned in CAR6, the risk screening in section II is not comprehensive. Once the proposal will clarify whether there will be any Unidentified Sub-Projects (USPs), the proposal will need to include sound provisions to ensure that the USPs will also be aligned with the ESP and GP.</p>	
	4. Is a budget on the Implementing Entity	<b>Yes,</b> the proposal includes a table with a breakdown of the Implementing Entity	

	Management Fee use included?	Management Fee.	
	5. Is an explanation and a breakdown of the execution costs included?	<b>Yes</b> , the proposal includes a table with a breakdown of the Execution costs (page 130).	
	6. Is a detailed budget including budget notes included?	<p><b>Yes</b>, a detailed budget with budget notes indicating the break-down of costs at the activity level is included. In addition, adequate resources were allocated in the project budget for a gender-responsive implementation.</p> <p><b>CAR12:</b> The detailed budget table should be revised for Component 3 (which has different values US\$ 1,230,055 in the financial sections of the proposal) and total. In addition, please write the complete number corresponding to the total grant requested in the project cover page.</p>	<b>The Budget table has been revised.</b>
	7. 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?	<p><b>No</b>, the proposal includes a description of key M&amp;E milestones and suggest compliance with the Environmental and Social Policy and Gender Policy of the Fund, however it does not include a budgeted M&amp;E plan.</p> <p><b>CAR13:</b> Include a budgeted M&amp;E with provisions for mid-term and terminal evaluation and for the management of the environmental and social risks identified.</p>	<b>CAR13 Response: Addressed under Annex 3</b>

	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?	<p><b>No.</b></p> <p><b>CAR14:</b> In the M&amp;E section of the proposal (section D) include a table showing a budgeted M&amp;E plan with a breakdown of the IE fee for the supervision of the M&amp;E function.</p>	<b>CAR14 Response:</b> Addressed.
	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?	<p><b>Yes, but needs to be revised.</b></p> <p>The proposal includes a results framework with quantified expected results; however, indicators and targets are generally lacking a gender responsive approach.</p> <p><b>CAR15:</b> Please include expected results with indicators and targets that are gender responsive and disaggregated by sex as appropriate. It is suggested to include the targets and indicators of the Gender Action Plan in the project results framework as appropriate to ensure gender mainstreaming.</p> <p><b>CAR16:</b> The proposal is aligned with the Fund's Strategic Outcomes 3,4,5 and 6. However the alignment at output level presents a few inconsistencies. For instance, under output 2.4 the Fund output indicator reported "number of WUA trained" seems related to the project and is not an indicator of the AF Strategic Results Framework. Furthermore, output 3.4 is aligned with</p>	<p><b>CAR 15 Response:</b> Addressed.</p> <p><b>CAR 16 Response:</b></p>

		<p>AF output 2, but the alignment with outcome 2 is missing; alignment under outputs 3.5 and 4.1 seems also incorrect and alignment for project outputs 1.4; 2.1; 2.2 and 2.3 is missing. Please amend accordingly.</p> <p>It is suggested to also include alignment with Strategic Outcome 8 “Support the development and diffusion of innovative adaptation practices, tools and technologies”, as project component 2 will promote innovative practices for water irrigation.</p> <p><b>CAR17:</b> Please include the core impact indicator “Number of beneficiaries including estimations for direct and indirect beneficiaries, as well as a second core indicator as relevant, in the project results framework. Please see the <a href="#">AF Strategic Results Framework</a> which includes the five core indicators.</p>	<p><b>CAR 17 Response:</b> An indicator on the number of direct and indirect beneficiaries by gender is incorporated under section E. Project Results Framework</p>
	10. Is a disbursement schedule with time-bound milestones included?	<p><b>Yes.</b></p> <p>Please refer to CAR 8 to adjust the amount for the IE fee as appropriate.</p>	



ADAPTATION FUND

## PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

### PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	Regular Project
Country/ies:	Bhutan
Title of Project/Programme:	Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan
Type of Implementing Entity:	National Implementing Entity
Implementing Entity:	Bhutan Trust Fund for Environmental Conservation
Executing Entity/ies:	Department of Agriculture & Department of Forest & Park Services Ministry of Agriculture and Forests  Department of Engineering Services, Ministry of Works and Human Settlements  Department of Local Governance, Ministry of Home and Cultural Affairs  Gross National Happiness Commission
Amount of Financing Requested:	9,998,955 (in U.S Dollars) Equivalent

## Acronyms

ADSS	Agro-met Decision Support System
AF	Adaptation Fund
ALDG	Agriculture Land Development Guidelines
ARED	Agriculture Research and Extension Division
BDWQS	Bhutan Drinking Water Quality Standards
BT FEC	Bhutan Trust Fund for Environmental Conservation
CCA	Climate Change Adaptation
CCP	Community Contracting Protocol
DES	Department of Engineering Services
DLG	Department of Local Governance
DPA	Department of Public Accounts
DRR	Disaster Risk Reduction
ESMP	Environment and Social Management Plan
FNCRR	Forest and Nature Conservation Rules and Regulations
FYP	Five Year Plan
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNH	Gross National Happiness
GNHC	Gross National Happiness Commission
HDPE	Hydro-pressurized Pipe
HKH	Hindu Kush Himalayan
IEE	Initial Environmental Examination
IPCC	Inter-governmental Panel on Climate Change
KM	Knowledge Management
LDCF	Least Developed Countries Fund
LG	Local Government
MoAF	Ministry of Agriculture and Forests
MoHCA	Ministry of Home and Cultural Affairs
NAPA	National Adaptation Program of Action
NECS	National Integrated Water Resources Management Plan
NIMP	National Irrigation Master Plan
NKRA	National Key Result Areas
NWFP	Non-Wood Forest Products
PES	Payment for Ecosystem services
PHCB	Population and Housing Census of Bhutan
PRA	Participatory Rural Appraisals
RGoB	Royal Government of Bhutan
RNR	Renewable Natural Resources
RWSS	Rural Water Supply Scheme
SAPA	Sector Adaptation Plan of Action
SLM	Sustainable Land Management
WMD	Water Management Division
WTP	Water Treatment Plant
WUA	Water Users Association

## Project Background and Context:

### General Country Information

The Himalayan Kingdom of Bhutan is a small land-locked country with a population of 727,145 (PHCB 2017<sup>1</sup>) and a geographic area of 38,394 km<sup>2</sup>. The country is almost entirely mountainous with nearly 95 percent of the country being above 600 meters altitude<sup>2</sup>. The topography is rugged and steep, with elevation rising from under 200 m to above 7,500 m within a short south-north distance of some 170 kilometers (km). The country can be distinguished into three broad physiographic zones: the southern belt made up of the Himalayan foothills adjacent to a narrow belt of flatland along the Indian border; the inner Himalayas consisting of main river valleys and steep mountains; and the high Himalayas featuring alpine meadows and snow-capped mountains.

Administratively, the country is made up of 20 dzongkhags (districts, see Figure 1). Each dzongkhag consists of gewogs, which are a block of villages and represent the smallest unit of public administration. There are altogether 205 gewogs across the country. Some of the dzongkhags are broken down into dungkhags (sub-districts) to ease geographical and logistical constraints posed on public administration. Currently, there are 16 dungkhags. Major population centers are located in the west and south. The northern region is very sparsely populated. Sixty-two per cent of the population live in rural areas and predominantly subsist on a farming system, which integrates crop agriculture, livestock rearing and forest resource use.

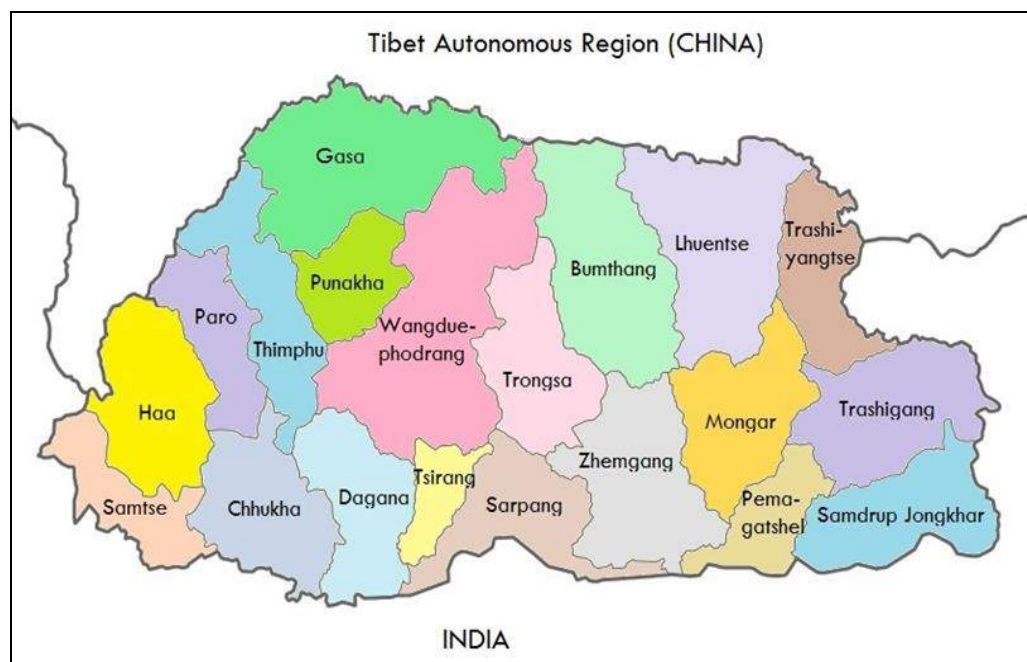


Figure 1: Administrative map of Bhutan showing the districts

<sup>1</sup> Population and Housing Census of Bhutan 2017, National Statistics Bureau, Royal Government of Bhutan

<sup>2</sup> Atlas of Bhutan: Land Cover and Area Statistics, 1997, Ministry of Agriculture, Royal Government of Bhutan



The advent of the Five-Year Plan (FYP) in 1961 marked the beginning of modern development. Since then, FYPs have served as the key strategic instrument for the implementation of national development policies and programs. The country is currently implementing the 12<sup>th</sup> FYP (November 2018-October 2023) with overall objective to create “a just, harmonious and sustainable society through enhanced decentralization.” The national development process is guided by the overarching development philosophy of “Gross National Happiness”. This philosophy is underpinned by the four central and mutually-reinforcing objectives of equitable socio-economic development, environmental sustainability, promotion and preservation of culture, and good governance.

Bhutan’s economy is one of the smallest in the world but one that has seen impressive growth over the years. The country’s Gross Domestic Product (GDP) has grown from Nu. 72,496.64 million (US\$ 1,565.8 million) in 2010 to Nu. 167,326.82 million (US\$ 2,464.3 million) in 2018, up by about 130 percent<sup>3</sup>. The key contributing economic sectors to the GDP are renewable natural resources, which includes agriculture, livestock rearing and forestry (15.89 percent), construction (14.2 percent) and electricity and water (11.72 percent)<sup>4</sup>. In terms of employment, the renewable natural resources sector remains the most important economic sector although its GDP share has been falling over the years. Tourism is another sector contributing significantly to the country’s economy particularly in terms of foreign exchange and creation of jobs.

The country is endowed with an outstanding natural environment. It is dubbed as the ‘crown jewel’ of the Eastern Himalayas, a region recognized as a global biodiversity hotspot. Broadly speaking, the natural habitats range from the subtropical broadleaf forests and grasslands through temperate mountain forests to alpine meadows and scree interspersed with marshlands and various water bodies. The natural habitats are home to more than 5,600 species of vascular plants, about 200 species of mammals, 700 species of birds, and some 100 species of fish. To maintain the rich biodiversity, 42.7 percent of the country has been declared as protected areas, which include five national parks, four wildlife sanctuaries and a strict nature reserve. These protected areas are connected by biological corridors to ensure contagiousness of the natural habitats and allow wildlife movements between the protected habitats, expanding the network of natural areas under protection to more than 50 percent of the country.

Forests account for more than 70 percent of the country’s land cover – one of the highest in the world. The Constitution mandates that at least 60 percent of the country is maintained under forest cover at all times. As a result of vast tracts of forest cover, low level of polluting industrial activity and almost all electricity generated from hydropower, Bhutan is perhaps the only country in the world with net greenhouse gas (GHG) emission in negative. The net GHG emission is estimated to be -4,750.04 Gigagram (Gg) of CO<sub>2</sub> equivalent based on 2000 data<sup>5</sup>. This, however, does not exempt the country from the impacts of global warming and climate change.

In fact, with a geologically fragile and young mountain ecosystem and as a least developed country, Bhutan is highly vulnerable to climate change and its impacts. Socio-economic development is hugely dependent on climate-sensitive sectors such as agriculture, hydropower, forestry, and road communication. Furthermore, as a mountainous country with a huge area of snow and glaciers and an intricate natural drainage system of several watersheds, water catchments, rivers, rivulets and streams, the country is intrinsically exposed to and impacted by multiple climate change hazards

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<sup>3</sup> National Accounts Report 2019. The USD conversions are based on historical USD-BTN exchange rates prevailing in 2010 and 2018 respectively ([www1.oanda.com](http://www1.oanda.com)).

<sup>4</sup> The figures are for 2018 as cited in the National Accounts Report 2019.

<sup>5</sup> Second National Communication to the UNFCCC, November 2011. More recent data will be available in the Third National Communication, which is currently under preparation.

including glacial lake outburst floods, landslides, and flash floods. Reduced precipitation during winter over the recent years has given rise to increased forest fire risks and seasonal water scarcity in many areas. Rainfall pattern is becoming increasingly erratic, posing huge adversities for farmers who largely practice rain-fed agriculture. Severe events of windstorm are becoming increasingly recurrent and these have damaged numerous homes, schools, health facilities, government offices, and temples, as well as tons of crops.

## Climate and Climate Change Scenarios

The climate varies considerably in Bhutan due to its characteristic of dramatic changes in topography. The southern foothills typically have subtropical climate with high humidity and heavy rainfall with several locations recording more than 4,000 mm annual rainfall. The temperature in the southern region ranges from 10°C to 25°C in winter and 20°C to 35°C in summer. The central mountains and valleys are characterized by cool winters and warm summers with temperature ranging from -5°C to 15°C in winter and 15°C to 25°C in summer. Rainfall in this region is moderate between 1,000-2,000 mm per year. The high alpine mountains and meadows have cold winters and cool summers with generally low precipitation of less than 500 mm per year primarily in the form of snow.

The summer monsoons endure from late June through late September. The moisture-laden clouds that originate in the Bay of Bengal travel north towards the Himalayas. When these clouds are blocked from traveling further by the high Himalayas, they bring heavy rainfall to the region. The monsoons play a critical role in the life of the people of this region. Most of the farmers are totally dependent on the monsoons for irrigation. The late onset of the monsoons can lead to drought in the region while excessive monsoon rains can result in flash floods and landslides.

The second (SAR 1990), third (TAR 2001), fourth (AR4 2007) and fifth (AR5 2014) assessment reports produced by the Inter-Governmental Panel on Climate Change (IPCC) indicate that mountainous countries such as Bhutan, are likely to be among the countries most vulnerable to the adverse impacts of climate change. The IPCC and other climate based reports have identified a number of sources of vulnerabilities that mountainous countries will face in relation to climate change and variability, including their size and limited resource base, vulnerability to existing weather events such as heavy monsoonal rain, dry-season drought, tropical storms such as cyclones and restricted economic opportunities.

Simulated exercises using ECHAM5 and HadCM3Q0 climate models for projection of long-term climate scenarios, carried out as a part of the Second National Communication (2011), suggest the following:

- **Change in temperature:** Mean annual temperature for the 2010-2039 is projected to increase by ~0.8°C (ECHAM5/A1B scenario) to ~ 1.0 °C (HadCM3QO/A1B scenario) compared to the current (1980-2009) climate. There is little or no difference between the annual and seasonal (monsoon and winter) temperature changes according to the ECHAM5/A1B scenario whereas HadCM3QO/A1B scenario projects a slightly higher increase in mean winter seasonal temperature (~1.2°C) and a slightly lower increase in mean monsoon seasonal temperature (~0.8°C). For the 2040-2069 period, mean annual temperature is projected to increase by ~2.0°C (ECHAM5/A1B scenario) to ~2.4 °C (HadCM3QO/A1B scenario). Again, there is little or no difference between the annual and seasonal (monsoon and winter) temperature changes according to the ECHAM5/A1B scenario but HadCM3QO/A1B scenario projects a slightly higher increase in mean winter seasonal temperature (~2.8°C) and a slightly lower increase in mean monsoon seasonal temperature (~2.1°C).

- **Change in precipitation:** As for changes in mean annual precipitation, both ECHAM5/A1B and HadCM3Q0/A1B scenarios project a slight increase of ~6% for the 2010-2039 period. On a seasonal basis, there is a slight decrease in winter precipitation (~2%) and an increase of 4-8% in the monsoon period. For the 2040-2069 period, the ECHAM5/A1B scenario projects an increase of ~25% in the mean total annual precipitation with a generally higher increase in the monsoon compared to the winter season. The HadCM3Q0 also projects almost a similar scenario: an increase of ~21% with a generally higher increase in the monsoon than in the winter season. The general projection is thus that the mean annual precipitation will see an increase over the next 30 to 60 years but with more intense and concentrated rainfall in the monsoon season and an in general drier winter season.

## Climate Change Impacts on Water and Agriculture

As presented in the previous section, there is a projected increase in annual average rainfall in Bhutan. The additional rain, however, will mostly fall during the existing wet season of June to August when it is often not required to improve crop yields (though more evenly distributed rainfall within these months would likely reduce the incidences of yield declines due to dry spells during pollination of some crop species). Similarly, for aquifer recharge, the higher intensity of rainfall events generally leads to extra surface run-off rather than infiltration once the soil is saturated, limiting the benefits of the extra amount of projected precipitation. It is thus likely that the increases in rainfall projected between June and August by the climate models will only serve to exacerbate problems associated with erosion, landslides and floods.

Furthermore, the projected increases in rainfall variability can lead to decreases in precipitation for extended periods, causing water availability and access problems, which undermine current water distribution infrastructure and communities' abilities and rights to access water for household and agricultural requirements. Springs and small streams are the main water sources for the rural part of the country. But many of them are reportedly retreating. The updated National Adaptation Program of Action (NAPA 2012) therefore also prioritized water as a sector most likely to be severely affected by climate change, with far-reaching implications relating to drought, floods, access to water and water quality. The NAPA 2012 therefore includes actions for (g) Rainwater Harvesting and Drought Adaptation. The Government has also embarked on a water flagship program in the 12<sup>th</sup> FYP period to give impetus to addressing water problems including those caused by climate change.

Subsistence agriculture activities in Bhutan will be affected by the projected variability in rainfall patterns and intensity. Together with geological differences, climate variability and change will have a large influence on freshwater availability, notably whether water is guaranteed year-round or water sources dry up rapidly or gradually at the onset of the dry-season. From an agricultural perspective elevation, geology and pedology play a large role in determining whether farmers have a high risk of wet season crop failure and any opportunity of dry season cultivation. The vast majority of agriculture activities are rain-fed subsistence and cash crop production and irrigated rice crops. To sustain agriculture, new sources of water must be identified locally, tapped and invigorated, and innovation is required in water storage, including water harvesting, and usage. The feasibility of dams and reservoirs is not yet adequately assessed. However, the geological conditions in Bhutan with permeable unstable soils and rock will make it technically challenging in most instances.

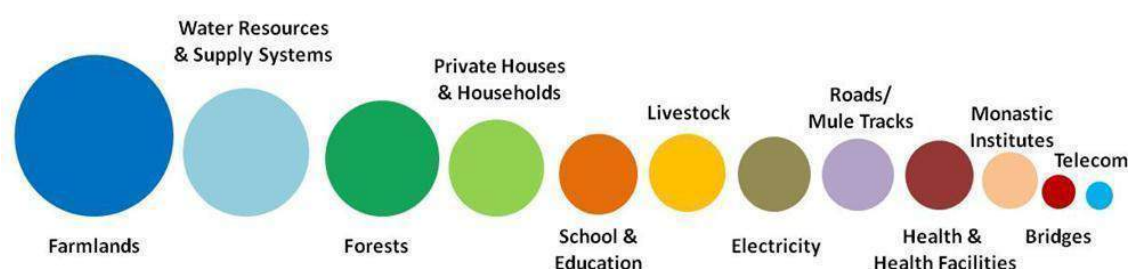
During the community consultations for past CCA projects<sup>6</sup>, communities have identified rainfall and water availability as the two principal environmental constraints on agricultural production. Many rural communities face dwindling access to water during the dry season when the largely natural springs

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<sup>6</sup> Reference is to GEF/LDCF-NAPA II and GEF/LDCF-NAPA III projects.

that they rely on reduce considerably in flow or cease altogether. There is thus a clear recognition by communities of the importance of reliable water resources and for the potential increased stress that climate change poses for these water sources, and related livelihood activities. Local differences in Bhutan manifest as different drought, landslide and erosion vulnerabilities throughout the country, with high spatial variability existing across the country.

Participatory Rural Appraisals (PRAs) of the environmental and climate change impacts on key local livelihoods resources and assets carried out in August-September 2011 in some of the poorest gewogs in the country through the Joint Support Program<sup>7</sup> also provide an insight on climate change vulnerabilities at the local level. The PRAs revealed that farmlands were the most vulnerable of all local livelihood resources/ assets, followed by water resources and supply systems, (see Figure 2). This connotes and confirms considerable climate change risks as the nation's socio-economic wellbeing is hugely dependent on agriculture and water resources.



*Source: Report of the Assessment of Environment, Climate Change and Poverty Vulnerabilities and Identification of Adaptation Responses and Capacity Development Needs of the Local Governments, December 2011, Department of Local Governance, Ministry of Home and Cultural Affairs*

**Figure 2: Proportional scale of environmental and climate vulnerabilities of local resources and assets**

## Climate Change and Gender

Climate change and its impacts are not gender neutral. Due to gender-differentiated traditional roles in society such as in agriculture, and health and nutrition of the family, women are amongst those who are likely to face the heaviest burdens from these changes and their impacts especially on agriculture and water availability. The gender assessment for the GEF/ LDCF-NAPA III project suggested that women are likely to be vulnerable in view of their roles in rural communities, which are largely confined to agricultural and domestic activities within the household while men go for off-farm non-agricultural work or conduct heavier tasks such as ploughing and firewood collection. At 54 percent, the agriculture sector accounts for the highest employment. Of this, women constitute 63.2 percent<sup>8</sup>, implying the importance of agricultural livelihoods for the development and well-being of Bhutanese women and, therefore, their vulnerability to climate change.

While a higher percentage of women are engaged in agriculture, surveys carried out for an in-depth assessment on climate change and gender<sup>9</sup> revealed that less women (69 percent) compared to men (84 percent) were aware of climate-smart and resilient agriculture initiatives. The assessment also

<sup>7</sup> Joint Support Programme, Capacity Development for Mainstreaming Environment, Climate Change and Poverty Concerns in National Policies and Programs. It was funded by the Government of Denmark, UNDP, UNEP and UNCDF.

<sup>8</sup> Bhutan Labor Force Survey Report 2018, National Statistics Bureau, Royal Government of Bhutan.

<sup>9</sup> The report of the assessment is currently a draft and its working title is "Gender and Climate Change in Bhutan: with emphasis on the NDC priority areas Agriculture, Energy and Waste." The assessment is supported by UNDP and the project partners are the National Commission for Women and Children and the National Environment Commission.

highlighted that rural men and women viewed coping measures to climate change differently, thus implying the importance of gender mainstreaming in climate change adaptation strategies.

## **Climate Change and Local Governance**

The Government is increasingly placing Local Governments at the center of the sustainable development agenda. The overall objective of the 12<sup>th</sup> FYP is to create a just, harmonious and sustainable society through enhanced decentralization. In keeping with this objective, in the 12<sup>th</sup> FYP, the capital resource allocation to the Local Governments made up 50% of the total budget outlay – a significant increase from the previous FYP where capital resource allocation made up 29% of the total budget outlay. The important role that the Local Governments have in climate change adaptation is highlighted below:

- CCA is often a highly localized matter. Different localities may experience different climate change challenges. Furthermore, climate change problems may differ between men and women, rich and poor, old and young, and between livelihoods. These local variations make climate change adaptation more suitable for Local Government actions. As formal institutions with the mandate for direct delivery of public goods and services at the grassroots level, LGs are best placed to help local communities adapt to the many consequences of climate change;
- Marginalization: mountainous communities can suffer from limited access to basic government, social and technical services including health care, education, and agricultural extension services. Hence the reinforced importance of LGs to ensure these services are available and provided;
- Given their proximity to the local communities, LGs have comparative advantages in terms of access to local knowledge, ability to mobilize local communities, and delivery of public goods and services to respond to climate change vulnerabilities;
- In the scenario of increased resource allocation to local governments, it is critical that the Local Governments have improved capacity to invest the increased resources in a sustainable manner. This among other things imply that in the current scenario of growing challenges of climate change, it is critical that local development investments sufficiently integrate climate change adaptation and gender measures.

## **Water information management**

Information concerning drinking water and irrigation infrastructural developments coupled with its management and climate resilient/ proofing facilities have been limited and mostly anecdotal in Bhutan. In addition, the integrated and cross-sectoral landscape-based approach planning has been missing in operationalizing such projects. Hence, inadequate knowledge and information on such scope has greatly affected the materialization of statistical data-based and scientific recorded information in implementing water programming in the country.

To fill the gap aforementioned, this project will support strengthening of country driven capacity building for long term knowledge management and M&E for the enhancement of institutions in terms of financial system and human resource upskilling. This will include the review of pre-existing information sources, documents, best practices and lessons learnt while mapping existing knowledge gaps from other under-implementation projects in Bhutan through the GCF, GEF and GEF LDCF (NAPA III) funding windows. Human resource development and associated institutional and budget support will be provided to upskill staff for improved long-term knowledge management.

‘Water Inventories Mapping’ will be carried as part of the project activities wherein, the comprehensive study on watershed resources, its discharge potential and beneficiary records are compiled in view to

understand the water resource landscaping in the country and to act as a point of reference to validate future study and analysis hovering the similar scope undertaken by the project under the Adaptation Fund. Information concerning the Drinking Water and Irrigation infrastructural developments coupled with its management and climate resilient/ proofing facilities have been limited and mostly anecdotal in Bhutan. In addition, the integrated and cross-sectoral landscape-based approach planning has been missing in operationalizing such projects. Hence, inadequate knowledge and information on such scope has greatly affected the materialization of statistical data-based and scientific recorded information in implementing water programming in the country.

## Project Sites

The proposed AF project will be implemented in four dzongkhags, viz. Dagana, and Paro, Tsirang and Sarpang (see Figure 3: map showing the location of the dzongkhags). It will cover 8 of the 14 gewogs in Dagana, 8 of the 10 gewogs in Paro, 3 out of the 12 in Tsirang, and 5 out of the 12 in Sarpang<sup>10</sup>. These 24 gewogs have been identified as priorities for intervention under the Government's "water flagship program." These gewogs, put together, have a total population of 53,254 and cover a total area of 1,982.63 (both about 5.6 percent of the country's total population and area).

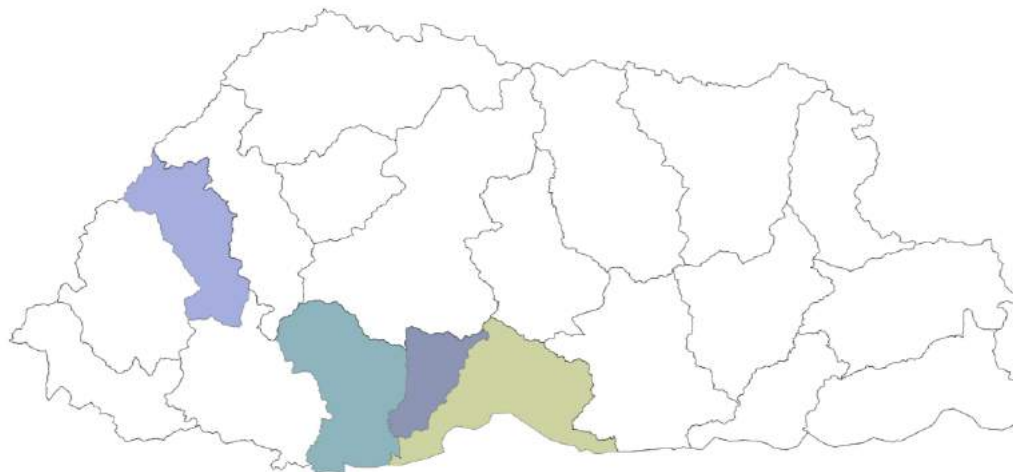


Figure 3: Map showing the location of Dagana, Paro, Tsirang and Sarpang Dzongkhags

Sl. No	Dzongkha g	Gewog	Area (km2)	Population		
				Male	Female	Total
1	Dagana	Dorona	107.7	415	337	752
2	Dagana	Drujeygang	58.30	965	977	1,942
3	Dagana	Gesarling	38.82	933	730	1,663
4	Dagana	Largyab	108.58	454	389	843
5	Dagana	Lhamoizingkha	103.95	432	364	796
6	Dagana	Tashiding	39.53	843	844	1,687
7	Dagana	Tshangkha	37.38	838	817	1,655
8	Dagana	Tshendagang	95.85	921	908	1,829

<sup>10</sup> The concept note identified 12 Gewogs in Dagana and 5 Gewogs in Paro. However, given the changing planning dynamics and urgency to implement some of proposed activities, additional two Dzongkhags of Tsirang and Sarpang and Gewogs in Paro were added. The environmental and social safeguard has been conducted for all the proposed sites.

9	Paro	Dhopshari	36.7	1,623	1,710	3,333
10	Paro	Dokar	106.2	1,116	1,211	2,327
11	Paro	Luungyi	59.7	2,453	2,274	4,727
12	Paro	Lamgong	48.8	2,972	2,874	5,846
13	Paro	Naja	151.8	1,664	1,623	3,287
14	Paro	Doteng	191.3	651	652	1,303
15	Paro	Tsento	80	3,122	2,824	5,94
16	Paro	Wangchang	34.2	758	599	1,357
17	Tsirang	Semjong	137.6	712	600	1,312
18	Tsirang	Tsirangtoe	13.773	769	682	1,451
19	Tsirang	Phuentenchhu	136.45	665	666	1,331
20	Sarpang	Shompangkha	21	757	729	1,486
21	Sarpang	Chudzom	222	1,460	1,204	2,664
22	Sarpang	Serzhong	78	1,285	1,422	2,707
23	Sarpang	Chuzergang	21	1,262	1,237	2,499
24	Sarpang	Gelephu	54	3,314	3,143	6,457
		<b>Total</b>	<b>1,982.63</b>	<b>30,384</b>	<b>28,816</b>	<b>53,254</b>

Table 1: Project locations<sup>11</sup>

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<sup>11</sup> Source: PHCB 2017 & 12<sup>th</sup> FYP statistics

## Dagana Dzongkhag

Encompassing a total area of 1,724.32 km<sup>2</sup>, Dagana lies in the southwestern part of the country. The dzongkhag has a total population of 24,965 (12,956 male; 12,009 female). Of these, 81 percent make up the rural population. The mean annual household income is BTN 156,990 (USD 2,440 approx.) (GNH Survey 2015)<sup>12</sup>. Agriculture and livestock rearing are the key sources of income. Dagana is one of the major producers of orange and cardamom in the country. The table below provides relevant vital statistics of the gewogs in Dagana:

Gewog	Population			Area (km <sup>2</sup> )	Irrigation Scheme		No. of RWSS
	Male	Female	Total		No.	Km	
Dorona	415	337	752	107.71	13	22.80	17
Drujeygang	965	977	1,942	58.30	37	31.81	22
Gesarling	933	730	1,663	38.82	5	11.00	6
Gozhi	1,256	1,251	2,507	22.14	19	38.68	20
Karmaling	785	539	1,324	92.12	4	6.10	8
Kana	1,271	1,239	2,510	191.28	40	79.40	21
Khebisa	597	618	1,215	95.92	16	60.00	32
Largyab	454	389	843	108.58	10	25.00	21
Lhamoizingkh a	432	364	796	103.95	8	20.74	9
Nichula	242	192	434	136.90	3	5.50	6
Tashiding	843	844	1,687	39.53	17	37.50	22
Tseza	554	541	1,095	594.12	16	53.92	8
Tshangkha	838	817	1,655	37.38	18	61.00	17
Tshendagang	921	908	1,829	95.85	18	44.45	48
<b>Total</b>	<b>10,506</b>	<b>9,746</b>	<b>20,252</b>	<b>1,722.60</b>	<b>224</b>	<b>497.90</b>	<b>257</b>

Table 2: Dagana statistics (source: 12<sup>th</sup> Five-Year Plan of Dagana Dzongkhag)

## Paro Dzongkhag

Paro, situated in the northwestern part of the country, has a total area of 1,293 km<sup>2</sup>. The population of the dzongkhag is 46,316 (23,941 male; 22,375 female). Rural communities constitute 74.3 percent of the population. The mean annual household income is BTN 201,823 (USD 3,140 approx) and major income sources include agriculture and livestock rearing, and in urban centers and peripheral areas they include tourism and small retail business.

The dzongkhag is divided into 10 gewogs; of which five will be covered by the project. The table below shows the five gewogs in Paro dzongkhag to be covered by the project with relevant vital statistics:

Gewog	Population			Area (km <sup>2</sup> )	Irrigation Scheme		No. of RWSS
	Male	Female	Total		No.	Km	
Dhopshari	1,623	1,710	3,333	36.7	7	18.3	-

<sup>12</sup> Cited in the 12<sup>th</sup> Five-Year Plan of Dagana Dzongkhag.



Dokar	1,116	1,211	2,327	106.2	6	3.5	23
Luungyi	2,453	2,274	4,727	59.7	4	32.5	20
Lamgong	2,972	2,874	5,846	48.8	20	28.0	15
Naja	1,664	1,623	3,287	151.8	3	11.0	32
Shaba	3,258	2,683	5,941	76.4	18	49.5	15
Doteng	651	652	1,303	191.3	5	15.2	13
Tsento	3,122	2,824	5,94	80	22	83	17
Wangchang	758	599	1,357	34.2	8	11	6
Hoongrel	266	70	366	3.6	5	6	7

*Table 3: Paro statistics (source: 12<sup>th</sup> Five-Year Plan of Paro Dzongkhag, Gross National Happiness Commission, RGoB)*

### ***Tsirang Dzongkhag***

Tsirang dzongkhag is located in the south-central part of the country with elevations ranging from 400 to 2000 m above sea level. It shares its border with Wangduephodrang dzongkhag to the north, Sarpang to the east and southeast and Dagana to the west and southwest. There are twelve Gewogs namely, Barshong, Mendrelgang, Tsholingkhar, Tsirangtoe, Dunglagang, Kikhorthang, Sergithang, Rangthangling, Gosaling, Semjong, Phuentenchu and Patsaling.

<b>Gewog</b>	<b>Population</b>			<b>Area (km<sup>2</sup>)</b>	<b>Irrigation Scheme</b>		<b>No. of RWSS</b>
	<b>Male</b>	<b>Female</b>	<b>Total</b>		<b>No.</b>	<b>Km</b>	
Tsirangtoe	769	682	1,451	13.773	34	99.5	34
Phuentenchu	665	666	1,331	136.45	23	22.5	37
Semjong	712	600	1,312	137.6			15
Barshong	423	419	842	21.2	32	24.55	34
Dunglagang	779	767	1,546	45.9	19	34.2	19
Gosaling	925	939	1,864	9.9	7	44	23
Kikhorthang	1,099	1,046	2,145	17.80	18	35.7	42
Mendrelgang	1,276	1,231	2,507	15.5	13	25.1	21
Patsaling	567	592	1,159	170.9	6	10.5	30
Rangthangling	803	782	1,585	24.4	16	27.3	47
Sergithang	731	648	1,379	14.54	24	58	33
Tsholingkhar	892	853	1,745	30.32	4	10.1	63

*Table 4: Tsirang statistics (source: 12<sup>th</sup> Five-Year Plan of Tsirang Dzongkhag, Gross National Happiness Commission, RGoB)*

### ***Sarpang Dzongkhag***

Sarpang Dzongkhag is located in the south-central part of the country with an elevation ranging from 2000 to 3600 meters above the sea level. The district with an estimated area of 1,655 sq. kms has 12 Gewogs.

<b>Gewog</b>	<b>Population</b>			<b>Area (km<sup>2</sup>)</b>	<b>Irrigation Scheme</b>		<b>No. of RWSS</b>
	<b>Male</b>	<b>Female</b>	<b>Total</b>		<b>No.</b>	<b>Km</b>	
Serzhong	1,285	1,422	2,707	78	10	41.73	12
Chuzergang	1,262	1,237	2,499	21	10	29.6	5
Shompangkha	757	729	1,486	21	9	9	21
Singye	569	511	1,080	232	7	24.1	16
Samtenling	1,456	1,345	2,801	55	13	48	11
Gelegphu	3,314	3,143	6,457	54	4	8	9
Jigme Chhoeling	1,743	1,515	3,258	501	34	78.1	43
Tareythang	225	126	351	109	8	12.5	5
Unlimg	754	832	1,586	122	18	43.1	11
Dekiling	3,290	2,690	5,980	113	10	19.5	32
Chudzom	1,460	1,204	2,664	222	8	21.5	11
Gakiling	1,105	1,020	2,125	142	29	39.41	36

*Table 5: Sarpang statistics (source: 12<sup>th</sup> Five-Year Plan of Sarpang Dzongkhag, Gross National Happiness Commission, RGoB)*

### **Project Objectives:**

The objective of the project is to build resilience to climate change and adaptive capacity of water-stressed communities in the Dzongkhags of Paro, Dagana, Tsirang and Sarpang.

The project comprises four components are as follows:

Component 1: Adaptive management of watershed for enhancing resilience of community

Component 2: Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation

Component 3: Climate-smart agriculture through sustainable land management and informed Agro-meteorological services

Component 4: Improved local Governance for effective Climate Change Adaptation (CCA) mainstreaming with focus on water management at the grassroots.

### **Project Components and Financing:**

<b>Project/Programme Components</b>	<b>Expected Concrete Outputs</b>	<b>Expected Outcomes</b>	<b>Amount (US\$)</b>
<u>Component 1:</u> Adaptive management of watersheds to enhance climate resilience of communities	<u>Output 1.1:</u> Watershed management intervention measures implemented <u>Output 1.2:</u> Payments-for-Ecosystem Services (PES) schemes scaled-up <u>Output 1.3:</u> Water sources' recharge interventions adopted <u>Output 1.4:</u> Wetland monitoring system for informed decision making established	<u>Outcome 1:</u> Increased watershed and ecosystem resilience in response to climate change and variability-induced stress	800,000
<u>Component 2:</u> Climate resilient water infrastructures for uninterrupted	<u>Output 2.1:</u> Climate- and disaster-resilient drinking water infrastructure	<u>Outcome 2:</u> Improved access to irrigation and safe drinking water	6,384,697

supply of water for drinking and irrigation	established <u>Output 2.2:</u> Climate and disaster resilient irrigation infrastructure established <u>Output 2.3:</u> Innovative technologies for tapping water adopted <u>Output 2.4:</u> User groups in the community strengthened for effective management of irrigation and drinking water		
<u>Component 3:</u> Climate-smart agriculture through sustainable land management and informed agro-meteorological services	<u>Output 3.1:</u> SLM in vulnerable and degraded areas implemented <u>Output 3.2:</u> Climate change information, products and services made available and accessible <u>Output 3.3:</u> Agricultural disaster risk reduction and management mainstreamed	<u>Outcome 3:</u> Vulnerable agriculture land brought under SLM	1,230,055
<u>Component 4:</u> Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots	<u>Output 4.1:</u> Institutional mechanisms in Local Governments strengthened for CCA and gender mainstreaming	<u>Outcome 4:</u> Improved sustainability through CCA mainstreaming and water governance at the local level	204,667
Project/Programme Execution cost			600,000
Total Project/Programme Cost			9,219,419
Project/Programme Cycle Management Fee charged by the IE			779,536
<b>Amount of Financing Requested</b>			<b>9,998,955</b>

**Projected Calendar:**

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2022
Mid-term Review (if planned)	June 2024
Project/Programme Closing	December 2026
Terminal Evaluation	February 2027

**PART II: PROJECT / PROGRAMME JUSTIFICATION****A. Description of Project Components**

The project for climate resilience building in water stressed communities in Bhutan proposes an articulated approach that will lead to healthier ecosystems and improved associated services, better management of water uses by human activities, improved information systems and decision making, and linking with the most relevant level of governance. The issues related to water availability and uses all along the watershed, the various components of sustainability (including at technical, financial and institutional level), and the participation of the beneficiaries are key aspects of the project.

**Component 1: Adaptive management of watersheds to enhance climate resilience of communities**

In general, the watersheds in Bhutan are pristine. The good ecosystem health and relatively low human pressure in the country has contributed in the overall health of the watersheds. The strong environmental policies and good practices have succeeded in maintaining, in average in all the country, a good forest cover, with available quality water resources with slow and steady economic growth. In the past decade, however, increased developmental activities across the country is posing serious threats to the fragile mountainous ecosystems. Watersheds in Bhutan show now various degrees of degradation, with some locations showing high levels of risk.

In the current state, the issues that deteriorate the watershed in Bhutan are forest degradation, drying up of water sources, grazing, soil erosion and landslides, infrastructure development and rapid urbanization. Some of the causes of these issues are forest fire, over extraction of forest resources, illegal harvesting, poor grazing management, and farm roads with poor drainage, inappropriate land use practices, infrastructure development along with climate-related hazards such as extreme rainfall events and prolonged dry season, unstable geology and steep terrain.

The degraded watersheds lack resilience and have limited ability to provide ecosystem goods and services let alone to withstand shocks associated with climate change. This in turn increases drudgery to women and children through various stresses such as shortage of water for drinking, sanitation and hygiene as well as water for agriculture. Further, the production of hydropower and nature-based tourism, which are the backbone of Bhutan's economy, is being jeopardized.

It has therefore become paramount to manage the natural resources and the livelihood of the people living within the watersheds. With more than 60% of the population still agrarian and sensitive to climate change, adaptation becomes ever more necessary, calling for more effective management and maintaining the overall health of their ecosystem services.

Integrated watershed management offers a holistic approach addressing these issues and enabling communities to increase their resilience to climate change. Adequate watershed management is a

cornerstone that allows other interventions of the project such as development of climate resilient infrastructures and water governance to be more successful.

Past experiences of integrated watershed approaches in Bhutan showed promising results. People's understanding on addressing water issues in a holistic and collaborative way have been enhanced. The need for upstream and downstream linkages has been fostered and enabled adopting mechanisms like Payment for Ecosystem Services (PES) which not only provided a viable option to finance watersheds management but also incentivized communities for their involvement in conservation activities. Currently there are four PES schemes in Bhutan focused on protection of water source areas. The recent report on "Review of PES Schemes in Bhutan", (WMD, 2019) indicated that PES schemes have not only enhanced the watershed ecosystem services but also improved the community exchequer to support the community members to use these funds in time of need and support poor and vulnerable community members during dire need of money. The AF can support in upscaling PES schemes in the project dzongkhags to enable communities to derive benefits for their conservation initiatives.

Along with watersheds, wetland management promoting wise use of wetlands and water source revival activities have also been initiated. Three wetlands have been declared as Ramsar sites and few wetlands of national importance were assessed. However, wetland management has not been carried out in the project dzongkhags. Further, 6,555 water sources which are currently tapped for drinking, irrigation and industrial use were inventoried and of these, 35 % (2,317 water sources) were found to be in the drying stage (figure 4 below) and there is need to investigate the causes of drying and intervene appropriately. Therefore, WMD is seeking AF to support upscale and strengthen these initiatives to enhance the adaptive capacities of the local communities without which wetlands and water sources in Bhutan will continue to deteriorate impacting the ecosystem and community livelihoods.

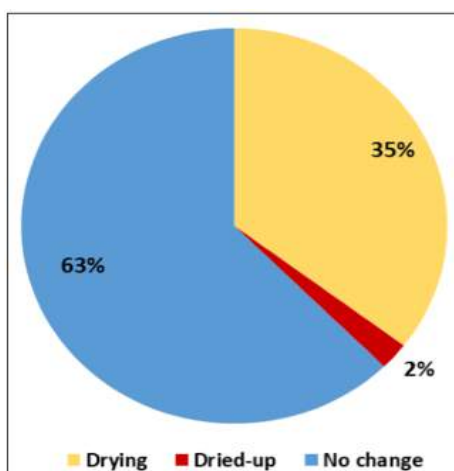


Figure 4: Status of water sources in Bhutan<sup>13</sup>

The proposed project interventions will include implementation of climate resilient activities that are expected to facilitate transformational change. This will be done by adopting an integrated approach, including the definition and implementation of robust watershed management intervention measures, the scaling-up of community-managed Payments-for-Ecosystem Services (PES) schemes, the

<sup>13</sup> Source: status of water sources in Bhutan, official data

protection of principal water sources and management of critical ecosystems such as wetlands. Further, the strategic recharge zones will be managed through the use of appropriate technologies and interventions to revive water sources and enhance ecosystem services. All those interventions shall improve the climate resilience of communities.

Under this component, the proposed project will seek to achieve the following outputs:

Output 1.1: Watershed management intervention measures implemented

Output 1.2: Payments-for-Ecosystem Services (PES) schemes scaled-up

Output 1.3: Water sources' recharge interventions adopted

Output 1.4: Wetland monitoring system for informed decision making established

### **Output 1.1: Watershed management intervention measures implemented**

In a context of highly fragile ecosystems, watershed management ensures an integrated approach leading to ensuring soil conservation, fodder/fuel wood production, vegetation control, infiltration and water recharge; but also improved access and equity for the communities.

The Water Act of Bhutan 2011 and The Water Regulation of Bhutan 2014 mandate the Ministry of Agriculture and Forests (MoAF) develop and implement watershed and wetland management plans. A "roadmap" to guide the implementation of strategies aimed at improving the management of Bhutan's watersheds was developed in 2009 and adopted by Watershed Management Division (WMD) under MoAF in 2011. It includes a strategy to focus watershed management planning initially on those watersheds requiring urgent management interventions.

Using the Guideline for Classification of Watersheds, 2016, watersheds are assessed and classified into pristine, normal, degraded or critical, with those classified as degraded or critical being scheduled for the development of management plans. WMD has undertaken the preliminary assessments of watersheds in Dagana, Sarpang, Tsirang and Paro dzongkhags and indicated communities' exposure and sensitivity to climate change while understanding on the same is limited. As such the need has been identified to carry out further assessments to comprehend the situation notably in the light of climate change and come up with appropriate interventions and measures to enhance the climate resilience of the local communities.

The prioritized project sites are Paro, Sarpang, Tsirang and Dagana dzongkhags. While Dagana has one watershed management plan developed, and watershed activities undergoing in some geogs in Sarpang and Paro, Tsirang and Paro does not have any watershed interventions carried out. The project will carry out detailed assessments of watersheds in the project dzongkhags and come up with prioritized watersheds for interventions by the midterm and implement intervention measures in at least one watershed in each dzongkhag by the end of the project. An exhaustive list of appropriate interventions will be identified, consulted and implemented. At least one training workshop per dzongkhag will be performed. Also, at least two study visits per gewog will be conducted, during the whole project duration.

To achieve this output, the following activities will be undertaken:

Activity 1.1.1: Conduct community consultations and sensitizations (24 Gewogs to be consulted)

Activity 1.1.2: Training workshops (Four in total - one per project district) and study visits (2\*4=8)

Activity 1.1.3: Conduct detailed watershed assessments in the project dzongkhags (minimum of four – at least one for each dzongkhag)

Activity 1.1.4: Development of watershed management intervention measures for the prioritized areas (at least one plan per dzongkhag- minimum of four)

Activity 1.1.5: Implementation of identified intervention measures

## **Output 1.2: Payments-for-Ecosystem Services (PES) schemes scaled-up**

Payment for Ecosystem Services recognize the efforts done by upstream people that lead to the betterment of the lives of the downstream people in watersheds. Not only does a PES establish forms of collaborative management of natural resources and of the geographical space within a watershed, it also gives strong incentives towards the implementation of sustainable practices.

In Bhutan, PES initiative was started a decade ago in 2009 by WMD under Department of Forest and Park Services (DoFPS), and currently schemes are established in four dzongkhags: Paro, Tsirang, Chukha and Mongar. The main principle behind the PES scheme is to bring the beneficiaries of ecosystem services into direct contractual agreement with local communities protecting and conserving watersheds by adopting practices that ensure continuous supply of the services which in the current context is drinking water.

The recent report on PES schemes in Bhutan highlighted the benefits of PES both for securing watershed services as well enhancing the communities' bank account. However, the report also indicated the need to provide further advocacy and sensitization to strengthen PES mechanisms in the country.

This project provides an opportunity for improving stakeholders' awareness and knowledge (at all levels, including best resource management practices, financial management, decision making, ...) in PES benefits supporting scaling up PES schemes in the potential sites within the project dzongkhags and strengthen communities' stewardship towards watershed conservation. This will entail transformational change in proper management of natural resources by empowering communities to take charge. Further, experiences in the current sites as listed above will ensure not only stewardship but also replenishment of adequate water resources to the end-users through payment system.

Paro and Tsirang Dzongkhags currently have one PES scheme each, while there is none in Dagana and Sarpang Dzongkhags. Through this project, two more PES schemes will be explored in project sites. Actual development of the two additional PES schemes will depend on the feasibility and willingness of the stakeholders. Experience shows that providing awareness and education is the major component in the success of a PES scheme development. Therefore, awareness on PES will be conducted in other areas to educate communities on PES advantages and PES related management.

Under this output, the following activities are foreseen for project implementation

Activity 1.2.1: Conduct community consultations and sensitizations (one per gewog)

Activity 1.2.2: Hands-on training workshops in the management of PES schemes (4 trainings in total)

Activity 1.2.3: Conduct detailed resource assessment and inventory (one per dzongkhag)

Activity 1.2.4: PES scheme development and implementation based on the feasibility

## **Output 1.3: Water sources' recharge interventions adopted**

According to the State of the Environment Report of Bhutan (2016), water source drying is a country-wide phenomenon. Similarly, the issues were also recorded by WMD while carrying out watershed



assessments and development of management plans. Subsequently, WMD carried out assessment of drying springs and lakes that are used as drinking water sources (Refer figures 5 and 6 below) under SPCR project. The study found out that the drying of water sources is widespread and has detrimentally affected both rural and urban population, limiting water supply for domestic consumption and irrigation.

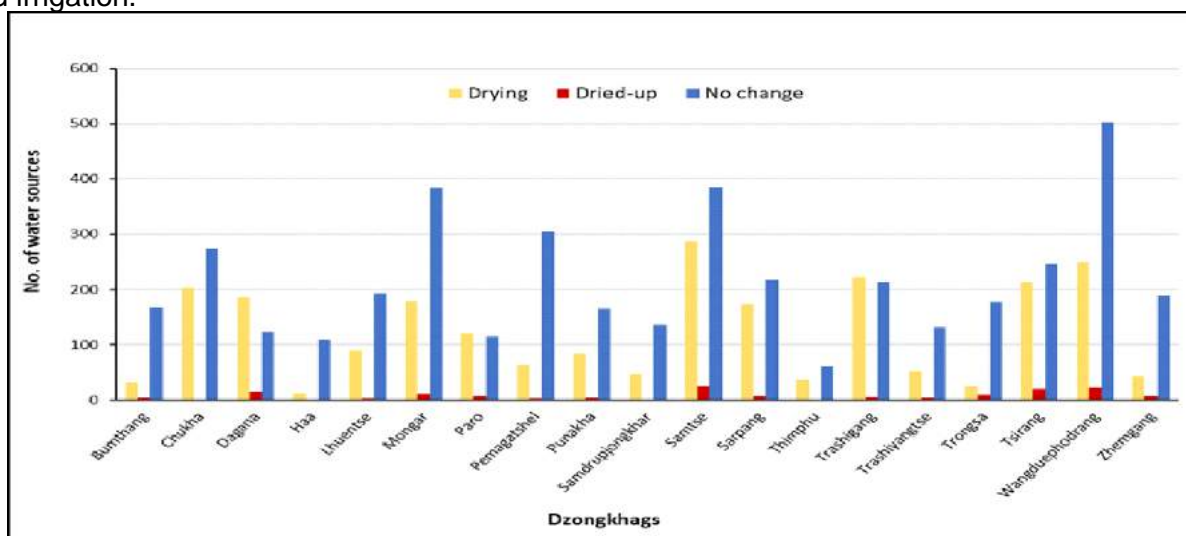


Figure 5: Status of Water Sources by Dzongkhags

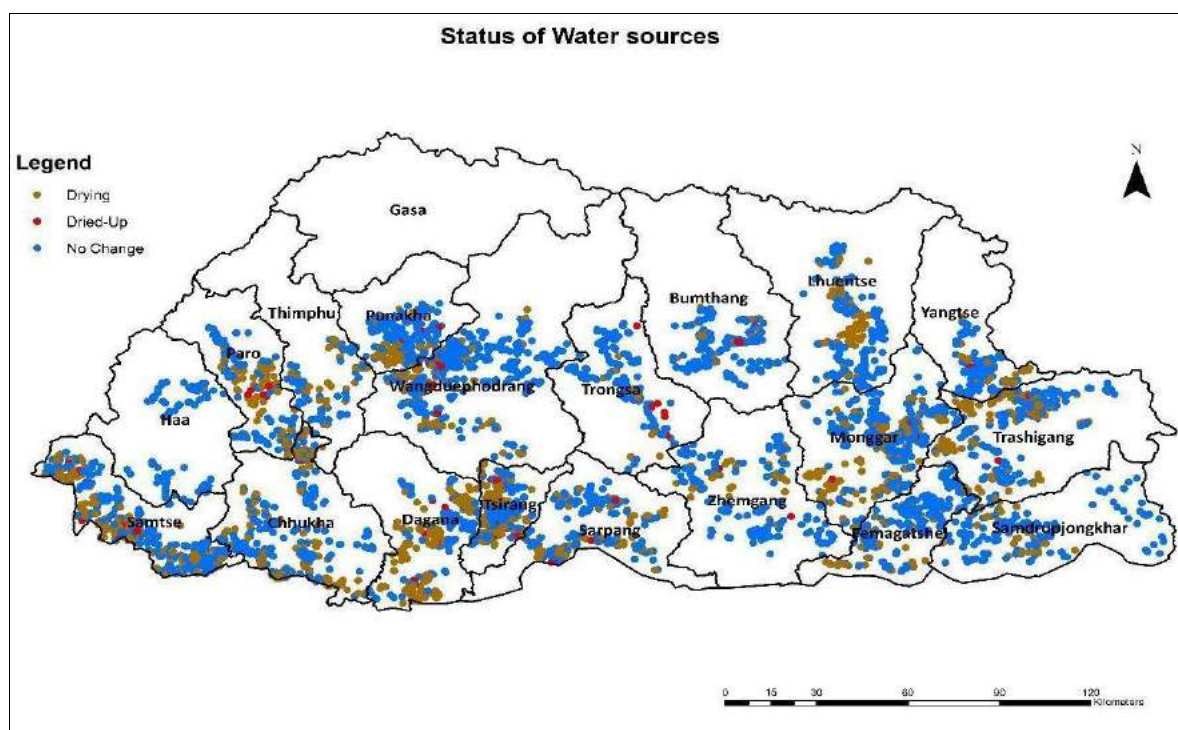


Figure 6: Map showing the location of various water sources and their status

However, at the present, there is no integrated and cross-sectoral approach to combat drying water sources in the country. It is often done in unsystematic ways. For instance, some has recommended fencing the water sources, others recommended building water storage tanks and tapping from alternative sources. Thus, the interventions create further complex unintended consequences, as there is lack of interdisciplinary approach to address the core problem.

In order to understand the issue further, WMD has initiated water source studies and revival activities in Lholing under Paro Dzongkhag using the spring-shed methodology through understanding of hydrogeology and climate impacts, and prescribing activities such as digging trenches, identifying protection areas, plantations, soil and land management activities and other bio-engineering activities.

The proposed project will seek to strengthen the existing revival site in Paro and try to replicate the same in at least three more areas in other project dzongkhags through the AF support which otherwise would remain at the pilot scale.

The proposed project will implement the following activities to achieve this output:

- Activity 1.3.1: Conduct community consultations and sensitizations (one per gewog)
- Activity 1.3.2: Training workshops (at least one training workshop per dzongkhag)
- Activity 1.3.3: Development of planning of intervention measures for the prioritized area (at least one per dzongkhag)
- Activity 1.3.4: Implementations of intervention action plan activities
- Activity 1.3.5: Monitoring and maintenance of conservation/restoration activities

#### **Output 1.4: Wetland monitoring system for informed decision making established**

The general type of wetlands in Bhutan includes lakes, rivers, springs, ponds, marshes, peat bogs and other predominantly waterlogged areas. Functional wetlands are critical segments of the watershed, as they support a high level of biological productivity and diversity. Wetlands are recognized to provide fundamental ecosystem services, such as water regulation, filtering and purification, as well as numerous scientific, cultural and recreational values. Thus, wetland ecosystems are important for the maintenance of the broader ecosystem health.

In the past, strong cultural and traditional ethos among the Bhutanese population and the lack of modern development technology (heavy dredging equipment and other land conversion technologies) had protected the wetlands. However, in the recent past, the disappearance of significant areas of wetlands was recorded especially in and around urban centers. The main drivers of change were fragmentation of large natural wetlands and impacts of climate change. Concurrently, the number of complaints on worsening quality and decrease in quantity of drinking water has seen significant rise.

WMD proposes to carry out inventory of wetlands in the selected four dzongkhags. The wetlands inventory primarily will provide the tools in implementing the Forest and Nature Conservation Rules and Regulations (FNCRR) 2017, where there are specific clearance mechanisms established to stop the conversion of significant wetlands in the country to other land use. The wetland inventory is also expected to provide the number and extent of wetlands requiring protection within the project site. The use of the inventory as a guide in forestry clearance processes will strengthen protection and management of critical wetland ecosystems and help in enhancing the resilience of communities by protecting their water sources.

Wetland mapping activities will be based on remote sensing technology, both validating existing wetland records and identify additional wetlands if needed. Data be will collected in all project sites.

The AF support would assist in establishing a reliable wetland monitoring system that would facilitate in developing plans and programs to address the vulnerability issues and maintain wetlands ecosystem functions.

- Activity 1.4.1: Training workshops for capacity building of field offices (at least one per dzongkhag)  
 Activity 1.4.2: Conduct mapping of wetlands for the project dzongkhags using remote sensing  
 Activity 1.4.3: Field data collection and mapping (all project gewogs)  
 Activity 1.4.4: Data compilation and analysis, feeding decision making mechanisms

## **Component 2: Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation**

### ***Drinking water***

The very first element coming into picture is water which is affected by climate change. Daily rising inconsistency in temperature and precipitation has contributed to steep rise and drop in water availability in rivers and springs. It is crucial to adapt to these changes wherever possible to ensure continuous availability and/or accessibility of this vital resource.

Bhutan has high per capita availability of water when assessed at the level of basins with the total outflow of the rivers estimated at 109,000 m<sup>3</sup>/capita/year (National Integrated Water Resources Management Plan, 2016, NECS). However, issues in water accessibility continue to persist due to insufficient source management, inadequate infrastructure development and issues in management and governance. Issues in water quality are also becoming pertinent. The issues in water quantity and quality are further exacerbated by increasing population and urbanization and climate change. The rugged terrain and altitudinal variations also create imbalance in water supply with some areas having abundant water while adjacent one experience shortages. The abundant water is largely available in the form of major rivers and tributaries flowing in the low-lying river valleys and deep gorges, whereas most of the communities are located along slopes and depend on smaller streams, springs and lakes for drinking some of which are already drying. This issue of accessibility is clearly visible in some areas where rivers are freely flowing in the bottom of the valley, while houses on the hill sides remain facing shortages. Paro, Dagana, Tsirang and Sarpang are four such dzongkhags in Bhutan being considered here for this adaptation proposal wherein, an integrated approach is adopted to address water related issues at the source, infrastructure, quality and management levels with consideration for economic, social and ecological components along with risk factors (such as climate change and increasing population).

<b>Dzongkhag<sup>14</sup></b>	<b>Total Households (HHs)</b>	<b>Total HHs with continuous flow (24*7) of water</b>	<b>Total HHs without continuous flow (24*7) of water</b>	<b>Coverage in terms of 24*7 water supply (%)</b>
Dagana	5,974	4,437	1,537	74.3
Paro	8,969	5,160	3,809	57.5
Tsirang	5,074	3,812	1,262	75.1
Sarpang	10,536	5,956	4,580	56.5
<b>Total</b>	<b>30,553</b>	<b>19,365</b>	<b>11,188</b>	<b>63.4</b>

*Table 6: Current Water Supply Scenario in targeted rural areas*

In the context of Bhutan, access to 24x7 water supply is considered as having adequate water for 24 hours from a tap, which may also be by means of storage facilities.

<sup>14</sup> The data is extrapolated from BLSS 2017 survey

The common challenges faced by the dzongkhag municipalities are lack of safe drinking water supply due to non-existence or poor functionality of water treatment plants as well as inadequate water supply systems along with instances of drying up of water sources. Some towns and extended areas under municipalities are still catered by RWS and are thus, supplied with untreated and unmetered water.

In the rural areas, transferring of scheme ownership to the beneficiaries and maintenance has been a major challenge after the construction of Rural Water Supply Scheme (RWSS). Differing interpretations of policies and strategies has led to conflicting, differing and rapidly changing priorities and practices in the sectors. Many beneficiaries still see the ownership and responsibility for major maintenance and rehabilitation of rural water supplies as being that of the dzongkhag or RGoB. Many implementation procedures have actually contributed to a lack of beneficiary commitment to the self-management and maintenance of their own schemes.

Other mitigations include strengthening the existing water transmission/ distribution lines to be more climate-resilient and durable. Also, new water supply infrastructures considered for this project will be built with adequately resilient materials to ensure long-time benefits. Furthermore, infrastructures like the Water Treatment Plant (WTP) are also being considered (wherever necessary) to enhance the drinking quality standard.

### ***Irrigation Water***

Climate change induced by global warming poses significant risks to irrigated agriculture in general and water management in particular. Water availability and management is becoming challenging, with remote areas experiencing scarcity in dry areas and monsoon seasons experiencing high rainfall, flash floods and landslides have damaged existing irrigation schemes. Climate change is already impacting spring systems across the HKH region and Bhutan is not an exception. In the case of an irrigated system, rice cultivation is mostly dependent on monsoon charged spring waters and streams fed by glacier melts. Slight delays or changes in the pattern of rainfall directly impacts both availability and amount of irrigation water. Given the seasonality of streams and spring waters and extreme events, a major focus in building climate resilient irrigation structures and improvements in water management practices remains crucial. These interventions would help in improving the sustainability of farm productivity.

Most of the irrigation schemes in Bhutan were constructed as earthen canals with low efficiency and little resilience to extreme events – leading to blockages, water loss through seepage, water conveyance loss and frequent damage by landslides. The current infrastructure is exposed to deterioration by even slight increases in river floods and landslides caused by climatic variability, mainly rainfall patterns and temperature. These systems are thus highly susceptible to climate change effects.

With less than 18% of cultivated agricultural land irrigated, agriculture is predominantly rain-fed and dependent on the changing monsoonal rain patterns. Water shortages have been more pronounced during the main cropping season, which coincides with the pre-monsoon season. During dry periods, drought has impacted cropland, as well as the small streams on which small-scale irrigation depends, resulting in inadequate on-farm water supply, conflicts over water sharing, low labor productivity (e.g. due to time spent guarding against water theft) and low crop yields. In times of excess rainfall, flash floods and landslides block or damage irrigation schemes, disrupting flow of water to farmers through seepage-induced water loss and water conveyance losses. As a result, climate change not only negatively impacts rain-fed agriculture, but also irrigated agriculture production.

Despite the considerable investments made in water resource management, there has been limited explicit consideration of future climate change impacts in these investments. Climate change has also served to undermine several of these investments and jeopardize many of the gains made through past interventions. For instance, the government's past investment in irrigation systems has not been climate resilient, causing irrigation systems susceptible to flood damage from heavy monsoon rain. Therefore, the project seeks to install climate proof infrastructure for drinking water and irrigation water supplies, thus enhancing and ensuring water security at every household in the two project sites. It is also expected to enhance food security through improvement in accessibility to water and channeling time saved into other income generating activities.

The project proposes to install or replicate successful irrigation systems such as hydro-pressurized pipe or High-Density Polyethylene (HDPE) pipe in Bhutan replacing the conventional conveyance system. Conventional irrigation systems often lose huge amounts of water to evapotranspiration and seepage and are vulnerable to extreme climate events like heavy rainfall. In addition, annual maintenance of long-distance irrigation canals requires huge labor and expenses, which could otherwise be spent on income earning opportunities for a household. In order to develop climate resilient irrigation systems, the climate change components will be mainstreamed in the irrigation planning process.

Replicating successful irrigation systems such as hydro-pressurized pipe or HDPE pipe are also expected to minimize negative environmental effects such as landslides often due to poor maintenance of the open irrigation canal. Further, the proposed technology has improved water delivery to the end users through reduction of loss of water to evapotranspiration and seepage. The large sized HDPE pipes were used to deliver the water to end users and in most of the cases the pipes are buried under the soil. Thus, vegetation cover will regain on those excavated sites and there is minimal effect on the arable land, as farmers can still cultivate crops with pipes running below.

The irrigation component under the project will focus on only two Dzongkhags of Dagana and Paro. These two Dzongkhags were specifically selected given their vulnerability to climate change and priority for the government. As per the National Irrigation Master Plan (NIMP), 40 and 15 irrigation schemes have been prioritized for irrigation modernization in Dagana and Paro respectively. Most of those irrigation schemes are partially damaged since those schemes were either constructed in early 90s and have received very little government assistance ever since then.

However, for the support under the adaptation fund, these irrigation schemes were further prioritized in consultation with the respective Dzongkhags considering the Multi-Criteria Analysis.

<b>Sl. No.</b>	<b>Dzongkhag</b>	<b>No. of Irrigation schemes</b>	<b>Present gross area (ac)</b>	<b>Likely extension area (ac)</b>
1	Dagana	40	4227	2253
2	Paro	15	2299	730

*Table 7: The prioritized irrigation system for modernization as per NIMP.  
(Modernization involves re-engineering of existing irrigation systems and their structures)*

The proposed project will be built upon the experience and benefits of climate resilient technologies and practices demonstrated and key lessons learned from past irrigation support projects.

## **Output 2.1: Climate- and disaster-resilient drinking water infrastructure established**

In the municipalities, it is of utmost importance that the water infrastructures be built with upgraded technology in order to make them potentially resilient to climate change. Today, resilience of many infrastructures has reduced drastically with time factored by excessive leakages and intermittent supply. Similarly, in rural Bhutan, it is very common to see drinking-water supplies being directly managed by households in an effort to have alternate supply of reliable water which is actually triggered by the failure of RWS schemes in supplying reliable water. In many cases, this is as a result of inadequate operation and maintenance of the RWS schemes due to lack of funds. These already substandard situations are at a high risk of being adversely affected by climate change owing to the increase in severity of challenges to the scheme managements.

While addressing the issues mentioned in the previous section, the project will construct new rural water supply schemes, rehabilitate/ renovate the existing schemes, and also tap new sources for a sustainable water solution. The infrastructure should look into the future needs of population growth, increasing demands and also the need to have structures designed adequately for lean flows in the winter and increased flood risks in the monsoons, to make them climate resilient. The project includes activities aimed towards reliable supply of drinking water such as source protection, extension of pipeline to a reliable source, and construction of water reservoirs to ensure continuous supply of water. As the supply of water becomes reliable, the need for temporary extractions of surface water from multiple places gets reduced and hence the vegetation of the districts is less disturbed.

One of the objectives of this project is to also ensure that the quality of the drinking water meets the standards set by the Bhutan Drinking Water Quality Standards (BDWQS) 2016 and thus development of Water Safety Plans is proposed. Water Safety Plan (WSP) is a water supply system risk management plan that addresses all steps in the water supply chain from catchment to consumer, ensuring the safety of drinking water. Although WSPs have been implemented in the past, many are not fully functional and thus, require reinforcement. Furthermore, in order to ensure sustained supply of good drinking water, periodic water quality testing needs to be conducted which entails procurement of testing kits and reagents including training.

The activities foreseen for project implementation to achieve the output are as follows:

### *Activity 2.1.1: Construction and Rehabilitation of at least 6 Drinking Water Supply Schemes:*

Major portions of the infrastructures include the construction of rural water supply schemes which constitutes of constructing climate resilient; 1) intake structures and collection tank, 2) water transmission mains, 3) water distribution network, and 4) water reservoir. The activities not just include construction of new structures, it also includes rehabilitation/ augmentation of the existing structures which is equally essential to ensure resilience against climate change and thereby ensuring 24x7 water supply.

Water infrastructures in urban areas also include similar types as mentioned for rural areas but in a bigger way owing to the sheer increase in the population as compared to the rural areas. In addition to the water intake, transmission, and distribution, there is a need for water treatment plants especially for the urban settlement as the quantity of water stored is relatively huge and hence there is greater chance of contamination. After the completion of the project it is projected to benefit 5,297 households with a population over 30,215.

To ensure sustainability of the schemes, formation of water user associations is proposed as part of the project which will be institutionalized and the operation and maintenance aspects of the scheme after project finalization will be integrated into local government plans.

### *Activity 2.1.2: Development of Water Inventory*

At the end of the project, it is very essential to have a reliable inventory of the water source and water supply assets which will provide guiding/ monitoring data for future sustenance. At present, the quality of data in terms of water source and distribution is very weak which provides very minimal information regarding the water situation of the four dzongkhags. This project will ensure development of a reliable database of the completed water scheme, starting from the source till the end user which can even be replicated in other remaining dzongkhags of the country. The existing information system “WaSIS (Water and Sanitation Information Systems)” managed by the Water and Sanitation Division, MoWHS shall be reviewed and strengthened. The data input shall be provided by the respective Local Governments and shall be updated periodically. The information from WaSIS shall be shared with the key stakeholders as and when required. After the project finalization, it will be integrated into the national and local government plans and program and will be used for plans.

### *Activity 2.1.3: Capacity building of Engineers in Climate Resilient water supply infrastructures*

First and foremost, it is necessary to establish the knowledgeable working group in order to execute any developmental activity. The concept of climate change is fairly new when it comes to water supply infrastructures in Bhutan. Most of the existing water supply works (especially rural schemes) executed are of conventional type. Although, it might be incorrect to say that these existing structures are not climate resilient, it is for sure guaranteed that these could be improved and made much more adaptive to climate change. Therefore, it is of utmost importance that the engineers executing these projects be educated in the concept of climate resilient structures. Through this project, the capacity of the engineers will be enhanced particularly in the concept of adaptation to climate change when it comes to water infrastructures including the complete conveyance (water source, transmission, treatment and distribution). It is foreseen that a minimum of 2 sessions for at least 20 Dzongkhag engineers and technicians and central agencies engineers will be organized.

## **Output 2.2: Climate and disaster resilient irrigation infrastructure established**

The proposed activities under this output include:

### *Activity 2.2.1: Construction of at least 2 pressurized/closed irrigation systems (gravity)*

The adaptation fund will support construction of 2 new pipe irrigation schemes to achieve greater climate resiliency and support farmers experiencing critical water scarcity, covering a total area of 216 acres. Given that the reliance on rainfed practices is of limited use in the face of increasing rainfall variations, the schemes will be aligned towards reliable water sources. The project will also focus on integration of both drinking and irrigation water wherever possible so that participation and ownership by beneficiaries are focused through formation of Water Users Associations (WUAs) with appropriate technological and institutional inputs. By combining both drinking and irrigation water, there will be no conflict over water tapping rights and will reduce the drudgery, maintenance cost as well as reduce the investment cost.

### *Activity 2.2.2: Re-engineering/rehabilitation or improvement of four existing irrigation systems*

To enhance and ensure water security at every household, the adaptation funds will climate proof or strengthen the resilience of four existing open earthen canal irrigation schemes against extreme events, covering 629 acres. With the planned improvement of the existing irrigation systems, much of

the infrastructures that are of temporary nature will be replaced by more robust, flexible and climate resilient structures. Environmental impacts caused by overflow from open canal systems will be avoided and leakages from pipes will be reduced with the improvement of the systems through appropriate technology.

#### *Activity 2.2.3: Scale up micro-irrigation system (drip & sprinkler)*

The project will also focus on dry land irrigation with appropriate technological and institutional inputs. Sprinklers and drip irrigation allow for efficient use of water and represents an adaptation strategy against scarcity of water. Small perennial streams will be tapped and water will be conveyed under gravity through pipes to provide irrigation through more efficient systems. Accordingly, adaptation resources will also be used to upscale high efficiency irrigation or water saving technologies such as sprinkler irrigation and drip irrigation for high value crops such as vegetables and horticulture crops. This activity will support installation of two drip irrigation and four sprinkler irrigation systems covering a total area of 100 acres.

#### *Activity 2.2.4: Tail water management*

The irrigation tail water management was not given much importance in Bhutan. However, due to increasing extreme events, the management of tail water is becoming more important in order to prevent negative environmental impacts it causes downstream of the command area. Accordingly, the adaptation fund will fund tail water management in two schemes on pilot basis to properly channel the irrigation tail water into the natural gullies.

### **Output 2.3: Innovative technologies for tapping water adopted**

Initially, Dagana Dzongkhag had proposed for rain water harvesting in a few villages/blocks but later when the assessment was carried out the rain water harvesting approach was not found feasible and the activity was revised to “extension of source and rehabilitation of the existing water supply schemes.

Similarly, under Paro Dzongkhag, few gewogs had also been proposed for ground water extraction but when the resistivity test (Ground water assessment) was done by the Department of Geology and Mines (DGM), they recommended further study. Therefore, due to the limitation of their findings, the ground water exploration activity was dropped and later, the Dzongkhag proposed gravity water supply which the activity has been proposed under BTFEC funding.

The proposed activities under Irrigation for this output include:

#### *Activity 2.3.1: Promote and scale up solar/electric/manual water pump for irrigation*

Owing to mountainous terrain almost all the existing irrigation systems in the country are operated through gravity flow with zero use of external energy/power. However, there are many areas located close to major rivers that face irrigation water shortage and arable lands are left fallow. These areas have the potential to pump water from the nearby rivers for irrigation and bring the fallow lands into cultivation to increase crop production. With increased economic development, the demand for water has drastically increased over the past few decades putting pressure on the existing water sources. To meet the new demand for alternative water resources (pumping from rivers, groundwater, etc.) need to be identified and tapped in.



The project will therefore promote and upscale different types of water lifting devices (Solar/electric/Hydraulic ram, etc.) essentially for the diversification of water sources for irrigation. The objective of diversification of water sources is to augment the amount of water supply for irrigation by tapping more reliable sources than the existing seasonal sources. This activity will promote and install three solar/electric water pumps for irrigation to diversify the water sources in Paro.

*Activity 2.3.2: Build water harvesting structures or small-scale reservoirs to tap water for irrigation.*

Bhutan has a unimodal annual rainfall pattern, which is heavily influenced by the South-West Monsoon with the rain falling mainly during the June-September period. For the remaining months of the year there is little or no natural precipitation to grow a second crop. One of the options to irrigate and grow crops during winter or drought period could be to collect and store surface runoff during the Monsoon period and/or store water from the nearby springs and brooks. This will entail construction of farm ponds at the individual household level and relatively larger ones (reservoirs) in feasible areas for local community level.

Adaptation resources will therefore build small earthen check dams and ponds as small-scale reservoirs for irrigation water supply during dry periods. Water storage in Bhutan is clearly a necessity, to meet growing water needs of urban areas, as well as to supply irrigation water for agriculture (which is mostly rain-fed at present). These needs are particularly evident in those areas where water is plenty during monsoon but become completely dry during winter although the land is fertile. Low dry season flows in rivers already pose difficulties for different users. This is expected to worsen with climate change. Water storage will help sustain the use of limited water during the dry season, thereby increasing the area irrigated during the dry season. The strategy is to build water storage to increase year-round reliability of water. Therefore, this activity will support construction of eight small-scale earthen check dams and farm ponds in Dagana.

#### **Output 2.4: User groups in the community strengthened for effective management of irrigation and drinking water**

As per the Water Act of Bhutan 2011, any group of beneficiaries using a particular water source for their water supply needs may form a Water Users' Association to maintain the water source and to manage water supply services.

Some sectors (farm roads and irrigation under MoAF) have already developed policy guidelines for the formation of community groups and their involvement in carrying out minor maintenance works. Besides formulation of policy guidelines and establishment of clear structural-functional linkages, need based capacity building of all relevant stakeholders is equally important for effective implementation of these guidelines and operationalization of the linkages. To this end, through this project, user groups in the community to promote local ownership will be formed and strengthened. Building the capacity of the Community Groups through sensitization and training is another area that this project would like to address.

Rural to urban migration of the population is yet another persistent problem despite so many development activities taking place at the grassroots level. One of the main reasons often cited is non-availability of the jobs in the remote areas coupled with poor basic amenities. The promotion of Community Groups along with strengthening of their capacities through this project is expected to attract educated youths and school dropouts to take up the roles of leading and managing these Community Groups.

Activities proposed under this output will cover six WUAs for drinking schemes for drinking and 23 WUAs for irrigation schemes and include:

*Activity 2.4.1: Form and **strengthen formal (registered) water** user groups in the community to promote local ownership and sustainability of rural drinking water*

Under the Water Act of 2011, WUAs are mandated as the managers of drinking water schemes. In line with this RGoB policy, water users will have to take charge of the operation and maintenance of their scheme including institutional members. The main objective of formation of the WUAs are:

1. Operate and maintain drinking water schemes and distribute it uniformly among the user groups **including poor and vulnerable groups and households within the community**.
2. Rehabilitate and improve the drinking water scheme
3. Train WUA members **(30 percent women)** on the operation and maintenance of the schemes.

This activity will be able to provide training and support to **twenty five** WUAs which in return will help them to operate, maintain and sustain their schemes.

*Activity 2.4.2: Form and strengthen **formal (registered) water** user groups in the community to promote local ownership and sustainability of irrigation schemes*

Under the Water Act of 2011, WUAs are mandated as the managers of irrigation schemes. In line with this RGoB policy, water users will have to take charge of the operation and maintenance of their scheme. The National Irrigation Policy states that each Water Users Association should have a constitution with bylaws. The constitution describes the organization of water users and bylaws specify the rules for proper use and maintenance of the irrigation system. The Water Users Association (WUA) Constitution and Bylaws aim to ensure that a particular irrigation system is operated, used and maintained well and will continue to give good benefits to all water users over a long period. WUA constitution and bylaws particularly emphasize mainly on the following:

1. Proper operation of the irrigation system
2. Fair distribution of water
3. Timely and proper maintenance of the irrigation system

The main purpose of having the WUA Constitution and Bylaws is to have rules and regulations to deal with any dispute between water users. WUA Constitution and Bylaws will have a record of all the existing rules for the organization and management of the irrigation system and where necessary new rules are developed and clearly written down after thorough discussion and accepted by all the WUA members.

The training and formation of WUA focuses on framing the practical, workable and **inclusive** constitution and bylaws.. The trainers assist the WUAs to establish their own constitution and bylaws which aim at improving the organization and management of their irrigation system. Almost all the community managed irrigation systems (CMIS) will have their informal and traditional groups with existing rules for organization, operation and maintenance. Each and every irrigation system receiving the support of the government will have WUA being formed through training and an improved version of the existing rules accepted by all the WUA members and signed by WUA committee members **(30 percent of whom will be women)** for reference. If rules are clearly written down, fully understood, accepted and followed by all water users, the irrigation system will be better used and will last longer thus benefiting all water users.

Moreover, the beneficiaries of each irrigation scheme receiving the Government support will receive Scheme Management Training toward the end of the construction period mainly to prepare the water users for operation and maintenance. It is essential that water users are fully aware of the operation

and maintenance requirements of all structures. Thus, water users practice the specific operation and maintenance (O&M) requirement for provided structures specially which are new to the users and thoroughly briefed on the possible areas requiring special attention and advise them to attend to those areas periodically. Along with the training on formation of WUA and scheme management training, the WUA members are acquainted with the knowledge of banking and book keeping and the importance of monitoring and reporting about the conditions of the renovated/constructed irrigation system.

It is believed that women play an important role in both irrigated and non-irrigated agriculture and a larger number of women than men are involved in un-assured irrigation water for agricultural food production in the developing countries. With the involvement of women in the meetings and training related to irrigation and agriculture; it means a promotion of knowledge in water administration which is inevitable. Moreover, the committee members in WUA are being dominated by the female population since more females participate in the meetings. In the process, more females are educated and well versed with the rules and regulations pertaining to operation and maintenance of the provided irrigation systems thereby empowering the women in the decision-making process.

This activity will therefore provide targeted training and support required for 25 WUAs to undertake these duties. This will entail training in water management and maintenance of the systems, and will also address the institutional issues of registration, elections, managing contracts, banking, and auditing and **use of tools and technologies and efficient use of water.**

### **Component 3: Climate-smart agriculture through sustainable land management and informed Agro-meteorological services**

In Bhutan, only 7.8% of the total land area is arable and 2.93% is cultivated<sup>15</sup>. About 31% of agriculture land is situated on slopes more than 50%<sup>16</sup>. Farming is often carried out without any sustainable agriculture practices leading to annual soil loss of 3-21 t per hectare<sup>17</sup>. The loss of topsoil poses a serious threat to food security as it significantly reduces the inherent soil fertility, soil organic matter and water retention capacity resulting in poor land productivity and crop yield. Furthermore, as agriculture is predominantly rain-fed and dependent on monsoon rainfall patterns, agriculture in Bhutan is highly sensitive and vulnerable to the impacts of climate change and climate variability<sup>18</sup>. The Intergovernmental Panel on Climate Change<sup>19</sup>, also warns that mountainous regions such as Bhutan will experience a crop yield decrease due to increase in water stress (either too much or too little) and land degradation.

The impacts of climate change on land and crop productivity are projected to continue in future with changing temperature and precipitation patterns (refer Project Background and Context, pages 4-5). In order to address the climate change impacts, the NAPA (2011) and the Renewable Natural Resources (RNR) Sector Adaptation Plan of Action (SAPA) 2016 have undertaken sector vulnerability assessments and identified the following key adaptation measures, among others:

- (i) Scale up of Sustainable Land Management (SLM) Technologies to promote soil and water conservation;
- (ii) Improve weather and seasonal forecasting for farmers (Agro-meteorology)

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<sup>15</sup> *Land Cover Mapping Project (LCMP), 2011, National Soil Services Centre, DoA, MoAF*

<sup>16</sup> *National Action Program to Combat Land Degradation in Bhutan (NAP), 2014, National Soil Services Centre, DoA, MoAF*

<sup>17</sup> *Soil Erosion Report, 2010, National Soil Services Centre, DoA, MoAF*

<sup>18</sup> *National Adaptation Plan of Action (NAPA), 2011, National Environment Commission (NEC), RGoB*

<sup>19</sup> *Intergovernmental Panel on Climate Change (IPCC), 2007*

In line with the above, promotion of SLM technology was taken up as one of the options that fit well in Bhutanese farming environment and thus proven very successful in reducing land degradation caused by anthropogenic activities. In fact, the implementation of SLM interventions, especially the contour grass hedgerows on sloppy agriculture land have found to reduce soil erosion by 50 percent<sup>20</sup> as compared to traditional farming practices. Furthermore, Bhutan being the Party to the United Nations Convention to Combat Desertification (UNCCD) has committed to work towards Land Degradation Neutrality (LDN) by 2030 by setting LDN voluntary target of restoring and improving 61.17 sq. km (6,117 Ha) of vulnerable and degraded areas of which about 35 sq. km (3,500 Ha) is to be brought under SLM interventions.

The National Soil Services Centre (NSSC), as the focal agency for SLM under the Department of Agriculture, has implemented a number of SLM projects through funding support from various donors (GEF through the World Bank, UNDP-SGP, BTFEC, and RGoB). These projects have successfully piloted and scaled up climate smart agriculture with special focus on SLM measures. The benefits and the importance of SLM technologies have been well demonstrated and key lessons learned and best practices are well documented and widely shared. These proven SLM technologies and best practices are now being scaled up in other areas through funding support from the on-going projects-GEF-LDCF, GCF, IFAD funded CARLEP (Commercial Agriculture & Resilient Livelihood Enhancement Program) and World Bank funded FSAPP (Food Security & Agriculture Productivity Project) covering different project sites.

Between the period 2005-2020, a total of 20,633 acres of vulnerable and degraded land has been restored through various SLM interventions. For the proposed project sites – Dagana Paro, Sarpang and Tsirang Dzongkhags, the total land area brought under SLM are 275 acres, 104 acres, 225 acres and 170 acres respectively. This clearly indicates that very little investments are made in SLM and the farmers in these four proposed project Dzongkhags are undertaking their farming largely with very little sustainable agriculture practices in place. In other words, there is strong need to scale up SLM interventions in these project sites to make agriculture land and farmer's livelihoods more resilient to climate change impacts.

Similarly increasing climate variability and continuing climate change results in productivity losses in agriculture. Insect, pest and crop diseases are often associated with changes in weather patterns thereby incurring crop yield losses in addition to the damages caused by the extreme weather events. Critical adaptation measures to avert these losses mainly involve the generation of weather and climate information. Weather and climate information help farmers to make critical farm decisions and adapt to the changing climate.

The Agrometeorology Program was established under the Department of Agriculture in 2019 to transform climate data into climate information in a way that responds to user needs and assists decision-making to reduce the impacts of climate-related hazards and increase benefits from favorable climatic conditions. To support the Agrometeorology program, expansion and operationalization of the Agromet Decision Support System (ADSS) is crucial for strengthening agromet services in Bhutan as it would provide, real time monitoring, data analysis and comprehensive analytical tools and statistical information to support decision making across a range of temporal and spatial scales. The Agro-meteorology Program will also issue advisories and early warnings against climate related disasters based on climate scenarios with better lead time. Early warnings against natural disasters not only help to save the crop by adopting quick strategic planning. Dissemination of

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<sup>20</sup> *Soil Erosion Report 2010, National Soil Services Centre, DoA, MoAF*

such warnings to the end users on a real time basis with the help of electronic media can become a key factor for crop production and protection.

Therefore, this project component will focus its investment on SLM and Agrometeorology services to enhance resilience of the agriculture sector so that the livelihoods and the food security in the project areas are not put at risk. In particular, the component 3 will focus on the downstream section of the watershed, while the Components 1 and 2 will focus upstream i.e. the watershed management and water conveyance system, which is the overall design and approach of the project.

### **Output 3.1: SLM in vulnerable and degraded areas implemented**

In order to enhance land productivity and make agriculture landscape more resilient to climate change, this project output will seek to scale out existing SLM technologies that have been proven successful and effective in reducing land degradation especially soil erosion and landslides caused by rainfall variation. This will involve promoting two main types of SLM measures – Structural measures (bench terracing & check dams) and Vegetative measures (contour hedgerows & bamboo plantation).

The primary activities proposed under this output are:

- Activity 3.1.1: Participatory SLM Action Planning to validate key SLM interventions (four numbers)
- Activity 3.1.2: Implementation of SLM measures – terracing (1000 Acres), contour hedgerows (500 Acres) and landslide stabilization measures (20 Acres)
- Activity 3.1.3: Technical assistance and support to communities on the implementation of SLM practices in the field (12 numbers)
- Activity 3.1.4: Field-based and specialized training to farmers and agriculture extension staff on SLM technologies (300 Farmers)
- Activity 3.1.5: Learning visits for extension officers on SLM & Climate Change (12 staffs)
- Activity 3.1.6: Monitoring and technical assistance to support communities (12 numbers)
- Activity 3.1.7: Documentation, Knowledge Management (KM) and experience sharing platforms (three stakeholder workshops).

### **Output 3.2: Climate change information, products and services made available and accessible**

This output will support the operationalization of Agrometeorology services in the country for better climate informed digital advisory services. The climate services will be provided appropriately in 19 gewogs and four dzongkhags where other components are implemented so that activities of this project are packaged end to end. The project will mainly support the up-scaling and operationalizing the Agromet Decision Support System (ADSS).

The ADSS ([www.agromet.gov.bt](http://www.agromet.gov.bt)) was formally launched by the Department of Agriculture on 16 March 2021. A Memorandum of Understanding (MoU) is in place between DoA and RIMES to enhance the institutional and technical capacity of officials of the Department of Agriculture particularly Agriculture Research and Extension Division (ARED) and agromet focals based in Agriculture Research and Development Centers, Central Programs (National Soil Services Centre & National Plant Protection Centre) and extension officials. The capacity need is mainly to understand and provide improved agrometeorological advisory and early warning services to ensure preparedness against weather extremes causing damage to various agricultural systems in Bhutan.

During the conceptualization of the ADSS, it was envisaged that the web portal would be scaled up in the remaining dzongkhags. The system needs to be upgraded and improved based on first-hand experience. Currently the weather forecast at the dzongkhag level is integrated in the ADSS and will require the integration of gewog level weather forecast and incorporation of the cropping calendar in the system. The panel also should incorporate pest and disease forecasting and drought monitoring. The activities under the project will mainly entail providing of agro-advisories in major agriculture commodities in the Adaptation Project sites. The agromet services would focus on the following main crops of the dzongkhags.

<b>1.</b>	<b>aro</b>	<b>2.</b>	<b>gana</b>	<b>Da</b>
	• ice		• e	Ric
	• pple		• li	Chi
	• abbage		• us	Citr
	• otato			
<b>3.</b>	<b>sirang</b>	<b>4.</b>	<b>pang</b>	<b>Sar</b>
	• ice		• e	Ric
	• hili		• li	Chi
	• itrus		• us	Citr

The agro-met program will be strengthened further with the enhancement of ADSS through this project and rural communities of project areas using agro-met products and services (agro-advisories) will be enhanced.

Planned activities under this output include:

Activity 3.2.1: Agro-met advisory bulletins appropriately packaged and disseminated timely

Activity 3.2.2: Incorporation of area specific weather and crop data in ADSS

Activity 3.2.3: Capacity building of agro-met focal points based in ARDCs and Central Programs

Activity 3.2.4: Knowledge management and communication activities.

### **Output 3.3: Agricultural disaster risk reduction and management mainstreamed**

Agriculture in Bhutan is vulnerable to a series of climate-induced disasters. Rural communities are often affected by floods, drought, windstorm, as well as occurrence of insect pests and diseases. Less than half of the rural household is irrigated, so the farming system is still dominated by dry-land farming. Localized drought is becoming increasingly apparent and significant. Late onset of monsoon induces drought and affects most of the farming communities especially rice and vegetable farming. The country on the other hand has recorded incidences of climate induced insect pests in the country. In 1996, rice farmers in high-altitude areas lost 80–90% of the crop production to rice blast disease. *Turcicum* leaf blight of maize in 2007 damaged more than 50% of the farmers' harvest. The outbreak of fall armyworms affected 16 of the 20 districts in 2013. Also, in 2008, a severe windstorm destroyed all maize crops belonging to hundreds of households.

Disaster Risk Reduction (DRR) includes observing, detecting, monitoring, predicting and issuing early warning of a wide range of weather, climate and water related hazards. Climate related risk or climate induced risks (drought, flood, windstorm, insect pest and diseases) needs to be mainstreamed into Bhutanese agriculture planning and decision-making processes in order to avert the crop losses caused by extreme weather events. The Disaster Risk Management Strategy of Bhutan 2013 highlights strong need for integration of DRR and CCA efforts and to have environmental and natural resource management approaches as part of DRR strategies.

The following activities are foreseen for project implementation under this output:

- Activity 3.3.1: Initiation of Climate/Farmer Field Schools to bring transformational change by enhancing response capacity to identified risks in four dzongkhags
- Activity 3.3.2: Sensitization, awareness and capacity development on agro-met services to researchers, extension and farmers (10 numbers of sensitization)
- Activity 3.3.3: Development of crop suitability and feasibility maps (eight maps)
- Activity 3.3.4: Pest and disease forecasting services (five plant protection officials).

### **Component 4: Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots**

An integral aspect of advancing good governance in Bhutan has been the gradual process of democratic governance and decentralization, the beginning of which dates back to the establishment of the Tshogdu or National Assembly in 1953, followed by the Lodey Tshogde (Royal Advisory Council) in 1965, the High Court in 1967 and the Lhengye Zhungtshog (Cabinet) in 1972. Later the process of decentralization was enhanced to encompass local governance with the formation of Dzongkhag Yargye Tshogdu (DYT) or District Development Committee in 1981 and Gewog Yargye Tshogchung (GYT) or Block Development Committee in 1991, which resulted in the delegation of administrative and financial powers to the dzongkhag and gewog level respectively.

Bhutan is made up of 20 Dzongkhags (Districts), 205 Gewogs (Block) and 1044 Chiwogs (Villages). In keeping with the Constitution, the Local Government Act of Bhutan 2009 provides for direct participation of the people in the development and management of their own social, economic and environmental well-being through decentralization and devolution of power and authority. The Act stipulates that local governments be established in each of the 20 Dzongkhags, comprising of: (a) Dzongkhag Tshogdu; (b) Gewog Tshogde; and (c) Thromde Tshogde. These are legislated to serve as the highest decision-making body respectively at Dzongkhag, Gewog and Thromde level, and are to be supported by Dzongkhag, Gewog and Thromde Administrations staffed by civil servants. It

provides local governments with a set of administrative, regulatory, service delivery, and financial powers and functions for governance at the local level.

Component four will allow to increase to overall sustainability and coherence of the project by ensuring the involvement of most relevant governance institutions for climate resilience at the local level. It will also ensure the right adaptation activities are identified, prioritized and implemented with the communities, with primary focus on development and management of water resources and rural water infrastructure, specifically drinking water and agricultural irrigation schemes.

This component will specifically develop the capacity, in terms of knowledge and skills, of Local Governments to integrate climate change adaptation in local development investments; institute mechanisms for mainstreaming climate change along with other cross-cutting issues, viz. gender, environmental, disaster and poverty, in local development plans, programs and activities; institute mechanisms in Local Governments for CCA and gender mainstreaming; and strengthening Local Governments and user groups in the communities for effective management of irrigation and drinking water.

#### **Output 4.1: Institutional mechanisms in Local Governments strengthened for CCA and gender mainstreaming**

Strengthening Local Government institutions has been a key programme of the Royal Government of Bhutan since the commencement of the decentralization process in 1981. In the new democratic system, the Local Government institutions have an increasingly important role as frontline agencies for sustainable development, facilitating direct participation of the local communities in the development and management of their own social, economic and environmental wellbeing. A robust system of local governance is also critical for the government's sustainable development policies and programmes to produce direct social, economic and environmental benefits for the local communities, especially the poor and vulnerable groups, and have a far-reaching impact.

This output will focus on strengthening the Institutional mechanisms at Local Government level for mainstreaming climate change adaptation and gender needs in local development plans, programs and activities especially those concerning rural water supply schemes, agricultural irrigation systems and sustainable land management. The respective LGs will play the role of appraising local development plans, programs and activities with the lens of gender and climate change adaptation and ensuring these two issues, wherever relevant, have been mainstreamed. Through the project, the Gewog-level mainstreaming mechanism for CCA and gender will be strengthened. Local Governments and communities will be sensitized and capacitated on mainstreaming CCA and gender in local development plans, programs and activities related to drinking water, irrigation and sustainable land management among others. Capacity development training for LGs on CCA tools, frameworks and approaches and M&E of CCA and gender mainstreaming in the plans, programs and activities of the respective LGs will be conducted.

The following activities are proposed to achieve this output:

- Activity 4.1.1: Conduct sensitization workshop for LGs and communities on mainstreaming CCA and gender in local development plans, programs and activities related to drinking water, irrigation and SLM
- Activity 4.1.2: Conduct capacity development training for LGs on CCA investment and mainstreaming tools, frameworks and approaches



Activity 4.1.3: Carry out M&E of CCA and gender mainstreaming in their plans, programs and activities.

It is foreseen to implement a minimum of four sessions (trainings or workshops) per year, i.e., a minimum of 12 sessions covering the full project area.

**B. Describe how the project provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.**

Bhutan is particularly vulnerable to climate change due to its geographic location and fragile mountainous terrain which invariably affect climate variability, including the frequency and intensity of rainfall, and changes in temperatures. According to the IPCC, climate change projections to 2,100 for Bhutan in particular will lead to increases in average temperatures with relatively warmer weather at higher altitudes and during the dry season, increase in annual average precipitation, and continued spatial variation in temperatures and precipitation due to complex topography.

Expected climate change impacts will place additional stress on ecosystem-based livelihoods and on already vulnerable groups. As such, the project will focus on local level adaptation, increasing potential benefits for exposed or sensitive groups, and act as a force for change towards the foreseen improvements at different levels.

#### **Environmental benefits**

- The project is based on the recognition that resilient healthy ecosystems are at the basis of sustainable natural and human systems.
- The design and implementation of integrated watershed management plans will improve habitat quality and increase biological diversity mainly as a result of protection of the watersheds. In the long run, protection of watersheds will reduce incidences of drying of water sources as a result of extreme climate events like droughts.
- The establishment of PES schemes shall increase collaboration between upstream and downstream communities, opening dialogue and leading to a stronger ownership and stewardship for the natural environment.
- Similarly, the formalization of Water User Associations (WUAs) shall also improve efficient utilization and management of water resources both at the source and at the level of downstream users. WUAs will be enabled to perform systematic monitoring of the status of water availability, leading to better decision making towards the effective recharge of catchment areas.
- Replicating successful irrigation systems are also expected to minimize negative environmental effects such as landslides often due to poor maintenance of open irrigation canals.
- Further, proposed technologies including hydro-pressure pipes reduce water losses due to uncontrolled spill overs and evapotranspiration.
- Successful SLM and climate-smart agriculture will also reduce topsoil erosion and combat land degradation, which in long run would enhance soil

fertility and soil microbial biodiversity. In addition, SLM is also recorded to increase biodiversity in and around the cultivated lands.

- User-friendly climate information, products and services will also improve planning and prevent environmental disasters. For instance, work on steep slopes for any developmental activities could be halted on the basis of objective information related to climate change and impacts on specific locations & watersheds.
- User-friendly climate information for the farmers would also increase crop productivity, which would consequently reduce demand for collection for non-wood forest products NWFPs, thereby reducing disturbance to natural habitats.
- Improved adaptation planning at LG level will improve the holistic vision of communities, on how they can build climate resilience by managing their surrounding natural resources.
- LG involvement will also strengthen the institutional channels to implement a coherent approach for the management of water all the way from source to end-users.
- A Gender Action plan has been developed through stakeholder consultation process. Implementation of the GAP will ensure that risks related to gender are managed and enable that decisions, actions and benefits from the project are gender inclusive. This will be taken care by ensuring the a minimum of 30 percent of participants in project related consultations, meetings and trainings comprise of women participation.
- A project level ESMP has been developed based on risks and impacts identified by the project stakeholders. Implementation of a the ESMP will ensure the social and environmental impacts of the project are mitigated or minimized and there will be no negative adverse environmental or social impact arising out of the project activities.

### **Economic benefits**

- PES schemes are expected to provide additional income for upstream communities responsible for watershed management.
- Users will directly benefit as continuous supplies of water reduce the economic burden of seeking alternatives in case of erratic water supply. In the long run, it shall also reduce vulnerability of the users from the risk of water sources drying-up.
- Increased incomes, through PES schemes, collection of NWFP and increase in agriculture productivity, will have a significant impact on reduction of poverty in vulnerable rural communities across Bhutan.
- In addition, more stable income will also improve the capacity of poorer groups to take advantage of any positive impacts of warmer climate in their locality.
- In a near future (in a few years), habitat enrichment within managed watersheds can increase biological diversity translating into increase in provisioning ecosystem services, such as: increased availability of non-wood forest products (NWFP) like cane, bamboo, mushroom, fiddlehead ferns and many others which are commonly harvested to supplement household income generation.

- The proposed project will strengthen the resilience of irrigation infrastructure to the impacts of climate change, reducing loss and damage costs including economic loss related to climate change induced extreme events, thereby releasing some pressure from public resources of the increasing recovery costs.
- The improvement of the irrigation schemes will increase agricultural productivity, i.e. increase of paddy yield and possibly allowing for double cropping of rice and vegetables.
- The climate resilient irrigation water will provide a flexible and more reliable water supply and promote diversification to higher value crops as well.
- The water harvesting technique will largely employ the use of natural material - which is cost effective.
- The installation of climate resilient irrigation water, SLM and climate-smart agricultural practices will increase crop productivity. By using proven technologies for terracing slopes of more than 25 degrees, sites will serve for demonstration purposes for replication by other farmers. These are among the proposed solutions for Bhutan to increase arable land, which is currently only less than three percent of total land area.
- Watershed management also intends to decrease downstream sediment load, which can decrease Bhutan's hydro-power dams' efficiency and limit energy generation, which is one of the major exports for Bhutan.
- Enhanced awareness of community members (at least 30% women) on water governance and management will lead to better and gender sensitive decisions for maintaining production and protection of community and household assets including those of vulnerable communities.

## Social benefits

- Women are affected by their greater vulnerability to climate risks, linked to their greater dependence on natural resources. The proposed climate resilience interventions for agriculture and natural resources proposes various social protection measures for high priority groups including women and children.
- The proposed integrated water resources management both for drinking and irrigation is expected to increase water availability and dialogue among communities, reducing the number of disputes over water in the long run. There are numerous cases in Bhutan where irrigation and drinking water disputes between communities were being only resolved through interventions of the court. These solutions only partially contribute to social wellbeing.
- Formalization of WUAs shall lead to equitable sharing of water resources among the community members and notably at the grassroots, and make significant contributions to enabling inclusive decisions related to water governance and management.
- Active participation by the community members during watershed management, PES schemes and implementation of SLM is also expected to improve social capital of the community for instance through revitalization of traditional labor sharing during SLM implementation.
- The project will also assess current policies and work towards creating more inclusive and enabling policy environment for enhancing

coordination and collaboration among stakeholders, including a stronger participation of those whose voices are usually less heard.

- Inclusive participation in adaptation planning will also shed light to the needs of marginalized groups of people, including women, children, and the elderly.
- As such, the local climate resilience interventions that will be planned at LG level will promote the protection of economic and social rights through vulnerability reduction and support for disaster risk reduction.
- The ESMP identified prioritizing award of project works on contractual arrangements during project implementation period so that vulnerable communities and households who cannot afford to participate in project activities do not get excluded from benefiting from the project.

## **Avoidance / mitigation of potential negative impacts**

The BTFEC is mandated to promote environmentally sound and sustainable development in the full range of its activities. As such, the screening of projects for the identification of potential negative impacts is part of its internal processes and described in the following sections on Risk and also on Monitoring and Evaluation.

Due to the nature of the intervention, which is specifically based on the improvement of the environment and focusing on societal benefits, and to the mandatory compliance with national regulations and standards (see section E), no negative impacts are expected.

Yet, specific studies will be conducted, in each component, to better understand the potential effects of the proposed activities, with special emphasis at environmental and social level. Identified risks, even small, can then be associated to a mitigation proposal. This is important specially in a fragile environment with competing uses on natural resources.

For instance, the studies will improve knowledge of hydraulic dynamics between surface and groundwater, so as to guide decision making on their use. At the same time, environmental needs will be taken into consideration for the water resources management in each river basin.

As another example, SLM interventions such the establishment of contour grass hedgerow and stone bunds across the slopes will reduce soil erosion and enhance soil nutrient and soil moisture conservation. This will also help reduce sedimentation in the main river system thereby lowering the negative impacts on aquatic biodiversity and the settlements downstream.

### **C. Describe or provide an analysis of the cost-effectiveness of the proposed project.**

The proposed scope and approach were selected as they address the particular adaptation challenges that Bhutan is facing. The alternative “business as usual” scenario would be outclassed by the following points.

In the Bhutanese context, with natural resources being put at the center of the society and of the economy, Ecosystem-based Adaptation (EbA) is the most sustainable and cost-effective way of enhancing resilience and reducing vulnerability to impacts of climate change. Not only ecosystem-based adaptation to give the basis for human systems to thrive, notably due to vigorous provisioning services, it is also expected to enhance resource management. In the case of water, sound EbA backed by an integrated watershed management approach will eventually reduce cost of water treatment processes at user ends.

The mountainous background also explains the importance of adopting an integrated watershed approach, as uphill/downhill resources are, despite the administrative boundaries that may exist between them, intimately related.

Water is a key sector for increasing agricultural productivity as well as improving public health and hygiene. Developing climate resilient infrastructure through the use of environmentally friendly and durable infrastructure directly contributes to a transformational change for Bhutan, where more than 60 percent of the population is still engaged in the agricultural sector.

In terms of irrigation technologies, the proposed interventions include HDPE pipeline and climate-smart technology which in the long run has minimal maintenance cost. Such interventions also have a high efficiency level of water usage. Also, and given the mountainous terrain, piped irrigation compared to open conventional irrigation channels shows more adaptive benefits.

Indeed, the alternative options for irrigation would be to build the schemes with conventional concrete lining or with concrete structures which is cheaper than the proposed intervention. However, this option will not be cost effective in the long run due to the following reasons:

- The concrete channel has a shorter lifespan (Maximum 10 years) than the HDPE pipe irrigation scheme which has a lifespan of minimum 50 years.
- The concrete channel has high maintenance cost compared to pipe irrigation schemes.
- The open concrete channel is more vulnerable to climate risks offering little resilience to extreme events - leading to blockages and water loss through seepages which in turn can trigger catastrophic slope failures and massive landslides causing negative environmental impacts and risks. This negative impact can have a substantial environmental cost as part of the mitigation measures.

Hence, while upfront cost for pressurized piped irrigation schemes is higher than traditional open channels, it is increasingly proving to be the most efficient, reliable, and sustainable scheme. Interventions on irrigation from other donors and development partners such as GEF-LDCF and GCF are also focused on building pressured piped irrigation which is the most suitable and resilient scheme for a highly vulnerable mountain ecosystem.

The percentage of arable land according to the RNR census of Bhutan 2019 was estimated at 2.83 percent. Hence, Sustainable Land Management (SLM) offers a holistic approach which would not only improve the soil fertility but in the long run it is proven to bring in numerous ecological benefits besides just increase in agricultural productivity. SLM technologies such as bench terracing helps retain soil and water in sloping land thus enhancing soil fertility and increased agriculture productivity and prevent land degradation. Further, bench terracing also enables farm mechanization and with gender friendly farm machineries, it also contributes to narrowing gender gap in the agriculture sector. Such interventions are expected to promote youth engagement in the agriculture sector thus helping address youth unemployment issues and minimize rural-urban migration which ultimately will help contribute to achieving national food and nutrition security.

In close relationship to SLM, the proposed value-chain assessment of essential vegetables is in line with the increasing trend in vegetable cultivation in Bhutan. The proposed studies are expected to diversify income generation for rural communities and at the same time food and nutritional security for all including women, children and the elderly.

Various types of land degradation occur in Bhutan at various scales and degree. Amongst the land degradation types, water induced degradation, e.g. gully, landslides & ravine formation, is more prominent and devastating. Wind and cultivation erosion are also extensive as is in-situ degradation such as depletion of soil organic matter, nutrient mining, topsoil capping and subsoil compaction. All these contribute to reducing agricultural productivity and impairing the livelihoods of the people of Bhutan. Older farmers commonly report crop yield declines of 30% or more due to the soil “being tired” (SFU, 2001)<sup>21</sup>. Therefore, the proposed technologies are found to be more cost effective to maintain the soil fertility in order to improve the livelihood of the communities residing within these project sites.

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<sup>21</sup> Report on Agroforestry and Soil Fertility Survey in Bhutan. Soil Fertility Unit, Ministry of Agriculture, Thimphu, Bhutan.

The proposal also tackles the issue of knowledge and decision making. Often there is a huge amount of climate data available, including for researchers and policy makers. However, it is not packaged in a useful way for day-to-day use at the grassroots level, for instance, by the farmers. Thus, the project is expected to develop Agrometeorological services and products, which are user-friendly and easily accessible at grassroots level so that impacts of climate change and climate induced disasters can be significantly reduced.

Forming community-based groups such as Water Users Associations and formalizing such groups is also expected to increase project impact at the grassroots level. The groups are responsible for effective operations and maintenance of the interventions at the grassroots level thereby enhancing greater community ownership leading to its sustainability. The project activities are expected to be mainstreamed as a key responsibility of such community-based organizations.

Local Governance capacity building and also capacity building of engineers will improve identification of climate change impacts and ensure climate change adaptation measures are mainstreamed into local government plans and programs in terms of ensuring climate resilient infrastructure and interventions.

Further, the expected results are part of the targets set in the existing plans at national level. As an example, ensuring 24x7 safe drinking water supply for each and every household is the target set to be achieved by 2023. Yet, the available means are not sufficient to cover all needs in the country. This proposal intends to reach the set targets in four particularly needing Districts, independently of other sources of finance.

Last but not least, benefits will be produced beyond the project period as local ownership of natural resources management will be increased, notably through participatory approaches, sustainable practices put in place, equipment will be durable, and financial flows will remain through Payment-to-Ecosystem Services (PES) schemes.

Watershed management and PES give additional conservation benefits, provide incentives to communities for conservation, as sources are drying-up due to climate change and therefore, interventions are necessary to ensure recharge areas and protection of water sources and management of watershed areas.

**D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.**

The proposed project is in line with the Royal Government of Bhutan's Water Flagship Program. Taking into consideration the role of water towards sustainable socio-economic development, the Water Sector has been accorded a top priority by the Royal Government of Bhutan. Therefore, the proposed project is in line with the Government's Water Flagship Program that aims towards providing access to 24\*7 safe drinking water and irrigation to both rural and urban households. Towards this, the strategies identified include declaration and protection of critical watersheds, putting in place adequate and climate resilient water infrastructure, improving the quality of drinking water and strengthening the water legislation and governance.

The proposed project will contribute towards the achievement of the five of the 17 National Key Result Areas (NKRA) of Bhutan's National Development Plan i.e. 12th Five Year Plan (2018 to 2023). Those five NKRAS are:

1. NKRA 3: Poverty eradicated and inequality reduced
2. NKRA 5: Health ecosystem services maintained
3. NKRA 6: Carbon neutral, climate and disaster resilient development enhanced
4. NKRA 8: Food and nutrition security ensured
5. NKRA 17: Sustainable water ensured

The NKRA is a development outcome at the national level that will contribute towards achieving the overall objective of the 12th Five Year Plan. In total the plan identified 17 NKRAs, which are all closely aligned to the Sustainable Development Goals with their targets and indicators integrated into the 12th Five Year Plan.

Bhutan is currently working on development of its first National Adaptation Plan with a focus on the water sector. The proposed project will complement and supplement the implementation of ongoing assessments being carried out in the water sector. Furthermore, the proposed project is in line with the National Environment Strategy (NES), 2020. The NES, 2020 based on the situational analysis and the current challenges proposed improving access to safe drinking water and sanitation and implementing integrated water resources management.

Bhutan in its first NDC outlined the ten broad areas of priority adaptation needs. The integrated water resources management adoption of appropriate technologies, climate proofing water distribution systems and integrated watershed and wetland management were identified as some of the adaptation measures in the water sector. The proposed project is in line with the first NDC.

Bhutan submitted its 2nd NDC in June which highlights the mitigation options and outlines that the adaptation component will be identified in its National Adaptation Plan which is under formulation and is expected to be ready by 2021. The NAP will cover priority needs in water, agriculture, forests and biodiversity and health. Some of the priorities highlighted from the draft document include development of a database system for drinking water, strengthening and formation of WUAs, and climate proofing water infrastructures. The proposed project is built on the findings and assessment carried out for NAP formulation.



The proposed project is also in line with the National Agriculture sector's 12th Five Year Plan.

<b>Project Component</b>	<b>NKRAs (2018-23)</b>	<b>SDGs (2015-30)</b>	<b>9 GNH Domains (Long term)</b>
Component 1 Component 3	NKRA 3: Poverty and inequality reduced	Goal 1: No poverty Goal 10: Reduced inequality	Living standard Good governance
Component 1	NKRA 5: Health ecosystem services maintained	Goal 11: Sustainable cities and communities Goal 15: Life on land	Ecological diversity and resilience Good governance
Component 1 Component 2 Component 3	NKRA 6: Carbon neutral, climate and disaster resilient development enhanced	Goal 7: Affordable and clean energy Goal 9: Industry, innovation and infrastructure	Ecological diversity and resilience Good governance
Component 2 Component 3	NKRA 8: Food and nutrition security ensured	Goal 2: Zero hunger	Living standard
Component 1 Component 2 Component 4	NKRA 17: Sustainable water ensured	Goal 6: Clean water and sanitation	Living standard Health Ecological diversity and resilience

**E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.**

The implementing entities are committed to complying with all legislation and applicable Environmental and Social requirements. Overall the project activities will be within the context of requirements of National Environment protection Act 2007. Other compliance requirements with regulation are described in more detail at component level:

In order to achieve the foreseen related to the implementation of watershed management plan, scaling up of PES schemes and wetland management, activities shall be in line with the following:

- Forest and Nature Conservation Act 1995,
- Forest and Nature Conservation Rules and Regulations of Bhutan 2017,
- PES Framework for Bhutan 2015,
- Bhutan Drinking Water Quality Standards 2016 and Wetland Inventory Framework.

All the SLM interventions, particularly terracing will be done in line with the following guidelines and modalities.

- Agriculture Land Development Guidelines (ALDG) 2017 of the Ministry of Agriculture & Forests

- Implementation Modalities for Agriculture Land Development and Fallow Land Reversion, circulated to all the implementers vide letter No. DOA/ARED/Adm-01 /2019 dated 30th September, 2019
- Soil Conservation Manual (SCM), 2019 of the National Soil Services Centre, Department of Agriculture, MoAF

As for infrastructure for improving access to drinking and irrigation water, larger scale constructions will require environmental and social clearance starting with an Initial Environmental Examination (IEE) to the competent authority.

Further, extraction of water resources has to be in line with Water Act of Bhutan 2011, and Bhutan Drinking Water Quality Standards 2016.

The proposed irrigation activities are in line with the National Irrigation Plan, and no more review is required in that sense.

Activities for the promotion of climate smart agricultural practices and improvement of water governance shall be aligned with:

- Land Act 2007,
- Bhutan Water Policy 2008
- Water Act of Bhutan 2011
- Water Regulation of Bhutan 2014.
- Agriculture and Land Development Guideline 2017.

During the implementation of the project, the implementing entity and the other executing entities must comply with the standards of the Adaptation Fund. This project is compliant with the various laws that relate to the implementation of the project's activities, such as environmental, agricultural and water resource acts and relevant laws. Direct involvement of related line Ministries and local authorities add strength to the compliance and alignment with national laws, policies and guidelines. The line agencies have consulted during project design and development through their respective representatives in the project development task force and several consultations to ensure that activities comply with relevant national standards.

All project activities related to infrastructure will require environmental and social clearance. The project will receive either guidance or the required authorizations, clearances, licenses through different agencies at the local government level of central agencies as per the established delegation of power for environmental clearance. Such clearances will be accompanied by conditions that ensure environmental and social

**F. Describe if there is duplication of project / programme with other funding sources, if any.**

The DA, Gross National Happiness Commission (GNHC), is the apex planning and coordination body of the Royal Government of Bhutan. It notably ensures that any developmental activities in the country is in line with governments' priority as well as ensuring no duplication between project interventions. Any external or internal funding of any kind in Bhutan irrespective of implementing agencies has to be routed through the Commission.

The GNHC confirmed and will ensure that the current proposal is in line with the national priorities and there is no duplication and has synergy with other project interventions.

The proposed project area includes the Districts of Paro, Dagana, Tsirang and Sarpang. The initial proposed project was limited to the districts of Paro and Dagana (concept note stage). However, due to the changing ground realities and the urgency to implement some of the key activities proposed during the concept note, it is proposed to include three gewogs in each of the two new additional Districts of Tsirang and Sarpang.

The proposed project is complementary with some of the ongoing and pipeline projects financed through GCF, GEF and GEF-LDCF.

The GCF financed UNDP project on Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan supports resilient agricultural practices in 8 Dzongkhags of Dagana, Tsirang, Sarpang, Punakha, Wangdue, Zhemgang, Trongsa and Samtse. The project mainly supports interventions to integrate climate change risks into water and land management practices that affect smallholders and in reducing the risk and impact of climate change induced landslides during extreme events that disrupt market access. The Dzongkhags of Dagana, Tsirang and Sarpang are common and provide opportunities for seeking synergy in terms of water management and sustainable land management. The GCF Project 'Supporting Climate Resilience in the Agriculture Sector' targets 8 dzongkhags where the project locations are spread widely. GCF-Agri project in Sarpang covers gewogs of Sershong, Umling, Samtenling and Sompangkha. The two gewogs of Sershong and Chuzergang under the AF project (which happens to be the project location of the GCF Project) will be carried out in such a manner that the chiwogs (sub-block/village) uncovered will be materialized.

In Tsirang, GCF Project envelops Mendrelgang, Kikorthang, and Sergithang which are beyond the project scope of AF.

Under Dagana, GCF covers Dorona, Khebisa and Lhaimoizingkha. AF interventions in these gewogs will be concentrated in SLM as water schemes are currently being financed through GCF support. The synergies between these projects will be ensured by carrying out consultative process between the projects in implementation to inform each other of the best practices emerging out of the projects. GNHC as the central coordinating agency will ensure coordination framework between two projects are put in place by leveraging the existing practice such as national and annual implementation month and performance agreement of the agencies.

Overall, since the implementing entity for both the GCF project and AF project is based at the GNHC (as NDA and DA to GCF and AF respectively), the projects will be coordinated systemically through better collaboration and non-duplication, ensured mostly through the PMU coordination.

The recently approved GEF and UNDP project on Ecotourism focuses on mainstream biodiversity conservation into tourism development. The project focuses on the eastern and south-central districts of Bhutan which are not within the proposed areas of the present proposal for the Adaptation Fund.

The recently approved project concept note under the GEF-LDCF on advancing climate resilience water sector in Bhutan covers the Dzongkhags of Thimphu, Wangdue, Tsirang, Sarpang and Punakha, i.e., also in other locations than the present proposal.

IFAD funded “Commercial Agriculture & Resilient Livelihood Enhancement Program” presently concentrates on the project sites that are centric to the eastern part of Bhutan namely Lhuntse, Trashiyangtse, Mongar, Tashigang, Pemagatshel, and Samdrupjongkhar, these project sites are beyond the scope of the project landscape identified in the AF project.

Further, the IFAD project emphasizes mostly on the commercial farming practices such as crop cultivation and livestock sciences, market chain and enterprising activities including the upliftment of farmer’s groups and cooperatives, with a peripheral concentration on irrigation and land development. On the other hand, the AF project solely emphasizes water and land development where adaptation measures will be integrated, where rigid and solid activities will be carried out through the apportioned amount, which further justifies the concentrative approach in contrast to the IFAD project where commercialization has come out as a centerpiece. Moreover, the lessons learned and documented from IFAD project will be used in the implementation of AF proposal.

Since the project landscape identified in the AF project is not intervened by the IFAD program, it is at the planning mechanism of GNHC where duplication is reduced. There GNHC as the planning commission of Bhutan will ensure that the project is well aligned to the national goals with no duplication

**G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.**

Knowledge management will be an important part of the project to ensure the sustainability of climate change adaptation goals and also to allow the learning from the project are replicated in other areas in the future. The implementation of all project outputs will be based on participatory approach involving all the stakeholders and it will be geared towards knowledge management. This will ensure that the capacities of the parties involved are built as they participate in the implementation processes.

The project will seek to establish and strengthen existing knowledge management system and establish appropriate models of communications to disseminate information on climate change adaptation across areas of program implementation. The key lessons learnt and best practices will be documented for wider dissemination and policy mainstreaming. Eventually there will be an increased knowledge base on climate change adaptation for better decision making at all levels.

Further, the lessons learnt from the project will be documented and shared through meetings and publications with other communities for replication. Knowledge exchange mechanisms through study visits will be promoted among communities and organizations as well as capacity building to understand and implement adaptation measures will be fostered.

Potential outputs include:

- |  |   |
|--|---|
| •  | Evaluation material, disseminating lessons learned and    |
| • key results of the project             |   |
| •  | Improved data management                                  |
| •  | Improved interpretation and dissemination capacity        |
| •  | Policy information sharing and mainstreaming              |
| •  | Cross-cutting capacity building (other capacity will have |
| • to be built into relevant components), |   |
| •  | Success stories or stories of change                      |

Through this knowledge management activity, the project will ensure that the information and knowledge culminated or gathered during the implementation of the project will be documented and

made available for the wider reach of future project implementers. This is aimed in line to replicate and make realistic experiences, readily available to scaling-up of similar project results in the future. Further, case studies and technical reporting of the project aim to capture the lesson learnt and best practices notwithstanding the indigenous (traditional) methods of technicality, so that those documents are available for national and international meetings.

The project will cover targeted communication strategy for the systemic documentation of project process and its functional achievements, which will be published and shared emanating from the project activities and knowledge sharing events through platforms such as social media and the official website and government portals. The project also aims to develop project communications strategy through a consultative process, to have information reported based on it and for timely update of information and experiences so that all necessitated data are regularly compiled and delivered while reported grievances are addressed for the cyclic process of bettering the project.

Further the project will involve local people at the grassroots, such that the interaction and collaborative work experiences will enhance transfer of technical knowledge from field experts to local people, which subsequently will aid to meet the skill requirements of local people for future project maintenance. The project will be realized through the recruitment of available national manpower so that the knowledge and its management is well scoped during the implementation of project activities.

The project will also cover long term study programs so that the existing human resources are professionally and scholastically equipped; and technically competent experts at national level are produced, tasked to develop and manage future water projects in the country. This manpower skill upgradation sustainably enables continual flow of skills and knowledge from one project to other, and build pool of national experts in realizing project goals.

Additional elements related to capacities in knowledge management in each of the 4 components include the following.

### **Component 1: Adaptive management of watershed for enhancing resilience of community**

The project will focus on strengthening the institutional, financial and human capacities for long-term management and M&E for integrated watershed management, aiming at water sources that are well protected. This will include review of existing studies and strategies, mapping the gaps and enhancing these strategies. This will include human resource development mainly training the field staff for improved management of water sources and also creating awareness and empowering communities in water management mainly through PES. Further assessments on watershed in light of climate change with appropriate interventions will be carried out and information disseminated to various field officials for future adaptation measures. A reliable wetland monitoring system which is currently lacking for the project sites will be developed, taking particular advantage of emerging technologies for innovative solutions. This monitoring system will guide the planning process particularly the developmental activities take into consideration the vulnerability issues.

‘Water Inventories Mapping’ will be carried as part of the project activities wherein, the comprehensive study on watershed resources, its discharge potential and beneficiary records are compiled in view to understand the water resource landscaping in the country and to act as a point of reference to

validate future study and analysis hovering the similar scope undertaken by the project under the Adaptation Fund.

## **Component 2: Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation.**

The knowledge management under this component underscores recording of the indigenous and traditional best practices that are applied by local people in the supply of water for drinking and irrigation. Additionally, the project will involve local people at the grassroots, such that the interaction and collaborative work experiences will enhance transfer of technical knowledge from field experts to local people, which subsequently will help in meeting the skill requirements of local people for future project maintenance. The project will be realized through the recruitment of available national manpower so that the knowledge and its management is well scoped during the implementation of project activities.

Further, case studies and technical reporting of the project under this component aim to capture the lessons learnt and best practices from the implementation of the project. The Climate angle perspectives and narratives will be documented so that related information and statistics will be made available for the benefit of future projects.

As for the baseline, there is a lack of technical capacity and awareness in integrating adaptation measures into the water sector, which is also one of the most vulnerable sectors to climate change. Taking this into consideration, the project will build capacity of engineers in the integration of climate change adaptation measures in water management planning and implementation. The project will also document the best practices of climate resilient water management demonstrated in the project sites and the knowledge will potentially be disseminated through conferences and workshops to other parts of the country for the purpose of replication.

The lessons learned from involving the communities through Water user associations will be documented. This will be used to increase awareness among the communities on good practices of water management.

## **Component 3: Climate-smart agriculture through sustainable land management and informed Agrometeorological services**

This component will notably ensure that lessons learnt from GEF-LDCF namely NAPA III and the GCF programming in the agricultural sector are available notably to project implementors in the sector. The implementation of this component will also holistically compile all relevant related to agrometeorology and sustainable land management, also to serve future projects.

Notably, SLM related activities also contribute to the overall national target set forth in the Land Degradation Neutrality objectives of the UNCCD. Hence, SLM related information will have a national reach as for knowledge components.

## **Component 4: Improved local Governance for effective Climate Change Adaptation (CCA) mainstreaming with focus on water management at the grassroots.**

Under this component, capacities of the local government officials will be built particularly in mainstreaming climate change adaptation with a focus on the water sector in local governments. Local governments play a critical role in ensuring climate change adaptation measures are mainstreamed and sensitized to the local government officials. Lessons learned from this project will

be taken forward to inform national planning processes and incorporated in future climate change adaptation projects. Further, LG through this exchange of knowledge will help to integrate activities aimed at increasing climate resilience into other socio-economic activities.

**H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.**

Under each of the component, lead agencies have conducted stakeholder consultations, including with the local government, community leaders and community groups. A number of far-flung communities considered as vulnerable groups were also included. It is the government's priority that such groups are considered and benefit from any form of project. In most of the meetings, presence of women and youth were also ensured. Consultations were also the opportunity to confirm communities' sensitivity to environmental and social safeguards.

Details of consultative processes under each component are indicated below:

**Component 1:**

Preliminary watershed assessments were initiated in collaboration with all the stakeholders in the watershed of Paro and Dagana districts. Before the start of the detailed assessments to be performed under this proposal, courtesy visit is made to district administration to seek their support and apprise about the assessment and the need to carry out the same. Consultative workshop will be held with all the relevant agencies at the district level to create awareness on the watershed management and to seek information on the watersheds in the district.

Similar workshops will be held at the block/village level comprising of representatives of agencies and communities to create awareness and get their understanding on the watershed status from the local perspective.

Training on the use of guideline for watershed classification will be provided to staff at the block level, who will carry out the assessments. They will be technically backstopped by relevant line agencies and supported by knowledgeable community representatives.

Participation of the various workshops and consultations often simply depends on availability in the locality irrespective of gender, but consultations will make sure to get the perspectives of both women and men while carrying out assessments.

**Component 2:**

As a part of the recent consultative process held during the formulation of the national priority programs for the 12th Five Year Plan, several villages were involved and their views were incorporated in the "Water Flagship Program Access to 24x7 Safe Drinking Water with Irrigation - 2019" on which Component 2 is based. Besides, the specific context (ground situation) and the difficulties faced by communities in terms of water for drinking and irrigation were also studied.

**Component 3:**

Under this component, consultations were performed according to the requirements as defined by the Ministry of Agriculture and Forest prior to this proposal formulation. The land use mapping conducted by the MoAF have clear indications of different aspects of land use and related challenges, including at social level.

#### Component 4:

In regard to formation of Water Users Associations (WUA), an in-depth consultation was held with the local government of Paro, one major project dzongkhag. Further detailed analysis of Environmental and Social Safeguards, and Gender analysis, shall be required according to local infrastructure to be set, in line with National Regulation.

Focus Group Discussions (FGD) were held with communities' representatives of the project Dzongkhags and Gewogs to understand gender roles and challenges in water and water resources management at different levels. These FGDs were held in the context of understanding that "Gender Equality implies a society in which women and men enjoy the same opportunities, outcomes, rights and obligations, in all spheres of life. Equality between men and women exists when both sexes are able to share equally in the distribution of power and influence; have equal opportunities for financial independence through work or through setting up businesses; enjoy equal access to education and opportunity to develop personal ambitions. A critical aspect of promoting gender equality is the empowerment of women, with a focus of identifying and redressing power imbalances and giving women more autonomy to manage their own lives.

The participatory assessment of gender situation revealed the following;

- All Gewogs in the project area have a practice of establishing a Water Users Association (WUA) for oversight management of drinking or irrigation water schemes amongst households using water from a facility. The office bearers of these WUAs comprise of Chairperson, Secretary and a Treasurer. Overall women representation comprises of only 11 percent of the office bearers for WUAs in the project area. Most of these WUAs are recognized by the Gewog Administrations. However, they are not formally registered and members officer bearers of these WUAs needs training in water governance, management and water dispute resolutions.

During participatory assessment of gender roles and capacities, the stakeholders identified the need to enable higher level of participation by women in governance and management institutions. Hence, it is proposed that the project should support enabling;

- Formal registration of all WUAs in the project areas with enhance participation by women. For this the project should provide capacity building of WUA office bearers in
  - Awareness on water act
  - Water regulations
  - Group formation and management
  - Water source sharing
  - Conflict and dispute resolution
  - Labour regulations and Labour Safety
  - Roles and responsibilities of stakeholders in water management
  - Gender equity in water management
  - Mechanism for distribution of water
  - Innovations for sustainability in water management such as introduction of fees and PES mechanisms
  - Management of WUAs
  - Record keeping.
- The project should aim to raise the representation in officer bearers of WUAs by women from 11% to 20% by end of the project period and
- That usage and management of water largely handled by women at the household level and by men at the Dzongkhag level. There is a gap between the majority of end users of water, who are largely women, at household levels and decision makers in the management of water at the Community and Dzongkhag levels who are largely men.



- Within the project Dzongkhags the Dzongkhag level, 100 percent of Dzongkhag Tshogdu (DT) chairperson; 75 percent of Deputy Chairperson, 100 percent of DTY Secretary and 78 percent of members are men. The representation of women in the Gewog Tshogde GT is 29 percent as compared to 22 percent at the DT level. Women lack influence within existing water governance and management institutions, limiting their ability to change the redistribution of power and affect decisions. Training and capacity building would be required for women to engage in public decision making.
- Men play a greater role in maintenance of water related infrastructure. However, women also take up significant roles in maintenance of infrastructure at community and household levels which indicates the need for enabling participation by women capacity building for water maintenance, use of tools and equipment and in promoting improved tools and technologies in water maintenance at local levels. However, 90 percent of the participants view that men have enjoy better access to training opportunities a than women. Given the significant role that women play in maintenance of infrastructure at the community and local levels, the project support in terms of training opportunities in water infrastructure should include equal participation by women. Women have a greater role in use of water for cooking, cleaning, watering livestock and kitchen gardens as compared to the greater role of men in use of water for field irrigation. In situations where water facilities are not maintained at the local levels, women would land up facing the larger brunt of dealing with lack of water supply and hence would find more value in having skills and capacity for water maintenance. Training women on efficient and economic use of water would also enable efficient utilization limited water resources. Therefore, the stakeholder consultations in gender proposed inclusion of training on practical and technical measures to enable both men and women at grassroots to enhance their skills in water management at local level. The type of skills and capacity required by the stakeholders, as identified during the stakeholder consultations included skills in;
  - Water distribution and management
  - Efficient/economic use of water
  - New applicable technologies in water management
  - Use of maintenance tools and equipment
  - Plumbing and minor maintenance at HH and community level
  - Climate resilient and efficient design of water infrastructure.
- Women largely have a higher level of control over decisions related to buying and selling of commodities. They stand very low in terms of control and access to production tools and equipment, transportation matters, information and training opportunities.
- In the project area, access and control over land resources are dominated by men indicating that men play a significantly larger role in decision related to buying and selling of land or in terms of cultivation and use of land resources. Men also play a larger role in irrigating agriculture land except in the case of kitchen garden which is a dominated by women.
- Men do have better access to financial capital over women such in in actual spending. However, the control and therefore for decisions related to spending, investments, borrowings or lending are dominated by women. Therefore, there is a need to enhance this capacity by including women in trainings related book keeping.
- A survey on gender and climate change in Bhutan reported that 84 percent of men in Bhutan are aware of climate smart and climate resilient agriculture as compared to only 68 percent of women being aware of the same. It also reported that higher proportion of males enjoy access to information, training and inputs related to climate smart agriculture<sup>22</sup>. The PPG stakeholder

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<sup>22</sup> *Gender and Climate Change in Bhutan, CNWC, 2020*

consultations in the project areas also observe that men have better access and control over information, tools and training. The fewer opportunities for women relative to men to obtain skill and development training limit their participation in and the benefits they may gain from the use of new water technologies. Therefore, stakeholder consultations and meetings of the project should make concerted effort in creating awareness on impacts of climate change and technologies for improved water management.

- The Gender Assessment, therefore, recommended;
  - Enhancing participation by women in project activities, particularly in training and capacity development activities; Supporting establishment of formal (registered) through capacity building and enabling formal registration of WUAs; ensuring that 30 percent of officer bearers in these WUAs comprise of women and that all trainings and workshops involving local communities achieve a 30 percent participation by women. The training needs are identified (See gender Assessment and Action Plan in Annex);
  - Awareness on water act; Water regulations; Group formation and management; Water source sharing; conflict and dispute resolution; Labour regulations and Labour Safety; Roles and responsibilities of stakeholders in water management; Gender equity in water management; Mechanism for distribution of water; Innovations for sustainability in water management such as introduction of fees and PES mechanisms; Management of WUAs and record keeping.
  - Climate resilient management and maintenance of water resources and infrastructure covering topics on Water distribution and management; Efficient/economic use of water; New applicable technologies in water management; Use of maintenance tools and equipment; Plumbing and minor maintenance at HH and community level; Climate resilient and efficient design of water infrastructure
  - Facilitating women and men's equal participation in and access to benefits project activities. Support the empowerment and leadership-building of rural women, and their full and meaningful involvement in the water resources and water management. Enable rural women to participate actively in WUAs.
  - Enhancing education, and conduct awareness-raising and advocacy on adaptation to climate change through climate resilient water management through training sessions and social media.
  - Putting in place, a grievance redress mechanism at the start of the project to ensure a formal process for addressing concerns or complaints raised by individuals (particularly women) or groups affected by the project implementation activities. Both concerns and complaints can result from either real or perceived impacts of operations and may be filed in the same manner and handled with the same procedure. Measures should be in place to avert and mitigate conflicts arising out of project implementation including unequal distribution of water.
  - Appointment of a Gender Mainstreaming Specialist to ensure that gender equality and safeguards are fully built into project activities. The expert will identify gaps and support in capacity building and provide training to project staff and key stakeholders.

The details of gender assessment and ensuing gender action plan is annexed.

**I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.**

The rationale of selecting only four dzongkhags is to deliberately create a critical mass of activities in the beneficiary areas, ensuring both focus and impact at the level of entire watersheds. The project size ensures that upscale at district level is feasible while also allowing activities to be financially independent from other sources of finance.

The “**business as usual**” situation can be described as follows.

Climate and meteorological changes are already affecting the regional ecosystems, as demonstrated by significant losses in the size and distribution of Himalayan glaciers and reduced availability of water for irrigation, agriculture, hydropower and domestic use. Climate related threats, which will increase in the coming decades, demonstrate the clear need for strategic planning and regional adaptation practices notably in rural areas and for the agricultural sector, particularly vulnerable to climate change.

With about 69% of the population employed in the agricultural sector restrained in less than 3% of the country suitable for agriculture, with water sources drying, there is a need for efficient and sustainable natural resource management. Many adaptation strategies for the agricultural sector are constrained by a lack of information on locally-specific climate change impacts.

Local Government officials have basic general understanding of climate change but lack the knowledge of the significance of climate change adaptation and how it can be implemented. As mainstreaming climate change adaptation involves additional initial costs, the current mindset of the Local Governments in general is to not mainstream climate change adaptation and gender needs in local development investments ignoring the fact the long-term costs of not mainstreaming are higher. Without the AF support to strengthen the capacity of Local Governments for CCA governance, Local Governments will continue to plan and implement local development investments without mainstreaming CCA and gender aspects. This will result in wasteful and unsustainable local development investments.

There are number of national policies, legislations and plans related to water resources management that need to be implemented at the local level. A coordinated approach is required to implement them. Furthermore, standards and guidelines are in place for development and management of RWSS and irrigation systems. The capacity of Local Governments and communities need to be developed to employ these standards and guidelines effectively. Finally, localized water scarcities have led to water disputes between communities and individuals. These water disputes are often referred to central government agencies due to lack of capacity within the Local Government to resolve them.

Further to the benefits considered in section B (social, environmental, economic) and C (cost effectiveness), each component shows clear additionality.

**Component 1:** by addressing water issues from source to downstream users, the project ensures continuous availability of water resources. The approach is also expected to revive drying water sources and also protected water sources from degradation (business as usual case). As they regulate and filter water, wetland ecosystems need specific for ensuring continuous supply of quality water. The wetland inventory is expected to inform on the number and extent of wetlands that need protection within and outside the protected areas in Bhutan.

**Component 2:** Improving resilience of water related infrastructure is vital for delivering water from the source to the users. Component 2 will ensure delivery of water with required quality as a basic prerequisite for health, hygiene and human activity, including agriculture. Further, the proposed

technical solutions are justified by low labor requirements for maintenance, which is adapted to the situation in rural Bhutan where there is already shortage of farm labor.

**Component 3:** The proposed land management and informed agrometeorological services are essential to agricultural activities within the watershed area. Indeed, implementation of sustainable land management practices in vulnerable and degraded areas are critical for increasing resilience of agricultural sector. In addition, making climate change information easily accessible through user-friendly products and services are key for reducing vulnerability and breaking down the climate data in useable forms by the grassroots communities.

**Component 4:** water governance can be improved through the formation of the Water User Associations (WUA) with the goal of strengthening community-based initiatives and improve community preparedness for adapting to climate change. Integration of adaptation issues in the planning enhance resilience prospects for the future.

**Overall,** the project offers a holistic adaptation approach at District level, that include multi-stakeholder dialogue, focusing on improving the status of natural resources and thereby ensuring quality ecosystem services, allowing productive sectors to have the means for efficiency and resilience, and giving the opportunity for communities to engage in meaningful development planning processes.

**J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.**

The project activities are all aligned with 12th Five Year Developmental Plan of Bhutan (2018 to 2023) and in particular aligned with Royal Government of Bhutan's priority program, Water Flagship Program Access to 24x7 Safe Drinking Water with Irrigation. Thus, all proposed activities are mainstreamed with into the existing system.

Different government and local government agencies are responsible to manage the components. There are set of qualified and capable human resources to execute the task. The agencies have strong governance and financial systems and adequate due diligence will be exercised to conduct the overall management of the project/programme.

The project will use the following bases to ensure long-term sustainability of outcomes:

***RGoB commitment and ownership:*** The Royal Government of Bhutan (RGoB) through the Ministry of Agriculture & Forests (MoAF) has long recognized the importance of Sustainable Land Management (SLM) and Agriculture Land Development (ALD) to arrest the land degradation and improve land productivity. In line with this, ALD and SLM have been identified as one of the priority programmes in the 12<sup>th</sup> FYP (2018-2023) of the MoAF. Similarly, the MoAF has also recognized the importance of timely and user-friendly weather and climate information. Weather and climate information help farmers to make critical farm decisions such as planting time, what to plant, when to harvest, fertilizer and pesticide applications. Therefore, the Agrometeorology Program was established under the Department of Agriculture in 2019 to transform climate data into climate information in a way that responds to user needs and assists decision-making to reduce the impacts of climate-related hazards and increase benefits from favorable climatic conditions.

***Institutional sustainability:*** The project's institutional arrangements are based on existing RGoB institutional systems, program management, flow of funds, and accounting and reporting. In particular,

it will support RGoB's on-going efforts to strengthen capacity and organizational structures within the MoAF to systematically and effectively coordinate and better manage land degradation prevention activities and the generation of weather and climate information in Bhutan. In particular, the National Soil Services Centre (NSSC) and the Agrometeorology program within the Department of Agriculture are mandated to look after ALD and weather information respectively both during the project period and beyond.

***Participatory action planning and community ownership:*** The participatory village level action planning and implementation through farmers groups and community approach will stimulate ownership of the project interventions. Furthermore, the project investment in capacity development will ensure achievement of project results and the sustainability beyond the implementation period.

***Extension and technical support services:*** Extension and technical support services from the regional agriculture research and development centers (ARDCs) and the local governments (Dzongkhags & gewogs) are designed to promote responsiveness to the real needs and increased accountability to the farmer clients.

***Fiscal sustainability:*** The ALD and SLM activities are already mainstreamed into central and local government plans and programs. Every year, the RGoB allocates a certain budget (though limited) to ALD and SLM interventions. This ensures post-project sustainability as the government can take over project activities to scale up and replicate in other areas once the project phases out.

**K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.**

At the design stage of the proposed project, a preliminary E&S impacts and risks assessment was conducted in order to ensure that the project complies with the 15 principles of the AF's Environmental and Social Policy (ESP). The AF- ESP requires that projects comply and respect the laws, people's rights, gender equity, heritage, biodiversity and environment management. The assessments were done through a participatory approach engaging local officials, community representatives with at least one male and one female representative from each community from the project areas.

Each session started with an introduction about BTFEC and status of the proposed project, and overview of AF and BTFEC's ESS policies and need for participatory ESS risk assessment. Upon briefing on the project activities participants were asked to identify risks and impacts including vulnerable groups associated with the project activities by each category of AF ESS principles in smaller groups. Colour coded pieces of chart papers were used to collect the perspective of each small group. The risks, impacts and vulnerable groups identified by each small group were discussed at the plenary for contextual understanding and clarity.

Vulnerable and marginalized groups identified by these consultations are identified as households characterize by isolated and dotted settlements; communities without motorable access road; households with only elderly members & without households labour force; households with alcoholic heads; household with very few household members; Households with empty or no resident members; women and divorcee headed households. These vulnerable groups may not be able to actively participate in the project such as in consultations, community labour contribution to and other forms of participation and may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities.

The results of screening are presented in the table below.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		✓
Access and Equity	✓	
Marginalized and Vulnerable Groups		✓
Human Rights	✓	
Gender Equity and Women's Empowerment		✓
Indigenous Peoples	✓	
Core Labour Rights	✓	
Involuntary Resettlement	✓	
Protection of Forests and Natural Habitats		✓
Conservation of Biological Diversity		✓
Climate Change		✓
Pollution Prevention and Resource Efficiency		✓

Public Health		✓
Physical and Cultural Heritage		✓
Lands and Soil Conservation	✓	

Based on the environmental and social risks assessment, the stakeholders also discussed and identified related potential impacts as well as suitable mitigation measures mainly for the moderate risks. The risk screening did not point out any significant risk. These measures were identified according to the project activities and local situations as pointed out by the stakeholders. These mitigation measures for which costs have not been budgeted in the project activities have been budgeted in the ESMP.

The principles, which directly apply to the project but with moderate potential impacts that are manageable include;

*Principle on Compliance with the law:*

The project activities are in line with national regulations and laws.

Potential Risks: Moderate risks including risk of delay in project activities due to delay in obtaining permissions and clearances for project activities; risk of delay in project activities due to delay in obtaining consent to extract water from another local jurisdiction; Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers and minor degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations by project workers during project implementation phase.

Explanation: These were identified as potential but manageable risks by the consultations under outputs 2.1 and 2.2 and do not require EIA. The mitigation measures through monitoring of adherence to national laws and regulations are planned in the ESMP.

*Principle on Access and equity:*

Potential Risks: The project activities are in line with national regulations and laws and no potential risks and impacts were identified.

Explanation: These consultations identified no potential risks and impacts through the project activities.

*Principle on Marginalized and vulnerable groups:*

Potential Risks: Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES under output 1.2 and under

Vulnerable and marginalized groups may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities. Vulnerable and marginalized

groups and individuals may not be able contribute community labour contribution to the project under outputs 2.1 and 2.2

Explanation: The community consultations identified vulnerable and marginalized groups as households characterized by isolated and dotted settlements and without motorable access road; Those with only elderly members & without households labour force; households with alcoholic heads; those with less household members; Empty or no resident members; women and divorcee headed households. These potential risks if not managed may prevent the vulnerable and marginalized groups from accessing benefits of the project. However, they are manageable and mitigation measures are reflected in the ESMP.

#### *Principle on Human rights*

Potential Risks: The project activities are in line with national regulations and laws and no potential risks and impacts were identified.

Explanation: These consultations identified no potential risks and impacts through the project activities. The project activities are not discriminatory by tribe, age and gender or level of education. The project design relied on the consultative approach involving various stakeholders. No activities are identified whose execution is not in line with the established international human rights. Project objectives promote basic human rights for fair and equitable access to resources to enhance their resilience to climate change in the beneficiary countries.

#### *Principle on Gender equality and women's empowerment:*

The project activities are in line with national regulations and laws.

Potential Risks: Moderate risk resulting from activities under output 1.1, output 1.2 and output 1.3 include Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders; Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES initiatives and disruption of temporary access to water leading to health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure; Women will not have equal opportunities to participate and express their views on aspect of project implementation due to unequal participation in decision making forums and trainings under outputs 1.1, 1.2, 1.3, 2.4, 3.2, 3.3 and 4.1; Households characterized by women or divorcee headed or single parents may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities

Explanation: As reflected in the Gender Assessment and Action Plan, women face challenges that relate mainly to either unequal opportunities to participate in the project which is not managed could increase gender inequality. The community consultations have identified these risks to be manageable and mitigation measures proposed are included in the Gender Action Plan as well as in the ESMP.

#### *Principle on Core labour rights:*

Potential Risks: Safety risk associated with pump maintenance such and injury or workers in pump maintenance from through electric shock under output 2.3; Temporary labour from outside the project area may have conflicts with the local population and unhygienic accommodation and inadequate in labour camps for temporary labour from outside the project area may lead to health and safety of project workers under outputs 2.1 and 2.2



Explanation: The project will use labour to do unskilled construction tasks. These workers can also be people from outside the local community. Risks related to work safety and potential conflicts with local community are manageable and mitigation measures are included in the ESMP

*Principle on Indigenous people:*

Potential Risks: The project activities are in line with national regulations and laws and no potential risks and impacts were identified.

Explanation: The community consultations identified that the project areas do not have any community groups that are distinct and are uniquely different from any other community.

*Principle on Involuntary resettlement:*

Potential: The project activities are in line with national regulations and laws and no medium level potential risks and impacts were identified.

Explanation: The project activities will not lead to involuntary resettlement (in the sense of eviction or people involuntarily leaving their homes) or even losing their land use rights and will not include community resettlement activities. However, community consultations identified that minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land and on water distribution/allocation arrangements leading to delay in implementation of project activities. Mitigation measures are included in the ESMP.

*Principle on Protection of Natural Habitats:*

Potential Risks: Challenges in material transport across long distance may lead to construction of haphazard development of access roads and degradation of natural environment and landscape; Minor degradation of forest natural forests due to loss of vegetation through to land clearance during construction and establishment of camps for project activities; Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats; Unproportionate diversion of water from natural streams for drinking and irrigation water supply; Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures; Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations (under outputs 1.1;1.2,1.3, 2.1, 2.2, 2.3 and 3.2).

Explanation: Within the target area, there are no formal reserves/protected areas. However, in areas where there are not motorable roads minor clearing for enabling manual transportation of materials such as water pipes, establishment of temporary labour camps may create minor local disturbances to the natural landscapes in the project sites. The temporary presence of workers at the project sites could lead to collection of NWFPs and other natural products for their consumption. However, these risks and minor impacts are manageable and legal and regular norms are in place to manage such risks and mitigation measures included in the ESMP.

*Principle on Conservation of biological diversity:*

Potential risk: The project activities involving plantation activities to enrich water sources may risk introduction of Alien Invasive Species (AIS) due to imported planting materials and create minor disturbance to wildlife in the form of restricting access to water holes, under output 1.1 and1.3.

Explanation: The project will only utilize indigenous species, hereby mitigating any risk of species invasion. The project will not be exposed to any risks related to conservation and biodiversity and care will be taken to not endanger any flora and fauna habitats particularly the endangered species. The project will also, where required, create alternative water holes in the vicinity of water sources needed to create temporary protection of water points through fencing.

*Principle on Climate change:*

Potential Risks: Weak capacity for climate resilient design and management of water sources and infrastructure could lead to increased risk of climate disasters causing damage to project outputs and drinking water shortages in project areas as a result of temporal variation in water supply at source caused by climate change under outputs 2.1, 2.2 and 4.1.

Explanation: As the project is geared towards mainly adaptation interventions, the project components areas dedicated to strengthening climate resilience including project activities on awareness, knowledge and capacity building to adapt to climate change at community, district and national level. Specific training on climate resilient designs and management is included in the project. The project will create improved access to drinking and irrigation water enabling community resilience to climate change.

*Principle on Pollution prevention and resource efficiency:*

Potential Risk: The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure; Generation of waste from project activities and labour camps that can lead to pollution of local water bodies and natural environment; minor pollution of soils and surface water at project activity sites due to generation of solid and liquid wastes, especially during the rainy season; Disruption of temporary access to water may cause disruption in agriculture activities and reduced production due to diversion of water during construction and rehabilitation of irrigation water supply infrastructure; Long distance and terrain between water source and end user catchment may render water supply infrastructure inefficient due as a result of leakages, inadequate water volume and inappropriate water pressure. The consultations identified these minor risks and impacts under outputs 2.1; 2.2; 2.3; and 4.2.

Explanation: As indicated in the gender assessment report, most of the WUAs in the project area are not formally registered and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure. The localized waste from labour camps could cause minor pollution of soils and surface. Disruption of temporary access to water during construction may cause disruption in agriculture activities and reduced production due to diversion of water. Due to the long distance and terrain between water source and end user catchment, appropriate technical design needs to be incorporated to ensure that water supply infrastructure does not become inefficient. These elements are captured in the ESMP.

*Principle on Public Health:*

Potential Risks: The project activities include application of rainwater harvesting structures. Public health hazards through contamination of water through collection surfaces of rain water harvesting structures could be an issue. However, since these water harvesting structures will be micro structures their impacts are considered minimal. The use of workers from outside local communities could increase transmission of diseases within communities due to imported labour for project activities; Disruption of temporary access to water may cause health and sanitation issues to end

users due to rehabilitation or construction of drinking water supply infrastructure. These risks and impacts are identified under outputs 2.1, 2.2 and 2.3.

Explanation: Community consultations during the project's formulation emphasized that public health could be a serious problem if not managed and mitigated. However, as with the case of COVID-19 pandemic, they consider that these can be managed by compliance to health and safety practices and norms. These mitigation measures are included in the ESMP.

*Principle on Physical and cultural heritage:*

Potential Risk: Damage to physical & cultural heritage due to establishment of labour camps in culturally sensitive areas; Cultural and religious conflicts from non-compliance to local cultural norms during implementation of project activities by contractors or project workers as relevant under outputs 2.1, 2.2 and 2.3.

Explanation: The siting of project activities and labour camps must ensure mitigation of such risks and grievance mechanisms included in the ESMP to manage conflicts.

*Principle 15: Land and soil conservation:*

Potential Risks; Minor soil erosion and land degradation in project activity sites due to disturbance to topsoil created by machineries, trucks and construction materials under outputs 2.1, 2.2 and 2.3.

Explanation: In areas where there is road access, the project will engage machinery which could cause minor soil erosion and land degradation due to disturbance to topsoil created by machineries and trucks. Even where there is no machinery, the storage and collection of construction materials could trigger minor disturbance and contamination of soil by construction materials. However, these risks and impacts are minor and manageable and mitigation measures included in the ESMP. The inclusion of SLM activities in the project will enable adoption of new technologies for soil conservation.

The project ESMP is annexed.

## PART III: IMPLEMENTATION ARRANGEMENTS

### A. Describe the arrangements for project / programme implementation.

As the NDA, the Gross National Happiness Commission will provide strategic directions and oversee the overall achievement of the project outcomes.

The Bhutan Trust Fund for Environmental Conservation, as NIE, will provide overall coordination on the implementation of the Adaptation Fund Project and oversee the achievement of the project outputs.

The Project Steering Committee (PSC) under the umbrella of the NIE, will provide strategic technical and financial directions to the Project Management Unit and will be the decision-making body.

A Project Management Unit (PMU) housed at GNHC will coordinate with the Project Executing Entities for the smooth implementation of the project activities. The PMU will be responsible for the overall management of this Adaptation Fund Project.

The Project Executing Entities (one Entity for each of the four components) will execute the activities in collaboration with the local governments of the four dzongkhags. They will be responsible for the day-to-day execution of the project activities, their supervision and reporting.

The project beneficiaries (Four Dzongkhags) are at the local government level where the actual activities will be implemented. There will be active participation of the local government and community in the project implementation.

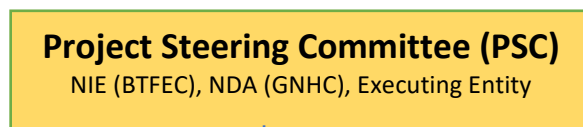
The responsible agencies for the components are the following:

Project Component	Executing Entity	Parent Organization
<b>Component 1</b> Adaptive management of watershed for enhancing resilience of community	Watershed Management Division	Department of Forest and Park Services, Ministry of Agriculture and Forests
<b>Component 2</b> Improve climate resilient water infrastructures for uninterrupted supply of	Agriculture Engineering Division	Department of Agriculture, Ministry of Agriculture and Forests
	Department of Engineering Services	Ministry of Works and Human Settlements
<b>Component 3</b>	National Soil Services	Department of Agriculture,

Strengthen climate-smart agriculture through sustained land management and informed agrometeorological services	Centre	Ministry of Agriculture and Forests
	Agrometeorology Program, Agriculture Research and Extension Division	Department of Agriculture, Ministry of Agriculture and Forests
<b>Component 4:</b> Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots	Department Local Governance	Ministry of Home and Cultural Affairs

Bhutan Trust Fund for Environmental Conservation (NIE) will sign an agreement with Gross National Happiness Commission on behalf of the executing entities. The agreement will include administrative, legal, technical and financial clauses.

### Project Organizational Structure



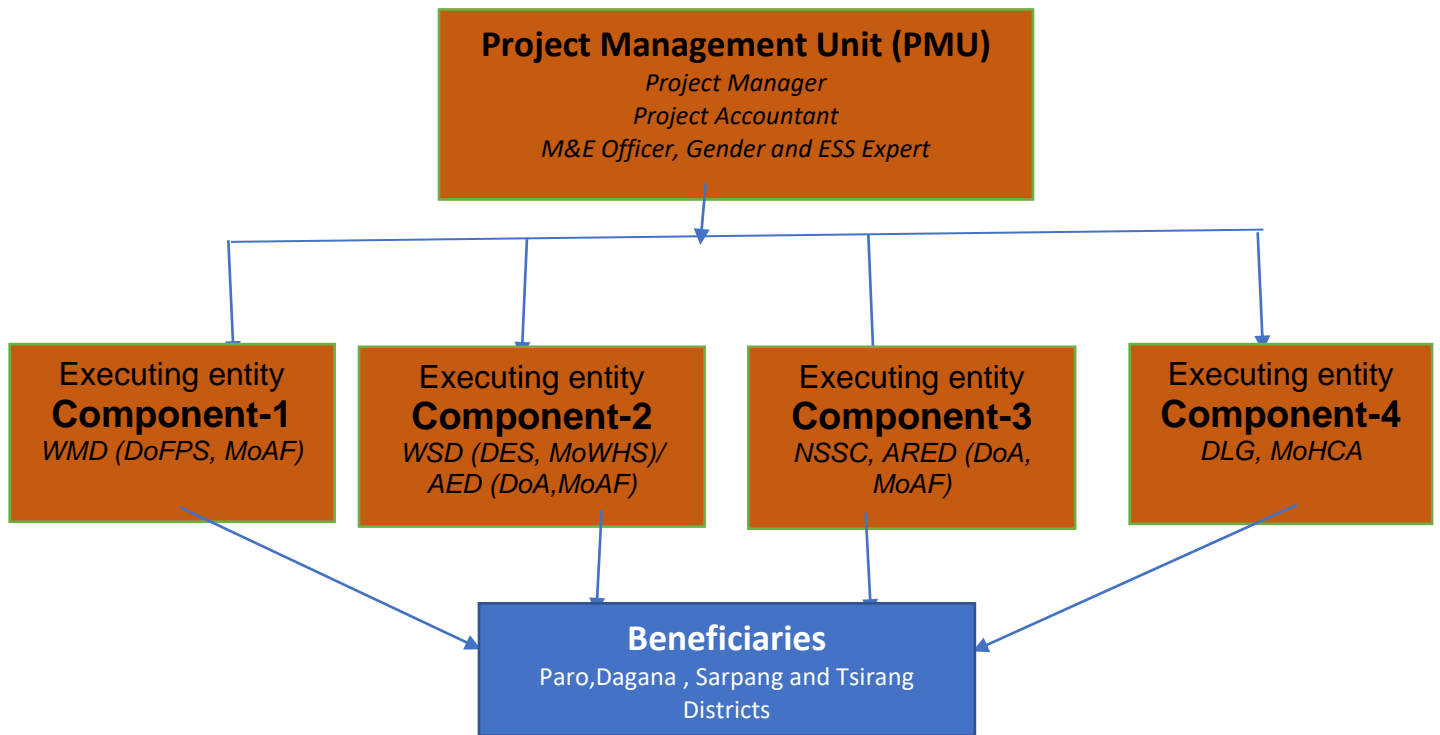


Figure 7: Project Organizational Structure

### *Roles and Responsibilities of Project Steering Committee*

A Project Steering Committee comprising memberships from the four Executing Entities, Designated Authority, beneficiaries and the NIE shall be established.

1. Supervise all aspects of project implementation and disbursement of funds to the executing entities
2. Review and approve project activities for each executing entity
3. Review project and project status reports with the aim of ensuring activities are implemented as planned and that they achieve expected outcomes
4. Provide guidance on the use of project resources and take measures that ensure cost effectiveness in Adaptation Fund
5. Liaise with the Royal Government of Bhutan on project implementation and provide policy guidance to the project related to the national policies in Adaptation Fund

### *Roles and Responsibilities of Project Management Unit*

The PMU's key functions will include but not be limited to:

1. Strategic planning, review, and coordination
2. Liaise with Executing Entities on the smooth implementation of activities
3. Monitor program performance and progress and use of funds
4. Consolidate technical and financial reports for submission to Adaptation Fund Secretariat
5. Provide technical support to Executing Entities
6. Knowledge management of Adaptation Fund project
7. Focal point for Adaptation Fund project

### *Roles and Responsibilities of Executing Entities*

1. Coordinate Adaptation Fund project activities within their respective project sites
2. Prepare progress reports as per Adaptation Fund report submit to NIE
3. Liaise with the NIE/PMU on projects implementation
4. Be role model for other regional Adaptation Fund projects by effectively implementing its specific project activities in effective ways
5. Ensure effective implementation of the project activities
6. Manage capital and mobilize human resources towards achievements of the concrete outputs per project

### *Roles and Responsibilities of Beneficiaries*

1. Provide feedback on the projects impacts
2. Where applicable provide human, physical and capital resources towards full implementation of the project
3. Full participation during project implementation
4. Disseminate information and create awareness on climate change adaptation and mitigation as per the implemented projects

### Financial Management:

All executing entities shall maintain their financial records in the Royal Government of Bhutan's (RGoB) accounting system- ePEMS. As such, all executing entities are government agencies and all financial records shall be maintained in the ePEMS accounting software following RGoB's Budget, Finance & Accounting Manuals 2016 with distinct Project Letter of Credit (PLC) or Financing Item Code (FIC). The executing entities shall submit their periodic financial reports to the NIE.

At the Implementing Entity level, the BTFEC maintains its all-financial records in a Sage ERP Complete and Comprehensive Program for Accounting Control (Sage ERP ACCPAC) accounting software and all accounting records shall be maintained in the same software. Financial reports to be submitted to the AF shall be data generated by this software.

### Fund Flow Mechanism:

Once the project is approved, based on the agreed disbursement schedule, the funds shall be transferred to the NIE's bank account maintained with Bhutan National Bank Limited, Thimphu Main Branch, via Royal Monetary Authority of Bhutan. Upon ensuring proper budget incorporation by respective implementing entities, the NIE shall disburse the fund to the Department of the Public Accounts (DPA), Ministry of Finance, Thimphu, Bhutan. The DPA, after fulfilling all the requirements, shall disburse the fund to the respective executing entities.

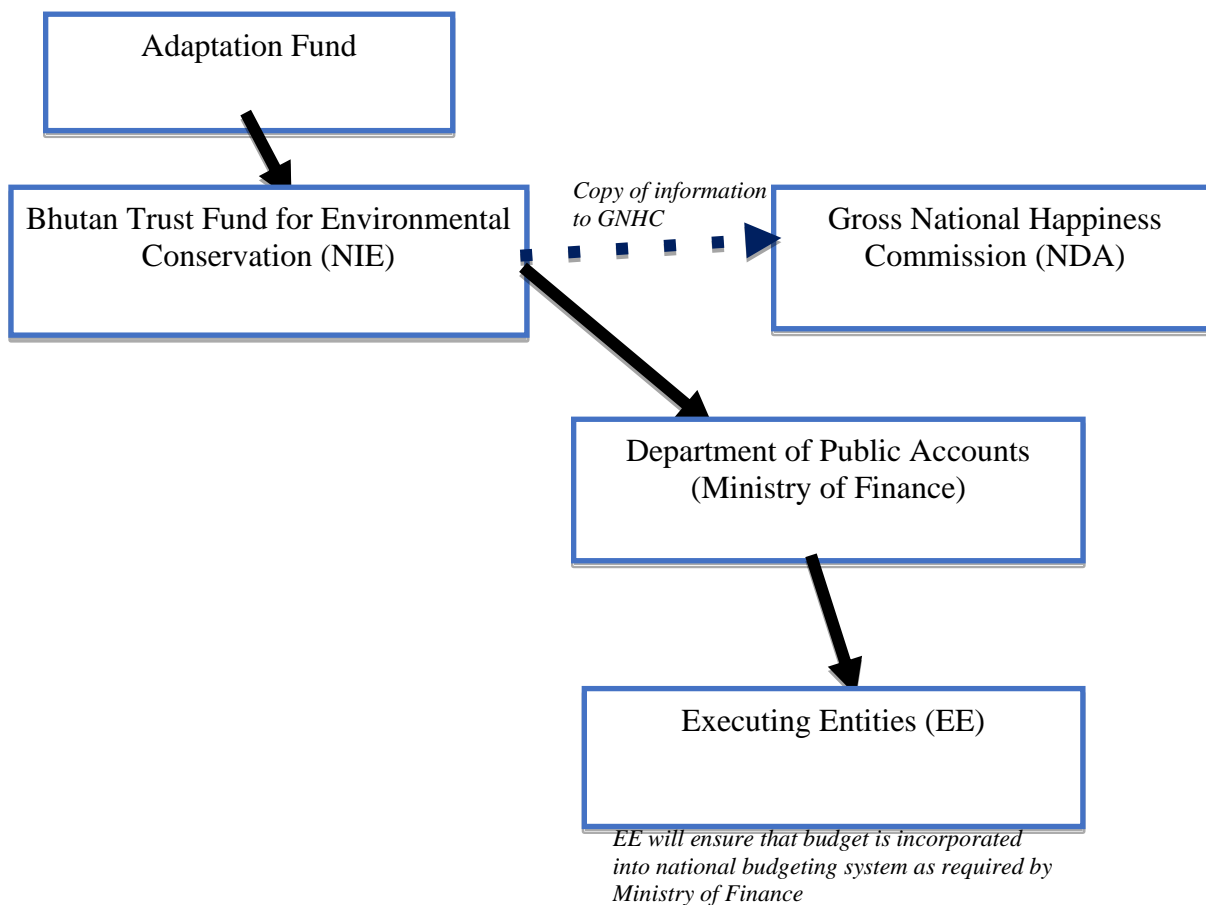




Figure 8: Flowchart Showing the Fund Flow

## Procurement management

In order to manage all procurement activities, the NIE will act as the procurement coordinator for the project. All procurement pertaining to the executing entities shall follow RGoB procurement rules and guidelines while the NIE shall follow its (BTSEC) procurement rules and guidelines.

The executing entities and the NIE shall prepare procurement plan for the entire project period. However, during the implementation, the entities shall plan procurement on an annual basis and shall report on quarterly basis.

All procurements will be executed as per the norms of the internationally recognized procedures.

## Periodic Progress Reporting:

The respective executing entities, using the NIE's prescribed reporting formats, shall submit periodic progress reports (both technical and financial) to the PMU. The PMU with endorsement from the NIE and NDA shall submit reports to the Adaptation Fund Secretariat. All reporting GNH Secretariat. The grant agreements to be signed between the RGoB (GNHC on behalf of executing entities) shall specify all terms and conditions fulfilling all reporting standards.

## Stakeholder engagement plans

### Component 1

Output	Stakeholder	Type	Role in Project
<b>Output 1.1</b> Watershed management plan implemented	Watershed Management Division	Government agency	Lead role in the facilitation and implementation of the activities foreseen for the output; coordination with various relevant agencies; technical guidance and backstopping.
	Department of Agriculture	Government Agency	Technical inputs and guidance for watershed management plan implementation.
	Department of Livestock	Government Agency	Technical inputs and guidance for watershed management plan implementation.
	Forestry Field Agencies (Territorial Divisions, Protected Areas)	Regional government agencies	Support in facilitation and implementation of the activities

	Dzongkhag and Gewog Administrations	Local government agencies	Mobilization of local participation. Coordination of implementation of field activities in the identified areas
	Local communities/pvt sector	Individual/local group	Participation and provide feedbacks, supplies of tools/machineries
<b>Output 1.2</b> Payments for Ecosystem Services schemes scaled-up	Watershed Management Division	Government agency	Lead role in the implementation of the activities foreseen for the output; PES sensitization of stakeholders; mediation between service providers and service beneficiaries; facilitation of PES process; guidance and coordination in development of PES agreements.
	Department of Agriculture	Government Agency	Technical inputs and guidance
	Department of Livestock	Government Agency	Technical inputs and guidance
	Dzongkhag and Gewog Administrations	local government agencies	Mobilization of local participation; local-level coordination and monitoring; local-level mediation, verifying activities implementation and facilitation of the PES process.
	Community Forest Management Group	Community group	Participate in the PES process, ecosystem service provider; and implementation of terms and conditions as per PES agreement.
	water users and water user's association	Individuals/Local community group	Participation in PES process; Monitoring and verification of PES activities, provides PES incentives
<b>Output 1.3</b> Water sources protected & recharge interventions adopted	Watershed Management Division	Government agency	Lead role in the facilitation and implementation of the activities foreseen for the output; coordination with

			various relevant agencies; technical guidance and backstopping.
	Department of Agriculture	Government Agency	Technical inputs and guidance
	Department of Livestock	Government Agency	Technical inputs and guidance
	Department of Geology and Mines	Government Agency	Technical inputs and guidance
	National Center for Hydrology and Meteorology	Government Agency	Technical inputs and guidance
	Forestry Field Agencies (Territorial Divisions, Protected Areas)	Regional government agencies	Support in facilitation and implementation of the activities
	Dzongkhag and Gewog Administrations	Local government agencies	Mobilization of local participation. Coordination of implementation of field activities in the identified areas
	Local communities/pvt sector	Individual/local group	Participation and provide feedbacks, supplies of tools/machineries
<b>Output 1.4</b> Wetland inventoried for informed decision making & its management	Watershed Management Division	Government agency	Lead role in the facilitation and implementation of the activities foreseen for the output; coordination with various relevant agencies; technical guidance and backstopping.
	Department of Agriculture	Government Agency	Technical inputs and guidance
	Department of Livestock	Government Agency	Technical inputs and guidance
	Forestry Field Agencies (Territorial Divisions, Protected Areas)	Regional government agencies	Support in facilitation and implementation of the activities
	Dzongkhag and Gewog Administrations	Local government agencies	Mobilization of local participation. Coordination of implementation of field activities in the identified

			areas
	Local communities/pvt sector	Individual/local group	Participation and provide feedbacks, supplies of tools/machineries

**Component 2: Improve climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation.**

Output	Stakeholder	Type	Role in Project
<b>Output 2.1:</b> Climate and disaster resilient drinking water infrastructure established	Water and Sanitation Division, Department of Engineering Services	Government agency	Lead role in the implementation of the activities foreseen for the output; coordination with various relevant agencies; technical guidance and backstopping.
	Local Government (Paro & Dagana)	Sub-national/ local government authorities	Implementation of field activities in the identified areas
	Local Community	Beneficiaries	Participation in effective operation, maintenance and management of completed schemes
<b>Output 2.2:</b> Climate and disaster resilient irrigation infrastructures established	Agriculture Engineering Division, Department of Agriculture	Government agency	Lead role in the implementation of the activities foreseen for the output; coordination with various relevant agencies; technical guidance and backstopping. Initiating survey, design and oversight & monitoring
	Agriculture Research Development Centres (ARDCs)	Regional Offices	Technical backstopping in survey & design, and oversight & monitoring
	Local Government (Paro & Dagana)	Sub-national/ local government authorities	Mobilization of local participation; local-level coordination and monitoring; survey, design and implementation of the irrigation schemes.
	Local community	Beneficiaries	Participation in effective operation, maintenance and management of completed schemes
<b>Output 2.3:</b> Innovative technologies for tapping water adopted	Water and Sanitation Division, Department of Engineering Services	Government agency	Lead role in the implementation of the activities foreseen for the output; coordination with various relevant agencies; technical guidance and backstopping.
	Agriculture Engineering	Government agency	Lead role in the implementation of the activities foreseen for the output;

	Division, Department of Agriculture		coordination with various relevant agencies; technical guidance and backstopping. Initiating survey, design and implementation of major irrigation schemes.
	Local Government (Paro & Dagana)	Sub-national/ local government authorities	Implementation of field activities in the identified areas
	Local Communities	Beneficiaries	Participation in effective operation, maintenance and management of completed schemes
<b>Output 2.4:</b> User groups in the community strengthened for effective management of irrigation and drinking water	Dzongkhag and Gewog Administrations	Sub-national/ local government authorities	Mobilization of local participation; local-level monitoring and backstopping; local-level mediation and facilitation of formation of WUAs.
	National Environment Commission	Central government agency	Policy and legislation-related guidance; legalization of WUAs
	Department of Agriculture, MoAF	Central government agency	Technical support, coordination and guidance in the formation of WUAs
	Department of Engineering Services, MoWHS	Central government agency	Technical support, coordination and guidance in the management of RWSS
	Local communities/user groups	Communities	Key beneficiaries; participation in WUAs; maintenance of RWSS and irrigation systems

**Component 3: Strengthen Climate Smart Agriculture through Sustainable Land Management and Agro-meteorology Service.**

<b>Output</b>	<b>Stakeholder</b>	<b>Type</b>	<b>Role in Project</b>
<b>Output 3.1:</b> SLM in vulnerable and degraded areas implemented	National Soil Services Centre, Department of Agriculture (DoA), Ministry of Agriculture & Forests (MoAF)	Government agency	Lead role in the implementation of the activities planned for the output; coordination with various relevant agencies; technical guidance and backstopping on SLM
	Central Machinery Unit, Department of Agriculture, MoAF	Government agency	Prepare machine deployment plan and mobilize machines to the Dzongkhags for agriculture land development; timely monitoring and maintenance of machines
	Farm Machinery Corporation Limited	State Owned Enterprise	Hiring of machineries for agriculture land development (terracing)
	Private machine hiring agencies	Private enterprise	Hiring of machineries for agriculture land development (terracing)
	Agriculture Research and Development Centres, DoA, MoAF	Regional government research agencies	Technical inputs and guidance for implementation of SLM plan
	National Seed Centre, DoA, MoAF	Government agency	Arrange to supply climate resilient seeds and seedlings; Support community-based seed production
	Private Nurseries	Private enterprise	Supply seeds and seedlings
	Local Governments (LG)	Local government authorities	Mobilization of local participation. Coordination of implementation of project activities in the identified areas
	Rural Communities	Beneficiary	Participation in actual implementation of project activities
<b>Output 3.2:</b> Climate change information, products and	Agriculture Research & Extension Division (ARED), DoA, MoAF	Government agency	Lead agency for planning, coordination and implementation of agro-met plans; Generation of agro-advisories; Coordinate and implement climate research in

services made available and accessible			agriculture using modeling and simulation tools; Be focal point for GIS and RS for the Department
	National Centre for Hydrology and Meteorology (NCHM)	Government agency	Prepare and provide weather forecasts (24x7) information. Monitoring of extreme weather events. Coordinate National Climate Outlook Forums (NCOF), National Framework for Climate Services and WMO Climate Services activities.
	Agriculture Research & Development Centres, DoA, MoAF	Regional government research agency	Liaise with ARED and NCHM in implementation of agro-met activities; Develop and validate crop calendar in the ADSS
	Central Programs (NSSC, NPPC), DoA, MoAF	Government agency	Liaise with ARED and NCHM in implementation of agro-met activities; Incorporate soil and plant protection data in the ADSS
	Local Governments	Local government authority	Facilitate Climate Field School; Validation of crop data; Communication of farm advisory to the users
	Rural Communities	Beneficiary	Participate in Climate Field School and actual use of climate and weather services
<b>Output 3.3:</b> Mainstreamed agricultural disaster risk reduction and management	Agriculture Research & Extension Division, DoA, MoAF	Government agency	Lead agency for planning, coordination and implementation of agro-met plans; Issuance of early warning system; Be the focal point for collection and management of crop damage data and come up with timely contingency plans
	Department of Disaster Management (DDM), MoHCA	Government agency	Lead agency for disaster risk reduction
	National Centre for Hydrology and Meteorology (NCHM)	Government agency	Prepare and provide weather forecast information; Integration of weather forecasting system in agriculture decision support system (ADSS); Provide seasonal outlook forum and early warning of extreme weather

			events
	Agriculture Research & Development Centres, DoA, MoAF	Regional government research agency	Liaise with ARED and NCHM in implementation of agro-met activities; Incorporate crop data in the ADSS
	Central Programs (NSSC, NPPC), DoA, MoAF	Government agency	Liaise with ARED and NCHM in implementation of agro-met activities; Incorporate soil and plant protection data in the ADSS
	Local Governments	Local government authority	Facilitate Climate Field School; Validation of crop data; Communication of farm advisory to the users
	Rural Communities	Beneficiary	Participate in Climate Field School and actual use of climate and weather services

**Component 4:** Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots.

Output	Stakeholder	Type	Role in Project
<b>Output 4.1:</b> Institutional mechanisms in Local Governments strengthened for CCA and gender mainstreaming	Department of Local Governance, MoHCA	Central government agency	Lead role in the implementation of the activities foreseen for the output; coordination with various relevant agencies; guidance and backstopping.
	Dzongkhag and Gewog Administrations	Sub-national/ local government authorities	Key beneficiaries; responsible for applying mainstreaming roles and responsibilities
	Central MRG/GNHC/NCWC	Inter-agency group/central government agency	Backstopping and guidance

**B. Describe the measures for financial and project / programme risk management.**

NIE has been an autonomous grant making agency of the Royal Government of Bhutan since 1996. NIE has also been an executing entity for GEF/World Bank funded projects, and other global financing organizations such as Climate Investment Fund, Green Climate Fund's readiness



grant, and so on. Thus, all financial and project management up to the international best practices as per the Program Operational Norms (PONs) of the NIE.

Basically, PONS lays out all required procedures of screening the project proposals against all operational and implementation risks including financial risks. For each of the risk identified during the project proposal development, a risk management plan will be developed including Environmental and Social Safeguards Management Plan.

Risk management is an essential element of good governance and an integral aspect of good management practice, and risk management is a shared responsibility. The NIE & EE are accountable for the overall implementation of the NIE's Risk Management Policy, and staff and managers are responsible for ensuring that risk management is integrated into all aspects of activities, including project design and implementation. The NIE's Risk Management Policy is designed to build institutional capacity for risk management that applies to project oversight and implementation.

Roles and responsibilities for financial and project risk management are outlined below.

**The National Implement Entity:**

- promotes the development of a culture that supports effective risk management and innovation, and that encourages effective risk taking in line with DOE's risk appetite;
- integrates risk management into Programs, Projects and functions so that it is a fundamental part of how the DOE works;
- ensures that risks are managed effectively, which includes identifying, analyzing, responding to, reviewing and reporting on risks;
- assigns accountability to staff for managing risks within their areas of responsibility, levels of authority and competence; and
- allows for the systematic review of risk management to ensure its effectiveness and adherence to DOE's risk appetite and project risk categorization.

**Governance and Audit Committee:** The Committee advises the Director and Management Team on the effectiveness of BT FEC's internal control systems, including risk management. Its terms of reference require it to ensure that the policy is working effectively and that risk is being properly managed. It also reviews internal and external audit reports, and provides advice on the independence, effectiveness and quality of BT FEC's internal audit functions.

**The Secretariat:** The Secretariat is responsible for ensuring that risks are managed effectively and reported. They are to ensure that responsibility is allocated for keeping risk registers up to date and for taking appropriate mitigation actions. They are responsible for ensuring that risks related to their office's objectives are identified, analyzed and appropriately addressed.

**Project Management Unit (PMU):** The PMU informs the NIE on risk and performance management, develops and updates Project and program risk management tools, coordinates risk management activities, facilitates the identification and evaluation of risks, and maintains NIE's risk management framework, ensuring that it is relevant and that it supports NIE's mandate.

**Internal Auditor:** The Internal Auditor provides assurance to management regarding the effectiveness of BT FEC's internal control systems, governance, risk management processes and on how well the BT FEC is meeting its objectives. It also contributes to the assessment of risk

management processes, the effectiveness of risk responses and the completeness and accuracy of risk reporting.

**External Audit:** The Royal Audit Authority (RAA) as the Supreme Audit Institution (SAI) of Bhutan is responsible to audit and report on the economy, efficiency and effectiveness in the use of public resources as per Article 25.1 of the Constitution of the Kingdom of Bhutan. Appointed by His Majesty the King on recommendation of the Prime Minister, the Chief Justice of Bhutan, the Speaker, the Chairperson of the National Council and the Leader of the Opposition Party, the Auditor General (AG) heads the Supreme Audit Institution for a period of five years or until attaining the age of sixty-five years, whichever is earlier.

The RAA, as an external audit independently assess the effectiveness of risk management and risk identification and control processes, including mitigation actions. Evaluations inform all stakeholders about the quality and effectiveness of policies, strategies and operations, and the efficiency of their implementation.

Financial and project risks and management measures are identified below. However, a risk may be handled, the actions must be documented and kept on file. This is done via the Risk Register.

Areas of Risk	BT FEC's operational area	Description of Risk	Severity			Risk Management Measure	Indicator
			L	M	H		
Strategic risks							
-Overall economic environment	Finance & Investment	Total assurance of the economic environment would still remain uncertain as the project intends to create resilience of communities through agricultural activities that are dependent on vagaries of climate and other allied natural phenomena.		X		Community commitment to carryout agriculture will be enhanced by assured water supply for agriculture and drinking ensuring their economic activities are facilitated	No of agreements signed with communities for their commitment for agriculture based economic activities
- Political	Governance	All the executing agencies are government agencies and proposed plans are aligned with the existing 5-year plan. Therefore, the project will have full political support.	X			Ensure good coordination with all stakeholders including central agencies	Meetings, communications to stakeholders
-Governance	Governance	Poor efficiency in implementation due to difficulties in decision making or to a lack of formal authority.	X			The execution of all four components are spear-headed by mandated government agencies with established	Reports

						institutional human resources and capacity.  Capacity building of the communities involved	
-Investments	Investment	Failure to respond to needs of the intended beneficiaries.	X			All project activities are need based and aligned with the 12 <sup>th</sup> FYP and thoroughly deliberated and planned.	FYP reports
- Corporate image	CRS	Shall the project receive a negative image, this would impact BTFEC reputation	X			The agreed methodology and participatory approach ensure project ownership from the partner entities and the final beneficiaries	
<b>Financial risks</b>							
-Financial sustainability	Financial	Effective availability and use of financial resources during implementation. Running costs of supported activities over time.	X			During implementation, the government will ensure financial sustainability through annual budget allocation for maintenance and other recurrent costs. Most expensive	

						items (notably, at irrigation level) are low maintenance. Users associations will be set in order to ensure local sustainability.	
- Cost escalations	Financial	Depending on inflation variation in the region, cost escalation could be foreseen, however, following the past trend of US\$ appreciating against BTN (national currency), forex gain could offset	X				
<b>Operational risks</b>							
- Procurement (goods/services)	Procurement	NIE and executing agencies have well established procurement norms adapted as part of the World Bank procurement processes, therefore, no risk is foreseen	X				
- Disbursements	Financial	Delays in disbursements	X			NIE and executing agencies have well established service delivery schedule and standards to ensure timely disbursement,	Semi-annual work plan and budget and monitoring reports

						therefore, no risk is foreseen	
-Communication	Communication	Lack of communication re: project activities and results	X			The NIE's communication with AF and as well with the project executing agencies can be well executed as the project will have a designated communication officer	Communication activities
-Planning and reporting (stakeholder consultation)	Program Management	Lack of accountability internal systems	X			The NIE has an established periodic planning and reporting schedule through a designated focal person for each component. Further, the project has established stakeholder engagement plan defining specific roles and responsibilities of all stakeholders	Reports
<b>Organizational</b>							

-Technical capacity	Program management	All agencies involved have adequate and qualified human resources. Certain specific technical capacity may be required for enhancement of knowledge and skills for enhancement of project implementation	X			Capacity building programs will be put in place as part of the project, to reinforce specific aspects in terms of capacity.	
-Information Technology	Knowledge management	Lack of capacity related to poor IT systems	X			Both at NIE and Executing levels, the information technology facilities are well established	
-Legal identity	Administrative	Lack of determination of individuals, companies or government entities that participate in the Project may lead to impediments during implementation (e.g., delays in payments)	X			The NIE was established under the Royal Charter. The government as the executing agency, the project already has the legal identity and no issue is foreseen. All projects' stakeholders need to demonstrate they operate under a recognized legal entity.	

Table 6: Initial draft for risk management matrix

**C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund.**

The project is screened through NIE's Environment Social Safeguards (ESS) and Gender Screening tools which screens project in relation to all of the following ESS and Gender Standards:

1. Compliance with law
2. Access and equity
3. Marginalized and vulnerable group
4. Human rights
5. Gender equality and women empowerment
6. Core labor rights
7. Indigenous people
8. Involuntary resettlement
9. Protection of forests and natural habitats
10. Conservation of biological diversity
11. Climate change
12. Pollution prevention and resource efficiency
13. Public health
14. Physical and cultural resources/heritage
15. Land and soil conservation

Those standards were in line with the best practices of ESS guidelines of Adaptation Fund. Further the NIE has a Gender Equality Strategy Framework, which is already being implemented since 2016.

During the project design stakeholder consultations were held at community locations to consult and assess ESS and gender considerations. Participants at the session stakeholder consultation ESS and gender included the Dzongkhag Planning Officer, Dzongkhag engineer, environment officer, Dzongkhag gender focal person, Dzongkhag Agriculture officer, the Gups of concerned gewogs, Mangmis, and additional male and female representatives of each gewog. These consultations were held at locations that are easily reachable by local communities as identified by local officials.

Each session started with an introduction about BTFEC and status of the proposed project, and overview of AF and BTFEC's ESS policies and need for participatory ESS risk assessment. Upon briefing on the project activities participants were asked to identify risks and impacts including vulnerable groups associated with the project activities by each category of AF ESS principles in smaller groups. Colour coded pieces of chart papers were used to collect the perspective of each small group. The risks, impacts and vulnerable groups identified by each small group were discussed at the plenary for contextual understanding and clarity.

Vulnerable and marginalized groups identified by these consultations are identified as households characterized by isolated and dotted settlements; communities without motorable access road; households with only elderly members & without households labour force; households with alcoholic heads; household with very few household members; Households with empty or no resident members; women and divorcee headed households. These vulnerable groups may not be able to actively participate in the project such as in consultations, community labour contribution to and other forms of participation and may not be included as



project beneficiaries if the project considers communities to provide unskilled labour for project activities.

The risks and impacts identified by the stakeholder consultations are described in table C1.

The project has been screened using the ESS screening tool (See Table on Environmental and social risks screening of the project by AF and BTFEC principles) which is based on a list of risks identified against each project activity (Table on Description of project activities and identifying Environmental and Social Risks).

Description of project activities and identifying Environmental and Social Risks

<b>Outputs</b>	<b>Activities</b>	<b>Risks</b>	<b>Impacts</b>
Output 1.1 Watershed management intervention measures implemented	Activity 1.1.1 Conduct community consultations and sensitizations	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 1.1.2 Training Workshops	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Project activities may be delayed
	Activity 1.1.3 Conduct detailed watershed assessments in the project dzongkhags	No risks foreseen	
	Activity 1.1.4 Development of watershed management intervention measures for the prioritized areas	No risks foreseen	
	Activity 1.1.5 Implementation of identified intervention measures	Grievance related to lack of awareness on project intervention measures	Lack of project ownership by local stakeholders
		Restrictions may be imposed on some grazing areas that fall in water catchment protection interventions	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources

		Risk of spreading pests and diseases due imported labor and planting materials for the identified interventions	Spread of pests and diseases among local communities and local vegetation
		Introduction of Alien Invasive Species (AIS) and spread of pest and diseases due to imported planting materials for watershed restoration interventions	Spread of pests and diseases within local vegetation and loss of biodiversity
		Impact on wildlife in the form or restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
Output 1.2 Payments-for-Ecosystem Services (PES) schemes scaled-up	Activity 1.2.1 Conduct community consultations and sensitizations in each gewog	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 1.2.2 Hands-on training workshops in the implementation and management of PES schemes	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Project activities may be delayed
	Activity 1.2.3 Conduct detailed resource assessment and inventory in each Dzongkhag	No risks foreseen	
	Activity 1.2.4 PES scheme development and implementation based on feasibility	Lack of inclusive community participation in PES scheme development	Unequal benefits from PES
		Restrictions may be imposed on some grazing areas that fall in water catchment protection	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources

		Risk of spreading pests and diseases due imported labor and planting materials	Spread of pests and diseases among local communities and local vegetation
		Introduction of Alien Invasive Species (AIS) and spread of pest and diseases due to imported planting materials for watershed restoration	Spread of pests and diseases within local vegetation and loss of biodiversity
		Impact on wild life in the form or restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place
Output 1.3 Water sources' recharge interventions adopted	Activity 1.3.1 Conduct community consultations and sensitizations in each gewog	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 1.3.2 Training Workshops	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Project activities may be delayed
	Activity 1.3.3: Conduct field works	No risks foreseen	
	Activity 1.3.4: Planning of intervention measures for the prioritized areas	No risks foreseen	
	Activity 1.3.5 implementations of intervention action plan activities	Lack of awareness on project activities and plans	Weak project ownership by local stakeholders

		Restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		Restrictions may be imposed on some grazing areas that fall in water catchment protection	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources
		Introduction of Alien Invasive Species (AIS) Due to imported planting materials for watershed restoration	Spread of pests and diseases within local vegetation and loss of biodiversity
	Activity 1.3.6: Monitoring and maintenance of conservation/restoration activities	No risks foreseen	
Output 1.4 Wetland monitoring system established for informed decision-making established	Activity 1.4.1 Training Workshops or capacity building of field offices	Pandemic norms may restrict gathering for training sessions	Project activities may be delayed
	Activity 1.4.2 Conduct mapping of wetlands for the project Dzongkhags using remote sensing	No risks foreseen	
	Activity 1.4.3 Field data collection and mapping in all project gewogs	No risks foreseen	
	Activity 1.4.4 Data compilation and analysis feeding decision making mechanisms	No risks foreseen	
Output 2.1: Climate- and disaster-resilient drinking water infrastructure	Activity 2.1.1. Construction and Rehabilitation of Drinking Water at least 6 Supply Schemes	Disturbance to topsoil created by machineries and trucks	Minor soil erosion and land degradation in project activity sites

established			
		Generation of solid and liquid wastes from project activities at construction sites	Minor pollution especially during the rainy season.
		End water suffer temporary disruption on drinking water supply a result of construction and rehabilitation works and temporally diversion of water supply	Temporary disruption in water supply causing health and sanitation issues
		Impact on wild life in the form or restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		Risk of non-compliance to labor laws during implementation of project activities by contractors or project workers	Conflict with regulations
		Risk of non-compliance to nature conservation regulations during implementation of project activities by contractors or project workers	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife
		Risk of non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Conflict with regulations and local cultural norms  Cultural and religious conflicts among project workers and local communities
		Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land; on water distribution arrangements	Delay in implementation of project activities
		Vulnerable and marginalized groups and individuals (households	Vulnerable and marginalized groups may not be included

		characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without household labor force; with alcoholic heads; fewer household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labor contribution to the project	as project beneficiaries
		Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labor contribution to the project	Poor community members may not be included as project beneficiaries
		Unhygienic accommodation and inadequate accommodation in labor camps for temporary labor from outside the project area may lead to health and safety of project workers	Impact on health and safety of project workers
		Increased waste from project activities and labor camps	Pollution of local water bodies and natural environment
		Risk of spreading pests and diseases within communities due to imported labor for project activities	Spreading of pests and diseases within communities
		Loss of vegetation due to land clearance during construction and establishment of camps for project activities	Minor degradation of forest natural forests
		Establishment of labor camps in culturally sensitive areas	Damage to physical cultural heritage
		alignment along rugged terrain over long distances	Infrastructure may be rendered inefficient and vulnerable to disasters due to leakages, inadequate water volume and inappropriate water

			pressure
		increased waste from project activities and labor camps	Pollution of local water bodies and natural environment
		Unproportionate diversion of water from natural streams for drinking and irrigation water supply	Water bodies may dry up Integrity of watersheds may be compromised
		Soil erosion from construction activities	Land degradation
		Challenge in availing consent for use of water sources or raw materials from another gewog	Delay of project activities
		Challenges in material transport across long distance may lead to construction of haphazard development of access roads	Degradation of natural environment and landscape
		Delay in permits and clearances for project work	Delay of project activities
		Temporal variation in water supply at source due to climate change	Drinking water shortages
	Activity 2.1.2. Dev of Water Inventory	No risks foreseen	
	Activity 2.1.3. Capacity Building of Engineers in Climate Resilient Water Supply Infrastructures	No risks foreseen	
Output 2.2: Climate and disaster resilient irrigation infrastructure established	Activity 2.2.1. Construction of at least 2 pressurized/closed irrigation systems (gravity)	Disturbance to topsoil created by machineries and trucks	Minor soil erosion and land degradation in project activity sites
		Generation of solid and liquid wastes from project activities at construction sites	Minor pollution especially during the rainy season.

		End users may face temporary disruption on irrigation water supply a result of construction works and temporally shortage diversions	Temporary disruption in water supply causing disruption to agriculture activities
		Risk of non-compliance to labor laws during implementation of project activities by contractors or project workers	Conflict with regulations
		Risk of non-compliance to nature conservation regulations during implementation of project activities by contractors or project workers	Degradation of natural environment and landscape
		Risk of non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Conflict with regulations and local cultural norms  Cultural and religious conflicts among project workers and local communities
		Impact on wild life in the form or restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land; on water distribution arrangements	Delay in implementation of project activities
		Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without household labor force; with alcoholic heads; fewer household members; Empty or no resident members; women and divorcee	Vulnerable and marginalized groups may not be included as project beneficiaries



		headed) may not be able contribute community labor contribution to the project	
		Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labor contribution to the project	Poor community members may not be included as project beneficiaries
		Restrictions may be imposed on some grazing areas that fall in water catchment protection	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources
		Unhygienic accommodation and inadequate accommodation in labor camps for temporary labor from outside the project areas	Impact on health and safety of project workers
		Unhygienic accommodation and inadequate accommodation in labor camps for temporary labor from outside the project area may lead to health and safety of project workers	Impact on health and safety of project workers
		Increased waste from project activities and labor camps	Pollution of local water bodies and natural environment
		Limited loss of vegetation due to land clearance during construction and establishment of camps for project activities	Minor degradation of forest natural forests
		Establishment of labor camps in culturally sensitive areas	Damage to physical cultural heritage
		alignment along rugged terrain over long distances	Infrastructure may be rendered inefficient and vulnerable to disasters due to leakages, inadequate water volume and

			inappropriate water pressure
		Unproportionate diversion of water from natural streams for drinking and irrigation water supply	Water bodies may dry up Integrity of watersheds may be compromised
		Soil erosion from construction activities	Land degradation
		Challenge in availing consent for use of water sources or raw materials from another gewog	Delay of project activities
		Challenges in material transport across long distance may lead to construction of haphazard development of access roads	Degradation of natural environment and landscape
		Delay in permits and clearances for project work	Delay of project activities
		Temporal variation in water supply at source due to climate change	Drinking water shortages
		Risk of spreading pests and diseases within communities due to imported labor for project activities	Spreading of pests and diseases within communities
	Activity 2.2.2. Re-engineering/ rehabilitation or improvement of 4 existing irrigation systems	Risk of spreading pests and diseases within communities due to imported labor for project activities	Spreading of pests and diseases within communities
		End users may face temporary disruption on irrigation water supply a result of construction works and temporally shortage diversions	Temporary disruption in water supply causing disruption to agriculture activities
		Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land; on water	Delay in implementation of project activities

		distribution arrangements	
		Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without household labor force; with alcoholic heads; fewer household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labor contribution to the project	Vulnerable and marginalized groups may not be included as project beneficiaries
		Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labor contribution to the project	Poor community members may not be included as project beneficiaries
		Risk of non-compliance to labor laws during implementation of project activities by contractors or project workers	Conflict with regulations
		Risk of non-compliance to nature conservation regulations during implementation of project activities by contractors or project workers	Degradation of natural environment and landscape
		Risk of non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Conflict with regulations and local cultural norms  Cultural and religious conflicts among project workers and local communities

		Unhygienic and inadequate accommodation in labor camps for temporary labor from outside the project area may lead to health and safety of project workers	Impact on health and safety of project workers
		Increased waste from project activities and labor camps	Pollution of local water bodies and natural environment
		Risk of spreading pests and diseases within communities due to imported labor for project activities	Spreading of pests and diseases within communities
		Limited loss of vegetation due to land clearance during construction and establishment of camps for project activities	Minor degradation of forest natural forests
		Establishment of labor camps in culturally sensitive areas	Damage to physical cultural heritage
	Activity 2.2.3. Scale up micro-irrigation system (drip & sprinkler)	No risks foreseen	
	Activity 2.2.4. Tail water management	No risks foreseen	
Output 2.3: Innovative technologies for tapping water adopted	Activity 2.3.1. Promote and scale up solar/electric/manual water pump for irrigation (pumping from rivers, groundwater)	Excessive ground water abstraction may cause drop on water table during operation and management phases	Decrease in ground water table and disturbance to hydrologic cycle
		safety risk associated with pump maintenance	Injury to workers in pump maintenance such as through electric shock
		Risk of spreading pests and diseases within communities due to imported labor for project activities	Spreading of pests and diseases within communities
	Activity 2.3.2. Build water harvesting structures or small-scale reservoirs to tap water for irrigation	Contamination water through collection surfaces	Health hazards

		Risk of spreading pests and diseases within communities due to imported labor for project activities	Spreading of pests and diseases within communities
Output 2.4: User groups in the community strengthened for effective management of irrigation and drinking water	Activity 2.4.1: Form and strengthen user groups in the community to promote local ownership and sustainability of rural drinking water	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure	Unsustainable management of water resources and infrastructure
		COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place  Project activities may be delayed
		Weak capacity for climate resilient design and management of water sources and infrastructure	Increased risk of climate disasters causing damage to project output
	Activity 2.4.2: Form and strengthen user groups in the community to promote local ownership and sustainability of irrigation schemes	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure	Unsustainable management of water resources and infrastructure
		COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place  Project activities may be delayed
		Weak capacity for climate resilient design and management of water sources and infrastructure	Increased risk of climate disasters causing damage to project output
<b>Output 3.1</b> SLM in vulnerable and degraded areas implemented	Activity 3.1.1 Participatory SLM action planning to validate SLM interventions	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place

	Activity 3.1.2 Implementation of SLM measures – terracing (1000 Acres), contour hedgerows (500 Acres) and landslide stabilization measures (20 Acres);	No risks foreseen	
	Activity 3.1.3: Technical assistance and support to communities on the implementation of SLM practices in the field (12 Nos)	No risks foreseen	
	Activity 3.1.4: Field- based and specialized training to farmers and agriculture extension staff on SLM technologies to enable them to respond to climate change induced risks and impacts with more competence and knowledge (300 Farmers);	No risks foreseen	
	Activity 3.1.5: Learning visits for extension officers on SLM & Climate Change (12 staff)	No risks foreseen	
	Activity 3.1.6: Monitoring and technical assistance to support communities in implementation of SLM and to see the work progress (12 Nos)	No risks foreseen	
	Activity 3.1.7: Documentation, Knowledge Management (KM) and experience	No risks foreseen	

	sharing platforms (3 Nos of workshops)		
<b>Output 3.2:</b> Climate change information, products and services made available and accessible	Activity 3.2.1: Agro- met advisory bulletins appropriately packaged and disseminated timely	No risks foreseen	
	Activity 3.2.2: Incorporation of area specific weather and crop data in ADSS	No risks foreseen	
	Activity 3.2.3: Capacity building of agro-met focal points based in ARDCs and Central Programs	No risks foreseen	
	Activity 3.2.4: Knowledge management and communication activities	No risks foreseen	
<b>Output 3.3</b> Agricultural disaster risk reduction and management mainstreamed	Activity 3.3.1 Initiation of Climate/ Field Schools to bring transformational change by enhancing response capacity to identified risks	No risks foreseen	
	Activity 3.3.2 Sensitization, awareness and capacity dev on agro- met services to researchers, extension and farmers	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 3.3.3 Development of crop suitability and feasibility maps	No risks foreseen	

Output 4.1: Institutional mechanisms in Local Governments strengthened for CCA and gender mainstreaming	Activity 4.1.1: Conduct sensitization workshop for LGs and communities on mainstreaming CCA and gender in local development plans, programs and activities related to drinking water, irrigation and SLM	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 4.1.2: Conduct capacity development training for LGs on CCA investment and mainstreaming tools, frameworks and approaches;	COVID-19 pandemic protocols may travel activities	Project activities may be delayed
	Activity 4.1.3: Carry out M&E of CCA and gender mainstreaming in their plans, programs and activities	No risks foreseen	

Environmental and social risks screening of the project by AF and BTFEC principles

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
1	COMPLIANCE WITH THE LAW				
1.1	Risk of delay in project activities due to delay in obtaining permissions and clearances for project activities	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1)	M	L	M
1.2	Risk of delay in project activities due to delay in obtaining consent to extract water from another local jurisdiction	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1)	M	M	M
1.3	Risk of delay because of need for compliance with COVID - 19 pandemic norms	Community consultations and sensitizations, Trainings and planning workshops (Activities 1.1.2; 1.2.2; 1.3.2; 4.1.2)	M	L	M



1.4	Risk of non-compliance to labor laws during implementation of project activities by contractors or project workers	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
1.5	Will there be risk that project does not comply with pollution control laws	None			
1.6	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
	<b>OVERALL RATING ON COMPLIANCE WITH THE LAW</b>		M	M	M
2	ACCESS AND EQUITY				
2.1	Poor people will not have equal opportunities to be selected as project beneficiaries	None			
2.2	Women will not have equal opportunities to be selected as project beneficiaries	None			
2.3	Indigenous minority people will not have equal opportunities to be selected as project beneficiaries	None			
2.4	Poor people will not be able to access services supported by the project	None			
2.5	Women will not be able to access services supported by the project	None			
2.6	Indigenous minority people will not be able to access services supported by the project	None			
2.7	Disabled people will not be able to access services supported by the project	None			
2.8	Elderly people will not be able to access services supported by the project	None			
2.9	Buildings constructed by the project will not have access	None			

	for disabled people				
2.10	COVID-19 pandemic protocols may restrict inclusive community consultations and participation; Risk of ownership over project activities	Community consultations and sensitizations, Trainings and planning workshops (Activities 1.1.1; 1.2.1; 1.2.4; 1.3.1; 2.4.1; 2.4.2; 3.1.1;3.3.2;4.1.1)	M	M	M
2.11	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES	PES scheme development and implementation (Activity 1.2.4)	M	M	M
2.12	Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders	Community consultations and sensitizations, Trainings and planning workshops (Activities 1.1.5; 1.3.5)			
2.13	Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure	Construction activities for drinking water supply and rehabilitation works (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON ACCESS AND EQUITY</b>		<b>M</b>	<b>M</b>	<b>M</b>
3	<b>MARGINALIZED &amp; VULNERABLE GROUPS</b>				
3.1	Elderly people will experience negative impacts from the project	None			
3.2	Disabled people will experience negative impacts from the project	None			
3.3	Refugees or displaced people will experience negative impacts from the project	None			
3.4	Migrant workers will experience negative impacts from the project	None			
3.5	Children will experience negative impacts from the project	None			
3.6	Lack of inclusive community participation in PES scheme development leading to	PES scheme development and implementation	M	M	M

	unequal benefits from PES	(Activity 1.2.4)			
3.7	Vulnerable and marginalized groups may not be included as project beneficiaries if the project considers communities to provide unskilled labor for project activities. Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without household labor force; with alcoholic heads; fewer household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labor contribution to the project	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON MARGINALIZED &amp; VULNERABLE GROUPS</b>		<b>M</b>	<b>M</b>	<b>M</b>
4	<b>HUMAN RIGHTS</b>				
4.1	Implementation of the project will result in violation of human rights of any people?	None			
	<b>OVERALL RATING HUMAN RIGHTS</b>	<b>None</b>			
5	<b>GENDER EQUALITY &amp; WOMEN'S EMPOWERMENT</b>				
5.1	The project is designed by men who have not taken women's perspectives into consideration	None			
5.2	The project will result in an increased workload of tasks traditionally done by women	None			
5.3	Women will not have equal opportunities to participate and express their views on aspect of project implementation	Community consultations and sensitizations, Trainings and planning workshops (Activities 1.1.1; 1.1.2; 1.2.1;	M	M	M

		1.3.1;1.3.2; 2.4.1; 3.3.2; 4.1.1; 4.1.2)			
5.4	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES	PES scheme development and implementation (Activity 1.2.4)	M	M	M
5.5	Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders	Community consultations and sensitizations, Trainings and planning workshops (Activities 1.1.5; 1.3.5)			
5.6	Households characterized by women or divorcee headed or single parents may not be included as project beneficiaries if the project considers communities to provide unskilled labor for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON GENDER EQUALITY &amp; WOMEN'S EMPOWERMENT</b>		<b>M</b>	<b>M</b>	<b>M</b>
6	CORE LABOUR RIGHTS				
6.1	Women or vulnerable groups will not have equal opportunities for employment in project activities	None			
6.2	The project will employ local people in conditions that may not comply with labor laws	None			
6.3	Safety risk associated with pump maintenance such and injury or workers in pump maintenance from through electric shock	Ground water extractions (Activity 2.3.1)	L	L	L
6.4	Unhygienic accommodation and inadequate in labor camps for temporary labor from outside the project area may lead to health and safety of project workers	Construction and Rehabilitation of Drinking Water Schemes/ pressurized/closed irrigation systems/			

		(gravity)/ Re-engineering/ rehabilitation or improvement (Activity 2.1.1; 2.2.1;2.2.2)			
6.5	Temporary labor from outside the project area will have conflicts with the local population	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.2)	M	M	M
6.6	Temporary labor from outside the project area will create a risk of spreading HIV or other transmissible diseases	None			
6.7	Children could be employed in project activities in contravention of the labor laws	None			
	<b>OVERALL RATING ON CORE LABOUR RIGHTS</b>		<b>M</b>	<b>M</b>	<b>M</b>
7	<b>INDIGENOUS PEOPLES</b>				
7.1	Indigenous people will not be adequately consulted about the project	None			
7.2	Indigenous people will experience negative impacts on their traditional livelihoods	None			
7.3	Indigenous people will lose access to land or natural resources	None			
7.4	Indigenous people will experience negative impacts on their traditional culture and way of life	None			
7.5	People who are not indigenous minority will come to live, work or visit indigenous community areas.	None			
	<b>OVERALL RATING ON INDIGENOUS PEOPLES</b>	<b>None</b>			
8	<b>INVOLUNTARY RESETTLEMENT</b>				
8.1	Some households will have reduced incomes because of loss of land	None			

8.2	Households will suffer negative impacts from having to move their homes	None			
8.3	Households will have reduced income because of loss of access to community land or common property resources	None			
8.4	Land acquisition will be carried out without adequate consultation with the land users	None			
8.5	Land users will have the right to compensation but there will be no funds to pay compensation	None			
8.6	Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land and on water distribution/allocation arrangements leading to delay in implementation of project activities	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1; 2.2.2)	L	L	L
	<b>OVERALL RATING ON INVOLUNTARY RESETTLEMENT</b>		L	L	L
9	<b>PROTECTION OF FORESTS &amp; NATURAL HABITATS</b>				
9.1	Challenges in material transport across long distance may lead to construction of haphazard development of access roads and degradation of natural environment and landscape	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1)	M	L	M
9.2	Minor degradation of forest natural forests due to loss of vegetation through to land clearance during construction and establishment of camps for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	L	L
9.2	Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats	Implementation of watershed management and water source recharge	L	M	M

		activities (Activities 1.1.5;1.2.4; 1.3.5; 2.1.1;2.2.2)			
9.3	Unproportionate diversion of water from natural streams for drinking and irrigation water supply	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
9.4	Project will result in increased hunting of protected species of wildlife	None			
9.5	Project will result in unsustainable increase in wild capture fishing	None			
9.6	Project will result in unsustainable increase in firewood collection or timber cutting	None			
9.7	Project will result in unsustainable increase in collection of non-timber forest products	None			
9.8	Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures	Watershed management, PES and water source recharge activities (Activities 1.1.5; 1.2.4; 1.3.5; 2.2.1)	M	L	M
9.9	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	L	M
	<b>OVERALL RATING ON PROTECTION OF FORESTS &amp; NATURAL HABITATS</b>		<b>M</b>	<b>M</b>	<b>M</b>
10	<b>CONSERVATION OF BIOLOGICAL DIVERSITY</b>				
10.1	Project will damage areas that are important for biodiversity	None			
10.2	Changed farming practices will reduce biodiversity	None			

10.3	Project will result in drainage of wetlands or natural water bodies	None			
10.4	Introduction of Alien Invasive Species (AIS) due to imported planting materials for watershed restoration	Implementation of watershed management and water source recharge activities (Activities 1.1.5; 1.2.4;1.3.5)	M	L	M
10.5	Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats	Implementation of watershed management and water source recharge activities (Activities 1.1.5;1.3.4)	L	M	M
	<b>OVERALL RATING ON CONSERVATION OF BIOLOGICAL DIVERSITY</b>		<b>M</b>	<b>M</b>	<b>M</b>
11	<b>CLIMATE CHANGE</b>				
11.1	The project supports activities that will not be sustainable because of climate change	None			
11.2	Weak capacity for climate resilient design and management of water sources and infrastructure could lead to increased risk of climate disasters causing damage to project output	Conducting capacity building for LGs on CCA tools, frameworks and approaches (Activity 2.4.1;2.4.2)	M	M	M
11.3	Project will result in increased greenhouse gas emissions	None			
11.4	Drinking water shortages in project areas as a result of temporal variation in water supply at source caused by to climate change	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
	<b>OVERALL RATING ON CLIMATE CHANGE</b>		<b>M</b>	<b>M</b>	<b>M</b>
12	<b>POLLUTION PREVENTION &amp; RESOURCE EFFICIENCY</b>				
12.1	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and	Formation and strengthen user groups in the community to promote local ownership and sustainability of rural	M	M	M



	infrastructure	water and irrigation schemes (Activity 2.4.1; 2.4.2)			
12.2	Project will cause a long-term increase in air pollution that is harmful to human health	None			
12.3	Project will cause a long-term increase in air pollution that is not harmful to human health	None			
12.4	Project will cause increased use of agriculture chemicals	None			
12.5	Project will result in a risk from hazardous chemicals	None			
12.6	Project will result in long-term increase in flows of polluted water	None			
12.7	Generation of solid and liquid wastes from project activities at construction sites and labor camps that can lead to pollution of local water bodies and natural environment	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
12.8	Project will cause short-term environmental damage (e.g. during construction)	None			
12.9	Project will cause non-sustainable increase in extraction of groundwater	None			
12.10	Project will cause non-sustainable extraction or diversion of water from a surface water source	None			
12.11	Project will cause non-sustainable increase in mineral extraction	None			
12.12	Minor pollution of soils and surface water at project activity sites due to generation of solid and liquid wastes, especially during the rainy season	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
12.13	Disruption of temporary access to water may cause disruption in agriculture activities and reduced	Construction and Rehabilitation of irrigation Water Supply Schemes (Activity	L	M	M

	production diversion of water during construction and rehabilitation of irrigation water supply infrastructure	2.1.1; 2.2.1; 2.2.2)			
12.14	Long distance and terrain between water source and end user catchment may render Infrastructure for water supply inefficient due to leakages, inadequate water volume and inappropriate water pressure	Construction of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
	<b>OVERALL RATING ON POLLUTION PREVENTION &amp; RESOURCE EFFICIENCY</b>		<b>M</b>	<b>M</b>	<b>M</b>
13	<b>PUBLIC HEALTH</b>				
13.1	Public health hazards through contamination of water through collection surfaces of rain water harvesting structures	Rain water harvesting (Activity 2.3.2)	M	M	M
13.2	ProJet will result in increased use of harmful substances (e.g. alcohol)	None			
13.3	Project will cause people to change to less healthy or nutritious diets	None			
13.4	In increased transmission of diseases within communities due to imported labor for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 1.1.5; 1.2.4; 2.1.1; 2.2.1; 2.2.2; 2.3.1; 2.3.2)	M	M	M
13.5	Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure	Construction activities for drinking water supply and rehabilitation works (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON PUBLIC HEALTH</b>		<b>M</b>	<b>M</b>	<b>M</b>
14	<b>PHYSICAL AND CULTURAL RESOURCES/HERITAGE</b>				

14.1	Damage to physical cultural heritage due to establishment of labor camps in culturally sensitive areas	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	L	M
14.2	Project will cause loss of non-physical cultural heritage	None			
14.3	Project will change the appearance of any place that is famous for its natural beauty	None			
14.4	Cultural and religious conflicts from non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
	<b>OVERALL RATING ON PHYSICAL AND CULTURAL RESOURCES/HERITAGE</b>		<b>M</b>	<b>M</b>	<b>M</b>
15	<b>LANDS AND SOIL CONSERVATION</b>				
15.1	Clearing of trees or other vegetation could cause soil erosion	None			
15.2	Minor soil erosion and land degradation in project activity sites due to disturbance to topsoil created by machineries, trucks and construction materials	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	L	M	M
15.3	Changed water flows (e.g. from road drainage or river works) could cause soil erosion	None			
15.4	Project can cause damage to any sensitive landscape	None			
	<b>OVERALL RATING LANDS AND SOIL CONSERVATION</b>		<b>L</b>	<b>M</b>	<b>M</b>
16	<b>POVERTY ALLEVIATION</b>				
16.1	Project will not give priority to poor people to be selected as project beneficiaries	None			

16.2	Project does not include provisions to identify poor households that need assistance from the project	None			
16.3	Poor households will not benefit from the project as much as non-poor households	None			
16.4	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES	PES scheme development and implementation (Activity 1.2.4)	M	M	M
16.5	Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures	Watershed management, PES and water source recharge activities (Activities 1.1.5; 1.2.4; 1.3.5; 2.2.1)	M	L	M
16.6	Disruption of temporary access to water may cause disruption in agriculture activities and reduced production diversion of water during construction and rehabilitation of irrigation water supply infrastructure	Construction and Rehabilitation of irrigation Water Supply Schemes (Activity 2.2.1; 2.2.2)	L	M	M
16.7	Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labor contribution to the project activities and may not be included as project beneficiaries if the project considers communities to provide unskilled labor for project activities.	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	L	M
	<b>OVERALL RATING on POVERTY ALLEVIATION</b>		<b>M</b>	<b>M</b>	<b>M</b>
17	<b>DISASTER MANAGEMENT CAPABILITY</b>				
17.1	Project will result in increased risk of loss of life from natural disasters	None			

17.2	Infrastructure may be rendered inefficient and vulnerable to disasters due to leakages, inadequate water volume and inappropriate water pressure as a result of alignment along rugged terrain over long distances	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
17.3	Project outputs could be damaged by natural disasters	None			
	<b>OVERALL RATING ON DISASTER MANAGEMENT CAPABILITY</b>		<b>M</b>	<b>M</b>	<b>M</b>
18	<b>PESTS AND DISEASE MANAGEMENT</b>				
18.1	Farming activities supported by the project could be affected by crop pests	None			
18.2	Farming activities supported by the project could be affected by livestock diseases	None			
18.3	Risk of spreading pests and diseases within communities due to imported labor for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 1.1.5; 1.2.4; 2.1.1; 2.2.1; 2.2.2; 2.3.1; 2.3.2)	M	M	M
18.4	Risk of spreading pests and diseases within the local vegetation through imported planting materials	Implementation for watershed management and water source recharge activities (Activities 1.1.5; 1.2.4; 1.3.5)	M	L	M
	<b>OVERALL RATING ON PESTS AND DISEASE MANAGEMENT</b>		<b>M</b>	<b>M</b>	<b>M</b>
19	<b>TRANS BOUNDARY ISSUES</b>				
19.1	People engaged in activities related to the project cross international boundaries illegally	None			
19.2	Project will affect water flows across an international boundary	None			

19.3	Project will cause air or water pollution that crosses an international boundary	None			
19.4	Project will have other negative impacts across an international boundary.	None			
	<b>OVERALL RATING ON TRANS BOUNDARY ISSUES</b>	<b>None</b>			

Following project risk identification through participatory process and screening of the project risks by each activity, project overall Project Risk Category has been determined as Category B. However, the principles on Human Rights, Indigenous People and Transboundary issues are not triggered through the participatory risk assessment. Project categorization has been done based on significance of risks on the 16 principles that have been triggered.

#### ESS risk categorization

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
1	<b>OVERALL RATING ON COMPLIANCE WITH THE LAW</b>	Risk of delay in project activities due to delay in obtaining permissions and clearances, delay in obtaining consent to extract water from another local jurisdiction; Risk of delay because of need for compliance with COVID - 19 pandemic norms; Risk of non-compliance to labor laws during implementation of project activities by contractors or project workers; Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations. (Activities 1.1.1;1.1.4; 1.1.2; 1.2.1;1.2.2; 1.2.4; 1.3.1;1.3.2; 1.3.3; 1.4.1; 3.1.1; 4.1.1; 4.1.3; 4.2.2; 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	M	M	M
2	<b>OVERALL RATING ON ACCESS AND EQUITY</b>	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES; Lack of awareness on project activities and plans leading to weak project ownership by local	M	M	M

		stakeholders; Disruption of temporary access to water may cause health and sanitation issues to end users during rehabilitation or construction of drinking water supply infrastructure (( Activities 1.1.1;1.1.4; 1.1.2; 1.2.1;1.2.2; 1.2.4; 1.3.1;1.3.2; 2.1.1 1.3.3; 1.4.1; 3.1.1; 4.1.1; 4.1.3; 4.2.2)			
3	<b>OVERALL RATING ON MARGINALIZED &amp; VULNERABLE GROUPS</b>	Lack of inclusive community participation in PES scheme development could lead to unequal benefits from PES; Vulnerable and marginalized groups may not be included as project beneficiaries if the project considers communities to provide unskilled labor for project activities; Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labor force; with alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labor contribution to the project ( (Activity 1.2.4; 2.1.1; 2.2.1; 2.2.2)	<b>M</b>	<b>M</b>	<b>M</b>
4	<b>OVERALL RATING ON HUMAN RIGHTS</b>	<b>None</b>			
5	<b>OVERALL RATING ON GENDER EQUALITY &amp; WOMEN'S EMPOWERMENT</b>	Women will not have equal opportunities to participate and express their views on aspect of project implementation; Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES; Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders; Households characterized by women or divorcee headed or single parents may not be included as project beneficiaries if the project considers communities to provide unskilled labor for project activities (( Activities 1.1.1;1.1.4; 1.1.2; 1.2.1;1.2.2; 1.2.4;	<b>M</b>	<b>M</b>	<b>M</b>

		1.3.1;1.3.2; 1.3.3; 1.4.1; 3.1.1; 2.1.1; 2.2.1; 2.2.2 4.1.1; 4.1.3; 4.2.2)			
6	<b>OVERALL RATING ON CORE LABOUR RIGHTS</b>	Safety risk associated with pump maintenance such and injury or workers in pump maintenance from through electric shock; Temporary labor from outside the project area will have conflicts with the local population ((Activity 2.1.1; 2.2.2; 2.3.1)	<b>M</b>	<b>M</b>	<b>M</b>
7	<b>OVERALL RATING ON INDIGENOUS PEOPLES</b>	<b>None</b>			
8	<b>OVERALL RATING ON INVOLUNTARY RESETTLEMENT</b>	Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land and on water distribution/allocation arrangements leading to delay in implementation of project activities (Activity 2.1.1; 2.2.1; 2.2.2)	<b>L</b>	<b>L</b>	<b>L</b>
9	<b>OVERALL RATING ON PROTECTION OF FORESTS &amp; NATURAL HABITATS</b>	Challenges in material transport across long distance may lead to construction of haphazard development of access roads and degradation of natural environment and landscape; Minor degradation of forest natural forests due to loss of vegetation through to land clearance during construction and establishment of camps for project activities; Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats; Unproportionate diversion of water from natural streams for drinking and irrigation water supply; Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures; Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations (Activity 1.1.5;1.3.4; 1.2.4; 2.1.1; 2.2.1; 2.2.2;	<b>M</b>	<b>M</b>	<b>M</b>



		2.3.1; 2.3.2;2.3.3; 2.3.4)			
10	<b>OVERALL RATING ON CONSERVATION OF BIOLOGICAL DIVERSITY</b>	Introduction of Alien Invasive Species (AIS) due to imported planting materials for watershed restoration; Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats (Activities 1.1.5;1.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
11	<b>OVERALL RATING ON CLIMATE CHANGE</b>	Weak capacity for climate resilient design and management of water sources and infrastructure could lead to increased risk of climate disasters causing damage to project output; Drinking water shortages in project areas as a result of temporal variation in water supply at source caused by to climate change (Activity 2.1.1; 2.2.1;4.1.2)	<b>M</b>	<b>M</b>	<b>M</b>
12	<b>OVERALL RATING ON POLLUTION PREVENTION &amp; RESOURCE EFFICIENCY</b>	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure; Generation of waste from project activities and labor camps that can lead to pollution of local water bodies and natural environment; Minor pollution of soils and surface water at project activity sites due to generation of solid and liquid wastes, especially during the rainy season; Disruption of temporary access to water may cause disruption in agriculture activities and reduced production due to diversion of water during construction and rehabilitation of irrigation water supply infrastructure; Long distance and terrain between water source and end user catchment may render water supply infrastructure inefficient due as a result of to leakages, inadequate water volume and inappropriate water pressure (Activity 2.1.1; 2.2.1; 2.2.2;	<b>M</b>	<b>M</b>	<b>M</b>

		2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4; 4.2.1)			
13	<b>OVERALL RATING ON PUBLIC HEALTH</b>	Public health hazards through contamination of water through collection surfaces of rain water harvesting structures; Increased transmission of diseases within communities due to imported labor for project activities; Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure (Activity 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2; 2.3.3; 2.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
14	<b>OVERALL RATING ON PHYSICAL AND CULTURAL RESOURCES/H ERITAGE</b>	Damage to physical & cultural heritage due to establishment of labor camps in culturally sensitive areas; Cultural and religious conflicts from non-compliance to local cultural norms during implementation of project activities by contractors or project workers (Activity 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
15	<b>OVERALL RATING LANDS AND SOIL CONSERVATIO N</b>	Minor soil erosion and land degradation in project activity sites due to disturbance to topsoil created by machineries, trucks and construction materials (2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	<b>L</b>	<b>M</b>	<b>M</b>
16	<b>OVERALL RATING On POVERTY ALLEVIATIO N</b>	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES: Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures; Disruption of temporary access to water may cause disruption in agriculture activities and reduced production diversion of water during construction and rehabilitation of irrigation water supply infrastructure; Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able to contribute community labor	<b>M</b>	<b>M</b>	<b>M</b>

		contribution to the project activities and may not be included as project beneficiaries if the project considers communities to provide unskilled labor for project activities (Activities 1.1.5; 1.2.4; 2.1.1; 2.2.1; 2.2.2)			
17	<b>OVERALL RATING ON DISASTER MANAGEMENT CAPABILITY</b>	Infrastructure may be rendered inefficient and vulnerable to disasters due to leakages, inadequate water volume and inappropriate water pressure as a result of alignment along rugged terrain over long distances (2.1.1; 2.2.1))	<b>M</b>	<b>M</b>	<b>M</b>
18	<b>OVERALL RATING ON PESTS AND DISEASE MANAGEMENT</b>	Risk of spreading pests and diseases within communities due to imported labor for project activities; Risk of spreading pests and diseases within the local vegetation through imported planting materials (Activity 1.1.5;1.3.4; 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
19	<b>OVERALL RATING ON TRANS BOUNDARY ISSUES</b>	<b>None</b>			
	<b>Overall Project Risk Category</b>	B (Most project risks are minor, site specific and manageable)	<b>M</b>	<b>M</b>	<b>N</b>

Environment and Social Management Plan (ESMP) has been generated which will then be monitored and evaluated during the course of project implementation in the matrix below (See Annex 1)

**D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.**

The Bhutan Trust Fund for Environmental Conservation (BT FEC) approach to monitoring, reporting and evaluation is explained in its Monitoring and Evaluation Manual & Handbook. The results of M&E will be to provide project updates, risk assessments and any project change required. In summary, M&E will provide answers to questions, in a systematic way, on the progress and success of the project and its partners in achieving the desired outcomes and outputs.

The BT FEC shall hire M&E Officer, on contract, to be responsible for the data collection, compilation, and monitoring and reporting of the project, as well as operational support and additional assistance in the design and implementation throughout the project, adjusting project outcomes and activities according to a changing context. It is important to remain flexible to and learn from inevitable unforeseen changes in the operational landscape using an adaptive management approach. The M&E officer will also monitor and ensure compliance to AF's environmental, social and gender safeguards and policies.

Reporting will take place on a quarterly and annual basis in accordance with Adaptation Fund standards. The monitoring and reporting plan involve an iterative approach to collecting data and improving the project design. The project will commence following an inception workshop with local and national stakeholders, the NIE team and the M&E team assigning and clarifying the project purpose, project roles and responsibilities, and addressing any outstanding barriers to implementation.

The project's comprehensive M&E framework will meet and exceed AF's Minimum Standards on Environmental and Social Safeguards approved in November 2013 and revised in March 2016, the Adaptation Fund's policy, and drawing on the NIE's safeguards formalized under the Accreditation process.

Considering all existing standards, including but not limited to, M&E Manual, ESS and Gender Equity, the key outputs for Monitoring and Evaluation (M&E) are:

- Semi-annual M&E visited conducted
- Semi-annual M&E reported prepared
- External evaluator hired for conducting mid-term evaluation
- Terminal evaluation conducted by NIE and external evaluator

In addition, under the supervision of the NIE's Governance and Audit Committee (GAC), an internal auditor shall be contract to carry out the following tasks:

- Objectively assess IT and/or operational processes
- Assess the EE's risks and the efficacy of its risk management efforts
- Ensure that the EE is complying with relevant laws and statutes
- Evaluate internal control and make recommendations on how to improve
- Identifying shortfalls or gaps in processes
- Promote ethics and help identify improper conduct
- Assure safeguards
- Investigate fraud
- Communicate the findings and recommendations

On annual basis, an external audit shall be conducted by the RAA with an objective to:

- providing reasonable assurance that they are presented fairly and in conformity with applicable accounting principles/standards that they reflect true representation of the expenditure incurred and financial position.
- expressing an opinion on the effectiveness of the design and operation of project.
- reducing information risk that financial reports are biased, misleading, inaccurate, incomplete, and contain material misstatements.

Sl. no	Activity	Responsibility	Budget
1	Inception Workshop	BTFEC	15,000

2	Project Board Meetings	BT FEC, PMU	9,600
3	Adaptation fund secretariat learning missions/site visits	BT FEC, Adaptation Fund Secretariat	NA
4	Mid-term review tracking tools to be updated before Mid-Term Review	BT FEC, MoAF, MoWHS,	10,000
5	Mid-term review	BT FEC	50,000
6	Terminal Evaluation of the project	BT FEC	35,000
7	Addressing social and environmental grievances	Implementing entities and BT FEC	to be charged to project budget
8	Technical Advisory Group meetings	Implementing entities, BT FEC	9,600
9	Supervision and monitoring of activities	PMU, BT FEC	30000

E.

### Project Results Framework

Project Results	Indicator(s)	Baseline	Target(s)	Means of Verification	Risks and Assumptions
<b>Project Objective:</b> To build resilience to climate change and adaptive capacity of water stressed communities					
To build resilience to climate change and adaptive capacity of water stressed communities	No. of direct beneficiaries	0	53,254 (30,384 male and 28,816 female)	The direct beneficiaries include the total number of population of the gewogs identified as project sites.	
To build resilience to climate change and adaptive capacity of water stressed communities	No. of indirect beneficiaries	0	139,661 (72,441 male and 67,220 female)	the indirect beneficiaries will consist of the population of the identified Dzongkhags for the project landscape.	
<b>Component 1:</b>	Adaptive management of watersheds for enhanced community resilience to climate change				
<u>Outcome 1:</u> Increased watershed and ecosystem	Total land area brought under effective				

resilience in response to climate change and variability-induced stress	management				
<u>Output 1.1:</u> Watershed management intervention measures implemented	No of watershed management intervention measures	One watershed management plan in Dagana developed	Detail watershed assessments done in five gewogs in all project site dzongkhags	Record of watershed management intervention measures developed	Priority of field agencies in core activities
<u>Output 1.2:</u> Payments-for-Ecosystem Services (PES) schemes scaled-up	No of PES Schemes explored and established	one each PES schemes established in Paro and Tsirang	Two PES scheme will be explored and established if feasible	Field visits and reports	Willingness from communities or ecosystem services users to participate is there
<u>Output 1.3:</u> Water sources' recharge interventions adopted	No of water sources revived	One water source revival site operational in Paro	Interventions Strengthened and adopted in four sites	Field visits and reports	Limited technical knowledge, difficult terrain may escalate cost
<u>Output 1.4:</u> Wetlands monitoring system established for informed decision-making	No of significant wetlands inventoried and monitoring system put in place	N/A	One wetland monitoring system in place	Record of monitoring system	Limited technical knowledge
<b>Component 2:</b>	Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation				
<u>Outcome 2:</u> Improved access to irrigation and	No. of households connected with climate	N/A  N/A	3,350 households (drinking water)	Annual Progress Report	The baseline data provided

safe drinking water	resilient 24x7 drinking and irrigation water		599 households (Irrigation)		by LGs are reliable; The local implementers (local governments and contractors) have the requisite capacity
<u>Output 2.1:</u> Climate- and disaster-resilient water infrastructure established	Number of climate smart and disaster resilient water system constructed	0	6 water supply schemes	Annual Progress Report	
<u>Output 2.2:</u> Climate- and disaster-resilient irrigation infrastructure established	Area under assured irrigation;	0	945 acres	Annual Progress Report	
<u>Output 2.3:</u> Innovative technology for tapping water adopted	Total coverage area with climate-smart irrigation technology adopted;  No. of households with climate-smart drinking water technology adopted	0  0	100 acres  100 household	Annual Progress Report	
Output 2.4: User groups in the community strengthened for effective management of irrigation and	No. of Water User Associations trained	0	29 WUA trained	Annual Progress Report	



drinking water					
<b>Component 3:</b>	Climate-smart agriculture (CSA) through sustainable land management and informed agrometeorological services				
<u>Outcome 3:</u> Improved food security and livelihoods	Percentage of target households with stable and climate resilient livelihood sources	NA	Target population report food and income availability improved by 20%	Sample household survey; Midterm and end of the project impact report	All project beneficiaries participate and adopt project interventions
<u>Output 3.1:</u> SLM in vulnerable and degraded areas implemented	Total area brought under SLM practices	NA	1500 acres	Annual project progress report; Mid-term and end of project report	Availability of appropriate machines for land development; Willingness of the beneficiaries to take up SLM; No major landslide and flashfloods that would damage the investments made in SLM
	Percentage of population using agrometeorological products and Services	NA	60% of project beneficiaries	Annual project report; Midterm and end of project	Improved weather forecasting with better lead time made

<u>Output 3.2:</u> Climate change information, products and services made available and accessible				report	available by NCHM
<u>Output 3.3:</u> Agricultural disaster risk reduction and management mainstreamed	Public awareness strategy exists to stimulate a culture of disaster resilience, with outreach to rural communities	NA	Climate field school established in the project areas	Project report	
<b>Component 4:</b>	Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots				
<u>Outcome 4:</u> Improved CCA mainstreaming and water governance at the local level	Number of Local Governments with improved capacity for CCA mainstreaming and water governance	Not known but can be said to very low			
<u>Output 4.1:</u> Institutional mechanisms in local governments strengthened for CCA and gender mainstreaming	Number of LGs effectively mainstreaming CCA and gender in local development investments	Basic awareness for CCA and gender mainstreaming exists among LGs but lack tools and	All 19 LGs in the project sites have effectively mainstreamed CCA and gender in their local annual development plan and upcoming	Local annual development plans; Upcoming LG FYPs; Key informant interviews; Project	High-level support, and central guidance and backstopping are available.

		training for effective mainstreaming	FYP	progress reports.	
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**F. Alignment with the Results Framework of the Adaptation Fund**

<b>Project Outcomes</b>	<b>Project Outcome Indicators</b>	<b>AF Outcome</b>	<b>AF Outcome Indicators</b>
<u>Outcome 1:</u> Increased watershed and ecosystem resilience in response to climate change and variability-induced stress		<u>AF Outcome 5:</u> Increased ecosystem resilience in response to climate change and variability-induced stress	<u>AF Outcome Indicator 5:</u> Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress
<u>Outcome 2:</u> Improved access to irrigation and safe drinking water		<u>AF Outcome 4:</u> Increased adaptive capacity within relevant development sector services and infrastructure assets	<u>AF Outcome Indicator 4.2:</u> Physical infrastructure improved to withstand climate change and variability-induced stress
<u>Outcome 3:</u> Improved food security and livelihoods		<u>AF Outcome 6:</u> Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	<u>AF Outcome Indicator 6.1:</u> Percentage of households and communities having more secure access to livelihood assets <u>AF Outcome Indicator 6.2:</u> Percentage of targeted population with sustained climate-resilient alternative livelihoods
<u>Outcome 4:</u>		<u>AF Outcome 3:</u>	<u>AF Outcome</u>

Improved CCA mainstreaming and water governance at the local level		Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	Indicator 3.1: Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses <u>AF Outcome</u> Indicator 3.2: Percentage of targeted population applying appropriate adaptation responses
<b>Project Outputs</b>	<b>Project Output Indicators</b>	<b>AF Outputs</b>	<b>AF Output Indicators</b>
<u>Output 1.1:</u> Watershed management intervention measures implemented		<u>AF Output 5:</u> Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	<u>AF Output Indicator 5.1:</u> No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)
<u>Output 1.2:</u> Payments-for-Ecosystem Services (PES) schemes scaled-up		<u>AF Output 5:</u> Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	<u>AF Output Indicator 5.1:</u> No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)
<u>Output 1.3:</u> Water sources' recharge interventions adopted		<u>AF Output 5:</u> Vulnerable ecosystem services and natural resource assets strengthened in	<u>AF Output Indicator 5.1:</u> No. of natural resource assets created, maintained or improved to withstand

		response to climate change impacts, including variability	conditions resulting from climate variability and change (by type and scale)
Output 1.4: Wetland database established for informed decision-making			No of significant wetlands inventoried and monitoring system put in place
Output 2.1: Climate- and disaster-resilient drinking water infrastructure established			Number of climate smart and disaster resilient water system constructed
Output 2.2: Climate and disaster resilient irrigation infrastructure established			Area under assured irrigation
Output 2.3: Innovative technologies for tapping water adopted			Total coverage area with climate-smart irrigation technology adopted;  No. of households with climate-smart drinking water technology adopted
Output 2.4: User groups in the community strengthened for effective management of irrigation and drinking water		<u>AF Output 6:</u> Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	No. of Water User Associations trained
<u>Output 3.1:</u> SLM in vulnerable and degraded areas implemented		<u>AF Output 6:</u> Targeted individual and community livelihood strategies strengthened in relation to climate change impacts,	<u>AF Output 6.1:</u> No. and type of adaptation assets (tangible and intangible) created or strengthened in support of

		including variability	individual or community livelihood strategies
<u>Output 3.4:</u> Climate change information, products and services made available and accessible		<u>AF Output 2:</u> Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	<u>AF Output 2.2:</u> No. of targeted institutions with increased capacity to minimize exposure to climate variability risks (by type, sector and scale)
<u>Output 3.5:</u> Mainstreamed agricultural disaster risk reduction and management			<u>AF Output 2:</u> Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events
<u>Output 4.1:</u> Institutional mechanisms at local level strengthened for CCA mainstreaming in local development plans and activities related to drinking water, irrigation and sustainable land management			Number of LGs effectively mainstreaming CCA and gender in local development investments

- G. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

Detailed implementation budget per Component:

Output	Activities	Budget (USD)					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total per Activity
Component 1: Adaptive management of watersheds to enhance climate resilience of communities							
Output 1.1 Watershed management intervention measures implemented	Activity 1.1.1 Conduct community consultations and sensitizations	10,800	0	0	0	0	10,800
	Activity 1.1.2 Training Workshops	8,000	8,000	0	0	0	16,000
	Activity 1.1.3 Conduct detailed watershed assessments in the project dzongkhags	8,000	9,600	0	0	0	17,600
	Activity 1.1.4 Development of watershed management intervention measures for the prioritized areas	0	0	24,000	0	0	24,000
	Activity 1.1.5 Implementation of identified intervention measures	0	0	0	0	274,400	274,400
	Subtotal Output 1.1	26,800	17,600	24,000	0	274,400	342,800
	Output 1.2 Payments-for-Ecosystem	Activity 1.2.1 Conduct community consultations and sensitizations	10,800	0	0	0	0

Services (PES) schemes scaled-up	Activity 1.2.2 Hands-on training workshops in the management of PES schemes	0	11,200	0	0	0	11,200
	Activity 1.2.3 Conduct detailed resource assessment and inventory	0	24,000	0	0	0	24,000
	Activity 1.2.4 PES scheme development and implementation based on the feasibility	0	0	24,000	9,600	0	33,600
	<b>Sub-total Output 1.2.</b>	<b>10,800</b>	<b>35,200</b>	<b>24,000</b>	<b>9,600</b>	<b>0</b>	<b>79,600</b>
Output 1.3 Water sources' recharge interventions adopted	Activity 1.3.1 Conduct community consultations and sensitizations (one per gewog)	10,800	0	0	0	0	10,800
	Activity 1.3.2 Training Workshops (at least one per dzongkhag)	6,400	14,400	14,400	0	0	35,200
	Activity 1.3.3 Development of planning of intervention measures for the prioritized area	0	8,800	0	0	0	8,800
	Activity 1.3.4 Implementations of intervention action plan activities	0	0	189,051	0	0	189,051
	Activity 1.3.5 Monitoring and maintenance of conservation /restoration activities	0	0	0	20,000	20,000	40,000
	<b>Sub-total Output 1.3.</b>	<b>17,200</b>	<b>23,200</b>	<b>203,451</b>	<b>20,000</b>	<b>20,000</b>	<b>283,851</b>



Output 1.4 Wetland monitoring system for informed decision- making established	Activity 1.4.1 Training Workshops for capacity building of field offices	10,800	0	0	0	0	10,800
	Activity 1.4.2 Conduct mapping of wetlands for the project Dzongkhags using remote sensing	0	16,000	0	0	0	16,000
	Activity 1.4.3 Field data collection and mapping	0	0	40,000	0	0	40,000
	Activity 1.4.4 Data compilation and analysis, feeding decision making mechanisms	0	0	0	14,400	0	14,400
	<b>Sub-total output 1.4</b>	<b>10,800</b>	<b>16,000</b>	<b>40,000</b>	<b>14,400</b>	<b>0</b>	<b>81,200</b>
	Contingency	0	0	0	0	12,549	12,549
<b>Total Component 1</b>		<b>65,600</b>	<b>92,000</b>	<b>291,451</b>	<b>44,000</b>	<b>306,949</b>	<b>800,000</b>

**Component 2: Climate resilient water infrastructures for uninterrupted supply of water for drinking and irrigation**

Output 2.1 Climate and disaster resilient drinking water infrastructure established	Activity 2.1.1. Construction and Rehabilitation of atleast 6 Drinking Water Supply Schemes	600,000	1,000,000	1,000,000	898,000	0	3,498,000
	Activity 2.1.2. Development of Water Inventory	0	0	10,000	0	0	10,000
	Activity 2.1.3. Capacity Building of Engineers in Climate Resilient Water Supply Infrastructures	0	0	12,500	12,500	0	25,000
	<b>Sub-total Output 2.1</b>	<b>600,000</b>	<b>1,000,000</b>	<b>1,022,500</b>	<b>910,500</b>	<b>0</b>	<b>3,533,000</b>

Output 2.2: Climate and disaster resilient irrigation infrastructure established	Activity 2.2.1. Construction of at least two pressurized/closed irrigation systems (gravity)	155,000	258,000	258,000	277,700	155,000	1,103,700
	Activity 2.2.2. Re-engineering/ rehabilitation or improvement of four existing irrigation systems	175,000	291,000	291,000	233,000	175,000	1,165,000
	Activity 2.2.3. Scale up micro-irrigation system (drip & sprinkler)	26,000	44,000	44,000	35,000	26,000	175,000
	Activity 2.2.4. Tail water management	0	0	7,000	6,000	0	13,000
	<b>Sub-total Output 2.2</b>	<b>356,000</b>	<b>593,000</b>	<b>600,000</b>	<b>551,700</b>	<b>356,000</b>	<b>2,456,700</b>
Output 2.3 Innovative Technologies for tapping water adopted	Activity 2.3.1. Promote and Scale up solar/electric/manual water pump for irrigation	24,000	40,000	40,000	32,000	24,000	160,000
	Activity 2.3.2. Build water harvesting structures or small-scale reservoirs to tap water for irrigation	4,000	7,000	7,000	5,000	4,000	27,000
	<b>Sub-total Output 2.3</b>	<b>28,000</b>	<b>47,000</b>	<b>47,000</b>	<b>37,000</b>	<b>28,000</b>	<b>187,000</b>
Output 2.4: User groups in the community strengthened for effective	Activity 2.4.1 Form and strengthen user groups in the community to promote local ownership and sustainability of rural drinking water	0	8,000	8,000	8,000	8,000	32,000

management of irrigation and drinking water	Activity 2.4.2 Form and strengthen user groups in the community to promote local ownership and sustainability of irrigation scheme	0	8,000	8,000	8,000	8,000	32,000
	<b>Sub-total Output 2.4</b>	<b>0</b>	<b>16,000</b>	<b>16,000</b>	<b>16,000</b>	<b>16,000</b>	<b>64,000</b>
	Contingency					143,997	143,997
<b>Total Component 2</b>		<b>984,000</b>	<b>1,656,000</b>	<b>1,685,500</b>	<b>1,515,200</b>	<b>543,997</b>	<b>6,384,697</b>

<b>Component 3: Climate-smart agriculture through sustainable land management and informed agro-meteorological services</b>							
<b>Output 3.1</b> SLM in vulnerable and degraded areas implemented	Activity 3.1.1 Participatory SLM action planning to validate key SLM interventions	7,534	0	0	0	0	7,534
	Activity 3.1.2 Implementation of SLM measures-terracing, contour hedgerows and landslide stabilization	221,781	221,781	221,781	221,781	12,877	900,001
	Activity 3.1.3 Technical assistance and support to communities on the implementation of SLM practices in the field	1,370	1,370	1,370	1,370	1,370	6,850
	Activity 3.1.4 Field -based and specialized training to farmers and agriculture extension staff on SLM technologies to enable them to respond to climate change induced risks and	5,137	5,137	5,137	5,137	0	20,548

	impacts with more competence and knowledge						
	Activity 3.1.5 Learning visits for extension officers on SLM and Climate change	0	34,247	0	0	0	34247
	Activity 3.1.6 Monitoring and technical assistance to support communities in implementation of SLM and to see the work progress	1,096	1,096	1,096	1,096	1,096	5,480
	Activity 3.1.7 Documentation, knowledge Management (KM) and experience sharing platforms (three stakeholder workshops)	5,479	5,479	5,479	5,479	5,479	27,395
	<b>Sub-total Output 3.1</b>	<b>242,397</b>	<b>269,110</b>	<b>234,863</b>	<b>234,863</b>	<b>20,822</b>	<b>1,002,055</b>
<b>Output 3.2</b> Climate change information, products and services made available and accessible	Activity 3.2.1 Agro-met advisory bulletins appropriately packaged and disseminated timely	1,429	1,429	1,429	1,428	1,428	7,143
	Activity 3.2.2 Incorporation of area specific weather and crop data in ADSS	11,430	0	5,715	0	5,715	22,860
	Activity 3.2.3 Capacity building of agro-met focal points based in ARDCs and Central Programs (Two major trainings)	0	21,429	0	21,429	0	42,858
	Activity 3.2.4 Knowledge management and communication activities		3,572			3,572	7,144
	<b>Sub-total Output 3.2</b>	<b>12,859</b>	<b>26,430</b>	<b>7,144</b>	<b>22,857</b>	<b>10,715</b>	<b>80,005</b>

<b>Output 3.3</b> Agricultural disaster risk reduction and management mainstreamed	Activity 3.3.1 Initiation of Climate / farmer Field Schools to bring transformational change by enhancing response capacity to identified risks in four dzongkhags.	10,714	10,714	10,714	10,714	0	42,856
	Activity 3.3.2 Sensitization, awareness and capacity development on agro-met services to researchers, extension and farmers	9,523	9,523	9,523	0	0	28,569
	Activity 3.3.3 Development of crop suitability and feasibility maps	10,000	0	10,000	0	0	20,000
	Activity 3.3.4 Pest and diseases forecasting services (5 plant protection officials trained)	14,285	0	14,285	0	0	28,570
	<b>Sub-total Output 3.3</b>	<b>44,522</b>	<b>20,237</b>	<b>44,522</b>	<b>10,714</b>	<b>0</b>	<b>119,995</b>
	Contingency	0	0	0	0	28,000	28,000
	<b>Total Component 3</b>	<b>299,778</b>	<b>315,777</b>	<b>286,529</b>	<b>268,434</b>	<b>59,537</b>	<b>1,230,055</b>

Component 4: Improved local governance for effective CCA mainstreaming with focus on water management at the grassroots							
<b>Output 4.1:</b> Institutional mechanism in Local Governments strengthened for CCA and gender mainstreaming	Activity 4.1.1. Conduct sensitization workshop for LGs and communities on mainstreaming CCA and gender in local development plans, programs and activities related to drinking water, irrigation and SLM	20,000	20,000	15,000	15,000	0	70,000
	Activity 4.1.2. Conduct capacity development training for LGs on CCA invest tools, frameworks and approaches.	20,000	20,000	15,000	15,000	5,000	75,000
	Activity 4.1.3. Carry out M&E of CCA and gender mainstreaming in their plans, programs and activities.	10,000	20,000	10,000	10,000	5,000	55,000
	<b>Sub-total Output 4.1</b>	<b>50,000</b>	<b>60,000</b>	<b>40,000</b>	<b>40,000</b>	<b>10,000</b>	<b>200,000</b>
	Contingency					4,667	4,667
<b>Total Component 4</b>		<b>50,000</b>	<b>60,000</b>	<b>40,000</b>	<b>40,000</b>	<b>14,667</b>	<b>204,667</b>
<b>Total Direct Cost</b>		<b>1,399,378</b>	<b>2,123,777</b>	<b>2,303,480</b>	<b>1,867,634</b>	<b>925,150</b>	<b>8,619,419</b>
Project execution cost (PMU)		105,500	152,600	152,600	132,600	56,700	600,000
<b>Total (Direct + PMU cost)</b>		<b>1,504,878</b>	<b>2,276,377</b>	<b>2,456,080</b>	<b>2,000,234</b>	<b>981,850</b>	<b>9,219,419</b>
PCM Fee charged by the Implementing Entity <sup>23</sup>		204,033	120,147	157,296	128,445	169,615	779,536
<b>Grand total</b>		<b>1,708,911</b>	<b>2,396,524</b>	<b>2,613,376</b>	<b>2,128,679</b>	<b>1,151,465</b>	<b>9,998,955</b>

<sup>23</sup> Please see detailed Budget for PCM fee

### Budget Notes

SN.	Component 1 (total \$800,000)
1	<p>Consultation and sensitization workshop for communities of 24 gewogs@\$450 – (\$10,800)</p> <p>Hand-on training workshop and study visits 4 trainings@\$4,000- (\$16,000)</p> <p>Conduct detailed water assessment in four dzongkhags @\$4,400 – (\$17,600)</p> <p>Develop watershed management interventions in four dzongkhags@\$6,000 – (\$24,000)</p> <p>Implement invention measures in four dzongkhags @\$68,600 – (274,400)</p> <p>Sub-total - \$342,800</p>
2	<p>Consultation and sensitization workshop for communities of 24 gewogs@\$450 – (\$10,800)</p> <p>Hand-on training workshop in the management of PES schemes 4 trainings@\$2,800- (\$11,200)</p> <p>Conduct detailed resource assessment and inventory on per dzongkhag @\$6,000 – (\$24,000)</p> <p>Develop 2 PES Scheme @\$16,800 – (\$33,600)</p> <p>Sub-total \$79,600</p>
3	<p>Consultation and sensitization workshop for communities of 24 gewogs@\$450 – (\$10,800)</p> <p>Training workshop 4 trainings@\$8,800- (\$35,200)</p> <p>Develop four intervention measures plan @\$2,200 – (\$8,800)</p> <p>Implement interventions in four dzongkhags@\$47,263 – (\$189,051)</p> <p>Monitoring and restoration in four dzongkhags@\$10,000 – (\$40,000)</p> <p>Sub-total \$283,851</p>
4	<p>Capacity building of four field staff@\$2,700 – (\$10,800)</p> <p>Mapping of wetlands in four dzongkhags@\$4,000 – (\$16,000)</p> <p>Data collection four in four dzongkhags@\$10,000 – (\$40,000)</p> <p>Data compilation and analysis in four dzongkhags@\$3,600 – (\$14,400)</p> <p>Sub-total \$81,200</p> <p>Contingency \$12,549</p>
	<b>Component 2 (total \$6,384,697)</b>
5	<p>Contractual services for construction of drinking water schemes including cost of equipment and materials (transmission lines and distribution network of approximately 122kms, intakes and reservoirs for 6 drinking water schemes @583,000: \$ 3,498,000</p>

6	Workshops, capacity building and trainings, data collection for engineers: \$35,000
7	Contractual services for construction of irrigation systems including material costs, equipment and labor cost of 14 kms at unit cost @ \$ 78,836 (\$1,103,700)
8	Contractual services for rehabilitation and improvement of irrigations systems (24.8 km @ unit cost of 46,967)- \$1,165,000
9	Procurement of equipment and capacity building for water management systems (13 systems-tail water, water harvesting structures, etc) (\$ 188,000)
10	Conduct assessment, surveys and designs of the irrigation water schemes (\$ 187,000)
11	Community consultations, sensitization workshops, travel for the staff and local leaders \$ 64,000
12	Contingency fund -\$143,997
	<b>Component 3 (total \$1,230,055)</b>
13	Consultation workshops and meeting for a participatory SLM action planning –(\$ 7,534)
14	Contractual services including hiring of equipment and labor costs for SLM interventions-terracing (1000 Acres), contour hedgerows (500 Acres) and landslide stabilization measures (20 Acres)- (\$900,001)
15	Capacity development of 500 heads for three days –(\$27,398)
16	Exchange visits for Extension Officers 10 heads@\$3,427 – (\$34,247)
17	Monitoring and field documentation semi-annually@\$1,096/year –(\$5,480)
18	Consultation workshop on planning. Budgeting & Progress reporting annually@5,479-(\$27,395)
19	Dissemination of climate change information and services through knowledge management and communication activities - ( \$ 80,005)



20	Initiation of Climate/Farmer Field Schools to bring transformational change by enhancing response capacity to identified risks in four dzongkhags for first four years @10,714 -(\$ 42,856)
21	10 Sensitization, awareness and capacity development programs on agro-met services @9,523 each for first three years (\$ 28,569)
22	Development of eight maps for crop suitability and feasibility @2,500- (\$20,000)
23	Capacity building of five plant protection officials @ 5,714 - (\$28,570)
24	Contingency - \$28,000
	<b>Component 4 (total \$204,667)</b>
25	Sensitization workshops and meetings with local government officials -\$70,000
26	Capacity development of Local Government officials on CCA tools, frameworks and approaches-\$ 75,000
27	Consultancy services for conducting M & E of CCA and gender mainstreaming activities in the local governments - \$55,000
28	Contingency - \$4,667
	<b>Project Execution (\$600,000)</b>
29	PMU monitoring and other project related travel costs \$4600 annually - (\$23,000)
30	Individual contract services for 3 officers for 5 years (3*\$16,000*5) - (\$240,000)
31	PMU vehicle (\$40,000), PMU officer furniture (\$3,000)
32	Procurement of IT equipment for project staffs-laptops, printers, IT accessories, software, etc - (\$9,900)

33	Stakeholder consultations and knowledge exchange programs with the community members and the project implementers. Capacity building of engineers, project component implementers and local government officials - (\$280,000)
	<b>PCM Fee charged by the Implementing Entity (779,536)</b>
38	Compensation/remuneration for project staffs in supporting Executing Entities and reporting to AF for the project period-(\$22,235/years) = \$111,175
39	M&E Officer (\$14,243/year) - \$71,215, ESG Expert (\$16,122/year) - \$80,610, Mid-term evaluation - \$30,000 and Terminal assessment - \$40,000, In country monitoring travel (\$15,000/year) - \$75,000 = 296,825
40	Mobility \$58,285, POL & maintenance \$1,800/year- \$9,000, accounting software annual maintenance cost (\$2,500/year)- \$12,500, Office Stationery (\$2,400/year) - \$12,000, Utilities (\$2,200/year) - \$11,000, rental (\$3,000/year)-\$15,000 = \$117,785
41	Office equipment & furniture = \$27,250
42	NIE Capacity Building- \$20,000/year = \$99,000
43	Semi-annual internal auditing - \$25,000 and annual auditing services- \$12,500 = \$37,500
44	Stakeholder Workshop for learning and experience sharing and dissemination of learnings (\$18,000*5) = \$90,000

**Budget breakdown details:**

	<b>Project Execution Cost</b>						
	<b>Activities</b>	<b>Year-1</b>	<b>Year-2</b>	<b>Year-3</b>	<b>Year-4</b>	<b>Year-5</b>	<b>Total</b>
<b>Project managemen</b>	Travel, workshops and conferences	4,600	4,600	4,600	4,600	4,600	23,000

<b>t Unit</b>	Contractual services-Individual	48,000	48,000	48,000	48,000	48,000	240,000
	Equipment and Furniture	43,000	0	0	0	0	43,000
	IT equipment	9,900	0	0	0	0	9,900
	Trainings and Capacity Building and Knowledge Management	0	100,000	100,000	80,000	0	280,000
	<b>Subtotal project execution cost- PMU</b>	<b>105,500</b>	<b>152,600</b>	<b>152,600</b>	<b>132,600</b>	<b>52,600</b>	<b>595,900</b>
	Contingency	0	0	0	0	4,100	4,100
	<b>Total Execution cost</b>	<b>105,500</b>	<b>152,600</b>	<b>152,600</b>	<b>132,600</b>	<b>56,700</b>	<b>600,000</b>

	Activities	Year-1	Year-2	Year-3	Year-4	Year-5	Total
PCM Fee charged by the Implementing Entity	Contractual services	20,417	21,326	22,235	23,144	24,053	111,175
	Monitoring & Evaluation (includes ESG compliance)	42,881	44,121	75,361	46,601	87,862	296,826
	Administrative expenses	69,485	9,200	12,700	13,200	13,200	117,785
	Office Furniture and Equipment	25,750	0	1,500	0	0	27,250
	NIE Capacity Building	20,000	20,000	20,000	20,000	19,000	99,000
	Auditing services	7,500	7,500	7,500	7,500	7,500	37,500
	Capacity Building of EE and Knowledge Management	18,000	18,000	18,000	18,000	18,000	90,000
	<b>Total Implementing Cost</b>	<b>204,033</b>	<b>120,147</b>	<b>157,296</b>	<b>128,445</b>	<b>169,615</b>	<b>779,536</b>

H.

Include a disbursement schedule with time-bound milestones.

<b>Schedule date</b>	<b>Jan - Dec 22</b>	<b>Jan- Dec 23</b>	<b>Jan- Dec 24</b>	<b>Jan- Dec 25</b>	<b>Jan- Dec 26</b>	<b>Total</b>
Direct cost	1,399,378	2,123,777	2,303,480	1,867,634	925,149	8,619,419
Execution cost	105,500	152,600	152,600	132,600	56,700	600,000
NIE cost	204,033	120,147	157,296	128,445	169,615	779,536
<b>Total cost</b>	<b>1,708,911</b>	<b>2,396,524</b>	<b>2,613,376</b>	<b>2,128,679</b>	<b>1,151,464</b>	<b>9,998,955</b>



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

- A. Record of endorsement on behalf of the government<sup>24</sup>** *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

<p style="text-align: center;"><i>Rinchen Wangdi (Mr.) Director (NDA to Adaptation Fund) Gross National Happiness Commission Secretariat</i></p>	<p style="text-align: center;">Date: July, 28, 2021</p>
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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/programme 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 with reference to the following acts, rules, guidelines, etc:

- Forest and Nature Conservation Act 1995,
- Forest and Nature Conservation Rules and Regulations of Bhutan 2017,
- PES Framework for Bhutan 2015,
- Bhutan Drinking Water Quality Standards 2016 and Wetland Inventory Framework.
- Agriculture Land Development Guidelines (ALDG) 2017 of the Ministry of Agriculture & Forests
- Implementation Modalities for Agriculture Land Development and Fallow Land Reversion, circulated to all the implementers vide letter No. DOA/ARED/Adm-01 /2019 dated 30thSeptember, 2019
- Soil Conservation Manual (SCM), 2019 of the National Soil Services Centre, Department of Agriculture, MoAF
- Land Act 2007,

<sup>24</sup>. 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.

•	Bhutan Water Policy 2008
•	Water Act of Bhutan 2011
•	Water Regulation of Bhutan 2014.
•	Agriculture and Land Development Guideline 2017.
•	Labor Employment Act, 2007.
•	The Local Governance Act, 2009.
•	The National Gender Equality Policy 2019.
and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
<p style="text-align: center;"><i>e-Signature in pdf file</i></p> <p style="text-align: center;">Singye Dorji, Officer In-charge Implementing Entity Coordinator</p>	
Date: August, 09, 2021	Tel. and email: Landline: +975 2 339861 Mobile no: +975 17999777 email: singye@bhutantrustfund.bt
Project Contact Person: Singye Dorji	
Tel. And Email: Landline: +975 2 339861 Mobile no: +975 17999777 email: singye@bhutantrustfund.bt	

## Adaptation to Climate-induced Water Stresses through Integrated

## **Landscape Management in Bhutan**

### **Environmental and Social Assessment and Management Plan**

**Bhutan Trust Fund for Environmental Conservation**



## ESS Assessment and Management Plan

### A. Project Information

<b>Project Information</b>	
1. Project Title	Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan
2. Project Grant Amount (US\$)	9,998,955
3. Grantor Agency	GEF
4. Location (Global/Region/Country)	Bhutan (Dagana, Paro, Sarpang and Tziring districts)
5. Project Start Date	January 2022
6. Project End Date	December 2026
7. Implementing Entity (NIE)	Bhutan Trust Fund for Environmental Conservation (BT FEC)
8. BT FEC Focal Strategic Areas	Mitigating and adapting to climate change

### B. Description of Project Locations

Dzongkhag	Gewogs	Remarks
Dagana	Dorona Drujeygang Gesarling Largyab Lhamoizingkha Tashiding Tshangkha Tshendagang	Community representatives of Karmaling and Lhamoizingkha Gewogs could not participate due to COVID-19 norms.
Paro	Dhopshari Dokar Luungyi Lamgong Naja Doteng Tsento Wangchang	
Tziring	Triangtoe, Phuentenchhu and Semjong	Tziring Dzongkhag is not included in the project concept note. It has been added upon recommendations by the GNHC and upon acceptance by the Adaptation Fund in May, 2021. Out of the 12 gewogs the Dzongkhag

		prioritized inclusion of these three gewogs in the project. Component 2 of the project will focus on drinking water supplies in Tzirang
Sarpang	Serzhong, Chuzergang, Shompangkha, Gelephu and Chudzom	Sarpang Dzongkhag is not included in the project concept note. It has been added upon recommendations by the GNHC and upon acceptance by the Adaptation Fund in May, 2021. Out of the 12 gewogs the Dzongkhag prioritized inclusion of these five gewogs of Serzhong, Chuzergang, Shompangkha, Gelephu and Chudzom in the project. Component 2 of the project will focus on drinking water supplies in Sarpang

### C. ESS Risk Assessment

Participants at the session stakeholder consultation ESS and gender included the Dzongkhag Planning Officer, Dzongkhag engineer, environment officer, Dzongkhag gender focal person, Dzongkhag Agriculture officer, the Gups of concerned gewogs, Mangmis, and additional male and female representatives of each gewog. These consultations were held at locations that are easily reachable by local communities as identified local officials.

Each session started with an introduction about BTFEC and status of the proposed project, and overview of AF and BTFEC's ESS policies and need for participatory ESS risk assessment. Upon briefing on the project activities participants were asked to identify risks and impacts including vulnerable groups associated with the project activities by each category of AF ESS principles in smaller groups. Color coded pieces of chart papers were used to collect the perspective of each small group. The risks, impacts and vulnerable groups identified by each small group were discussed at the plenary for contextual understanding and clarity.

Vulnerable and marginalized groups identified by these consultations are identified as households characterize by isolated and dotted settlements; communities without motorable access road; households with only elderly members & without households labour force; households with alcoholic heads; household with very few household members; Households with empty or no resident members; women and divorcee headed households. These vulnerable groups may not be able contribute actively participate in the project such as in consultations, community labour contribution to and other forms of participation and may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities.

The risks and impacts identified by the stakeholder consultations are described in table C1.

C1 Description of project activities and identifying Environmental and Social Risks

Outputs	Activities	Risks	Impacts
Output 1.1 Watershed management intervention measures implemented	Activity 1.1.1 Conduct community consultations and sensitizations	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 1.1.2 Training Workshops	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Project activities may be delayed
	Activity 1.1.3 Conduct detailed watershed assessments in the project dzongkhags	No risks foreseen	
	Activity 1.1.4 Development of watershed management intervention measures for the prioritized areas	No risks foreseen	
	Activity 1.1.5 Implementation of identified intervention measures	Grievance related to lack of awareness on project intervention measures	Lack of project ownership by local stakeholders
		Restrictions may be imposed on some grazing areas that fall in water catchment protection interventions	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources
		Risk of spreading pests and diseases due imported labour and planting materials for the identified interventions	Spread of pests and diseases among local communities and local vegetation

Outputs	Activities	Risks	Impacts
		Introduction of Alien Invasive Species (AIS) and spread of pest and diseases due to imported planting materials for watershed restoration interventions	Spread of pests and diseases within local vegetation and loss of biodiversity
		Impact on wild life in the form of restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
Output 1.2 Payments-for-Ecosystem Services (PES) schemes scaled-up	Activity 1.2.1 Conduct community consultations and sensitizations in each gewog	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 1.2.2 Hands-on training workshops in the implementation and management of PES schemes	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Project activities may be delayed
	Activity 1.2.3 Conduct detailed resource assessment and inventory in each Dzongkhag	No risks foreseen	
	Activity 1.2.4 PES scheme development and implementation based on feasibility	Lack of inclusive community participation in PES scheme development	Unequal benefits from PES
		Restrictions may be imposed on some grazing areas that fall in water catchment protection	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources

Outputs	Activities	Risks	Impacts
		Risk of spreading pests and diseases due to imported labour and planting materials	Spread of pests and diseases among local communities and local vegetation
		Introduction of Alien Invasive Species (AIS) and spread of pest and diseases due to imported planting materials for watershed restoration	Spread of pests and diseases within local vegetation and loss of biodiversity
		Impact on wild life in the form of restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
Output 1.3 Water sources' recharge interventions adopted	Activity 1.3.1 Conduct community consultations and sensitizations in each gewog	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 1.3.2 Training Workshops	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Project activities may be delayed
	Activity 1.3.3: Conduct field works	No risks foreseen	
	Activity 1.3.4: Planning of intervention measures for the prioritized areas	No risks foreseen	

<b>Outputs</b>	<b>Activities</b>	<b>Risks</b>	<b>Impacts</b>
	Activity 1.3.5 implementations of intervention action plan activities	Lack of awareness on project activities and plans	Weak project ownership by local stakeholders
		Restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		Restrictions may be imposed on some grazing areas that fall in water catchment protection	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources
		Introduction of Alien Invasive Species (AIS) Due to imported planting materials for watershed restoration	Spread of pests and diseases within local vegetation and loss of biodiversity
	Activity 1.3.6: Monitoring and maintenance of conservation/restor ation activities	No risks foreseen	
Output 1.4 Wetland monitoring system established for informed decision- making established	Activity 1.4.1 Training Workshops or capacity building of field offices	Pandemic norms may restrict gathering for training sessions	Project activities may be delayed
	Activity 1.4.2 Conduct mapping of wetlands for the project Dzongkhags using remote sensing	No risks foreseen	
	Activity 1.4.3 Field data collection and mapping in all project gewogs	No risks foreseen	
	Activity 1.4.4 Data compilation and analysis feeding	No risks foreseen	

Outputs	Activities	Risks	Impacts
	decision making mechanisms		
Output 2.1: Climate- and disaster-resilient drinking water infrastructure established	Activity 2.1.1. Construction and Rehabilitation of Drinking Water at least 6 Supply Schemes	Disturbance to topsoil created by machineries and trucks	Minor soil erosion and land degradation in project activity sites
		Generation of solid and liquid wastes from project activities at construction sites	Minor pollution especially during the rainy season.
		End water suffer temporary disruption on drinking water supply a result of construction and rehabilitation works and temporally diversion of water supply	Temporary disruption in water supply causing health and sanitation issues
		Impact on wild life in the form or restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife
		Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers	Conflict with regulations
		Risk of non-compliance to nature conservation regulations during implementation of project activities by contractors or project workers	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife
		Risk of non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Conflict with regulations and local cultural norms  Cultural and religious conflicts among project workers and local communities

Outputs	Activities	Risks	Impacts
		Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land; on water distribution arrangements	Delay in implementation of project activities
		Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labour force; with alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labour contribution to the project	Vulnerable and marginalized groups may not be included as project beneficiaries
		Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labour contribution to the project	Poor community members may not be included as project beneficiaries
		Unhygienic accommodation and inadequate accommodation in labour camps for temporary labour from outside the project area may lead to health and safety of project workers	Impact on health and safety of project workers
		Increased waste from project activities and labour camps	Pollution of local water bodies and natural environment
		Risk of spreading pests and diseases within communities due to imported labour for	Spreading of pests and diseases within communities



Outputs	Activities	Risks	Impacts
		project activities	
		Loss of vegetation due to land clearance during construction and establishment of camps for project activities	Minor degradation of forest natural forests
		Establishment of labour camps in culturally sensitive areas	Damage to physical cultural heritage
		alignment along rugged terrain over long distances	Infrastructure may be rendered inefficient and vulnerable to disasters due to leakages, inadequate water volume and inappropriate water pressure
		increased waste from project activities and labour camps	Pollution of local water bodies and natural environment
		Unproportionate diversion of water from natural streams for drinking and irrigation water supply	Water bodies may dry up Integrity of watersheds may be compromised
		Soil erosion from construction activities	Land degradation
		Challenge in availing consent for use of water sources or raw materials from another gewog	Delay of project activities
		Challenges in material transport across long distance may lead to construction of haphazard development of access roads	Degradation of natural environment and landscape
		Delay in permits and clearances for project work	Delay of project activities
		Temporal variation in water supply at source due to climate change	Drinking water shortages
	Activity 2.1.2. Dev of Water Inventory	No risks foreseen	

Outputs	Activities	Risks	Impacts
	Activity 2.1.3. Capacity Building of Engineers in Climate Resilient Water Supply Infrastructures	No risks foreseen	
Output 2.2: Climate and disaster resilient irrigation infrastructure established	Activity 2.2.1. Construction of at least 2 pressurized/closed irrigation systems (gravity)	Disturbance to topsoil created by machineries and trucks	Minor soil erosion and land degradation in project activity sites
		Generation of solid and liquid wastes from project activities at construction sites	Minor pollution especially during the rainy season.
		End users may face temporary disruption on irrigation water supply as a result of construction works and temporary shortage diversions	Temporary disruption in water supply causing disruption to agriculture activities
		Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers	Conflict with regulations
		Risk of non-compliance to nature conservation regulations during implementation of project activities by contractors or project workers	Degradation of natural environment and landscape
		Risk of non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Conflict with regulations and local cultural norms  Cultural and religious conflicts among project workers and local communities
		Impact on wild life in the form of restricting access to water holes, disturbance to natural habitats	Disturbance to wildlife

Outputs	Activities	Risks	Impacts
		Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land; on water distribution arrangements	Delay in implementation of project activities
		Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labour force; with alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labour contribution to the project	Vulnerable and marginalized groups may not be included as project beneficiaries
		Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labour contribution to the project	Poor community members may not be included as project beneficiaries
		Restrictions may be imposed on some grazing areas that fall in water catchment protection	Livestock rearing practices may change as pastures would be restricted for water source protection and conservations measures at water sources
		Unhygienic accommodation and inadequate accommodation in labour camps for temporary labour from	Impact on health and safety of project workers

Outputs	Activities	Risks	Impacts
		outside the project areas	
		Unhygienic accommodation and inadequate accommodation in labour camps for temporary labour from outside the project area may lead to health and safety of project workers	Impact on health and safety of project workers
		Increased waste from project activities and labour camps	Pollution of local water bodies and natural environment
		Limited loss of vegetation due to land clearance during construction and establishment of camps for project activities	Minor degradation of forest natural forests
		Establishment of labour camps in culturally sensitive areas	Damage to physical cultural heritage
		alignment along rugged terrain over long distances	Infrastructure may be rendered inefficient and vulnerable to disasters due to leakages, inadequate water volume and inappropriate water pressure
		Unproportionate diversion of water from natural streams for drinking and irrigation water supply	Water bodies may dry up Integrity of watersheds may be compromised
		Soil erosion from construction activities	Land degradation
		Challenge in availing consent for use of water sources or raw materials from another gewog	Delay of project activities
		Challenges in material transport across long distance may lead to construction of haphazard development of access roads	Degradation of natural environment and landscape

Outputs	Activities	Risks	Impacts
		Delay in permits and clearances for project work	Delay of project activities
		Temporal variation in water supply at source due to climate change	Drinking water shortages
		Risk of spreading pests and diseases within communities due to imported labour for project activities	Spreading of pests and diseases within communities
	Activity 2.2.2. Re-engineering/ rehabilitation or improvement of 4 existing irrigation systems	Risk of spreading pests and diseases within communities due to imported labour for project activities	Spreading of pests and diseases within communities
		End users may face temporary disruption on irrigation water supply as a result of construction works and temporally shortage diversions	Temporary disruption in water supply causing disruption to agriculture activities
		Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land; on water distribution arrangements	Delay in implementation of project activities
		Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labour force; with alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labour contribution to the project	Vulnerable and marginalized groups may not be included as project beneficiaries

Outputs	Activities	Risks	Impacts
		Poor community members (households characterized by lack of adequate shelter; limited land holding or share croppers) may not be able contribute community labour contribution to the project	Poor community members may not be included as project beneficiaries
		Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers	Conflict with regulations
		Risk of non-compliance to nature conservation regulations during implementation of project activities by contractors or project workers	Degradation of natural environment and landscape
		Risk of non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Conflict with regulations and local cultural norms  Cultural and religious conflicts among project workers and local communities
		Unhygienic and inadequate accommodation in labour camps for temporary labour from outside the project area may lead to health and safety of project workers	Impact on health and safety of project workers
		Increased waste from project activities and labour camps	Pollution of local water bodies and natural environment
		Risk of spreading pests and diseases within communities due to imported labour for project activities	Spreading of pests and diseases within communities

Outputs	Activities	Risks	Impacts
		Limited loss of vegetation due to land clearance during construction and establishment of camps for project activities	Minor degradation of forest natural forests
		Establishment of labour camps in culturally sensitive areas	Damage to physical cultural heritage
	Activity 2.2.3. Scale up micro-irrigation system (drip & sprinkler)	No risks foreseen	
	Activity 2.2.4. Tail water management	No risks foreseen	
Output 2.3: Innovative technologies for tapping water adopted	Activity 2.3.1. Promote and scale up solar/electric/manual water pump for irrigation (pumping from rivers, groundwater)	Excessive ground water abstraction may cause drop on water table during operation and management phases	Decrease inground water table and disturbance to hydrologic cycle
		safety risk associated with pump maintenance	Injury to workers in pump maintenance such as through electric shock
		Risk of spreading pests and diseases within communities due to imported labour for project activities	Spreading of pests and diseases within communities
	Activity 2.3.2. Build water harvesting structures or small-scale reservoirs to tap water for irrigation	Contamination water through collection surfaces	Health hazards
		Risk of spreading pests and diseases within communities due to imported labour for project activities	Spreading of pests and diseases within communities
Output 2.4: User groups in the community strengthened	Activity 2.4.1: Form and strengthen user groups in the community to promote local	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and	Unsustainable management of water resources and infrastructure

<b>Outputs</b>	<b>Activities</b>	<b>Risks</b>	<b>Impacts</b>
for effective management of irrigation and drinking water	ownership and sustainability of rural drinking water	inefficient management of water resources and infrastructure	
		COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place  Project activities may be delayed
		Weak capacity for climate resilient design and management of water sources and infrastructure	Increased risk of climate disasters causing damage to project output
	Activity 2.4.2: Form and strengthen user groups in the community to promote local ownership and sustainability of irrigation schemes	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure	Unsustainable management of water resources and infrastructure
		COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place  Project activities may be delayed
		Weak capacity for climate resilient design and management of water sources and infrastructure	Increased risk of climate disasters causing damage to project output
<b>Output 3.1</b> SLM in vulnerable and degraded areas implemented	Activity 3.1.1 Participatory SLM action planning to validate SLM interventions	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 3.1.2 Implementation of SLM measures – terracing (1000 Acres), contour	No risks foreseen	



<b>Outputs</b>	<b>Activities</b>	<b>Risks</b>	<b>Impacts</b>
	hedgerows (500 Acres) and landslide stabilization measures (20 Acres);		
	Activity 3.1.3: Technical assistance and support to communities on the implementation of SLM practices in the field (12 Nos)	No risks foreseen	
	Activity 3.1.4: Field-based and specialized training to farmers and agriculture extension staff on SLM technologies to enable them to respond to climate change induced risks and impacts with more competence and knowledge (300 Farmers);	No risks foreseen	
	Activity 3.1.5: Learning visits for extension officers on SLM & Climate Change (12 staff)	No risks foreseen	
	Activity 3.1.6: Monitoring and technical assistance to support communities in implementation of SLM and to see the work progress (12 Nos)	No risks foreseen	
	Activity 3.1.7: Documentation, Knowledge Management (KM)	No risks foreseen	

Outputs	Activities	Risks	Impacts
	and experience sharing platforms (3 Nos of workshops)		
Output 3.2: Climate change information, products and services made available and accessible	Activity 3.2.1: Agro-met advisory bulletins appropriately packaged and disseminated timely	No risks foreseen	
	Activity 3.2.2: Incorporation of area specific weather and crop data in ADSS	No risks foreseen	
	Activity 3.2.3: Capacity building of agro-met focal points based in ARDCs and Central Programs	No risks foreseen	
	Activity 3.2.4: Knowledge management and communication activities	No risks foreseen	
<b>Output 3.3</b> Agricultural disaster risk reduction and management mainstreamed	Activity 3.3.1 Initiation of Climate/ Field Schools to bring transformational change by enhancing response capacity to identified risks	No risks foreseen	
	Activity 3.3.2 Sensitization, awareness and capacity dev on agro-met services to researchers, extension and farmers	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 3.3.3 Development of crop suitability and feasibility maps	No risks foreseen	

<b>Outputs</b>	<b>Activities</b>	<b>Risks</b>	<b>Impacts</b>
Output 4.1: Institutional mechanisms in Local Governments strengthened for CCA and gender mainstreaming	Activity 4.1.1: Conduct sensitization workshop for LGs and communities on mainstreaming CCA and gender in local development plans, programs and activities related to drinking water, irrigation and SLM	COVID-19 pandemic protocols may restrict inclusive community consultations and participation ; Risk of ownership over project activities	Inclusive community consultations may not take place
	Activity 4.1.2: Conduct capacity development training for LGs on CCA investment and mainstreaming tools, frameworks and approaches;	COVID-19 pandemic protocols may travel activities	Project activities may be delayed
	Activity 4.1.3: Carry out M&E of CCA and gender mainstreaming in their plans, programs and activities	No risks foreseen	

## C2 Environmental and social risks of the project by AF and BT FEC principles

<b>No</b>	<b>Principles and Project risks</b>	<b>Triggered by</b>	<b>Impact</b>	<b>Likelihood</b>	<b>Significance</b>
1	COMPLIANCE WITH THE LAW				
1.1	Risk of delay in project activities due to delay in obtaining permissions and clearances for project activities	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1)	M	L	M
1.2	Risk of delay in project activities due to delay in obtaining consent to extract water from another local jurisdiction	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1)	M	M	M
1.3	Risk of delay because of need for compliance with COVID - 19 pandemic norms	Community consultations and sensitizations, Trainings and planning workshops ( Activities 1.1.2;	M	L	M

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
		1.2.2; 1.3.2; 4.1.2)			
1.4	Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
1.5	Will there be risk that project does not comply with pollution control laws	None			
1.6	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
	<b>OVERALL RATING ON COMPLIANCE WITH THE LAW</b>		M	M	M
2	ACCESS AND EQUITY				
2.1	Poor people will not have equal opportunities to be selected as project beneficiaries	None			
2.2	Women will not have equal opportunities to be selected as project beneficiaries	None			
2.3	Indigenous minority people will not have equal opportunities to be selected as project beneficiaries	None			
2.4	Poor people will not be able to access services supported by the project	None			
2.5	Women will not be able to access services supported by the project	None			

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
2.6	Indigenous minority people will not be able to access services supported by the project	None			
2.7	Disabled people will not be able to access services supported by the project	None			
2.8	Elderly people will not be able to access services supported by the project	None			
2.9	Buildings constructed by the project will not have access for disabled people	None			
	<b>OVERALL RATING ON ACCESS AND EQUITY</b>	<b>None</b>	<b>M</b>	<b>M</b>	<b>M</b>
3	<b>MARGINALIZED &amp; VULNERABLE GROUPS</b>				
3.1	Elderly people will experience negative impacts from the project	None			
3.2	Disabled people will experience negative impacts from the project	None			
3.3	Refugees or displaced people will experience negative impacts from the project	None			
3.4	Migrant workers will experience negative impacts from the project	None			
3.5	Children will experience negative impacts from the project	None			
3.6	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES	PES scheme development and implementation (Activity 1.2.4)	M	M	M

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
3.7	Vulnerable and marginalized groups may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities. Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labour force; with alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labour contribution to the project	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON MARGINALIZED &amp; VULNERABLE GROUPS</b>		<b>M</b>	<b>M</b>	<b>M</b>
4	<b>HUMAN RIGHTS</b>				
4.1	Implementation of the project will result in violation of human rights of any people?	None			
	<b>OVERALL RATING HUMAN RIGHTS</b>	<b>None</b>			
5	<b>GENDER EQUALITY &amp; WOMEN'S EMPOWERMENT</b>				
5.1	The project is designed by men who have not taken women's perspectives into consideration	None			
5.2	The project will result in an increased workload of tasks traditionally done by women	None			

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
5.3	Women will not have equal opportunities to participate and express their views on aspect of project implementation	Community consultations and sensitizations, Trainings and planning workshops ( Activities 1.1.1; 1.1.2; 1.2.1; 1.3.1;1.3.2; 2.4.1; 3.3.2; 4.1.1; 4.1.2)	M	M	M
5.4	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES	PES scheme development and implementation (Activity 1.2.4)	M	M	M
5.5	Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders	Community consultations and sensitizations, Trainings and planning workshops ( Activities 1.1.5; 1.3.5)			
5.6	Households characterized by women or divorcee headed or single parents may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON GENDER EQUALITY &amp; WOMEN'S EMPOWERMENT</b>		<b>M</b>	<b>M</b>	<b>M</b>
6	CORE LABOUR RIGHTS				
6.1	Women or vulnerable groups will not have equal opportunities for employment in project activities	None			
6.2	The project will employ local people in conditions that may not comply with labour laws	None			

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
6.3	Safety risk associated with pump maintenance such and injury or workers in pump maintenance from through electric shock	Ground water extractions (Activity 2.3.1)	L	L	L
6.4	Unhygienic accommodation and inadequate in labour camps for temporary labour from outside the project area may lead to health and safety of project workers	Construction and Rehabilitation of Drinking Water Schemes/ pressurized/closed irrigation systems/ (gravity)/ Re-engineering/ rehabilitation or improvement (Activity 2.1.1; 2.2.1;2.2.2)			
6.5	Temporary labour from outside the project area will have conflicts with the local population	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.2)	M	M	M
6.6	Temporary labour from outside the project area will create a risk of spreading HIV or other transmissible diseases	None			
6.7	Children could be employed in project activities in contravention of the labour laws	None			
	<b>OVERALL RATING ON CORE LABOUR RIGHTS</b>		<b>M</b>	<b>M</b>	<b>M</b>
<b>7</b>	<b>INDIGENOUS PEOPLES</b>				
7.1	Indigenous people will not be adequately consulted about the project	None			
7.2	Indigenous people will experience negative impacts on their traditional livelihoods	None			
7.3	Indigenous people will lose access to land or natural resources	None			



No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
7.4	Indigenous people will experience negative impacts on their traditional culture and way of life	None			
7.5	People who are not indigenous minority will come to live, work or visit indigenous community areas.	None			
	<b>OVERALL RATING ON INDIGENOUS PEOPLES</b>	<b>None</b>			
8	<b>INVOLUNTARY RESETTLEMENT</b>				
8.1	Some households will have reduced incomes because of loss of land	None			
8.2	Households will suffer negative impacts from having to move their homes	None			
8.3	Households will have reduced income because of loss of access to community land or common property resources	None			
8.4	Land acquisition will be carried out without adequate consultation with the land users	None			
8.5	Land users will have the right to compensation but there will be no funds to pay compensation	None			
8.6	Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land and on water distribution/allocation arrangements leading to delay in implementation of project activities	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1; 2.2.2)	L	L	L
	<b>OVERALL RATING ON INVOLUNTARY RESETTLEMENT</b>		<b>L</b>	<b>L</b>	<b>L</b>

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
9	<b>PROTECTION OF FORESTS &amp; NATURAL HABITATS</b>				
9.1	Challenges in material transport across long distance may lead to construction of haphazard development of access roads and degradation of natural environment and landscape	Construction activities for drinking and irrigation water infrastructure (Activity 2.1.1; 2.2.1)	M	L	M
9.2	Minor degradation of forest natural forests due to loss of vegetation through to land clearance during construction and establishment of camps for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	L	L
9.2	Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats	Implementation of watershed management and water source recharge activities (Activities 1.1.5; 1.2.4; 1.3.5; 2.1.1; 2.2.2)	L	M	M
9.3	Unproportionate diversion of water from natural streams for drinking and irrigation water supply	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
9.4	Project will result in increased hunting of protected species of wildlife	None			
9.5	Project will result in unsustainable increase in wild capture fishing	None			
9.6	Project will result in unsustainable increase in firewood collection or timber cutting	None			
9.7	Project will result in unsustainable increase in collection of non-timber forest products	None			

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
9.8	Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures	Watershed management, PES and water source recharge activities (Activities 1.1.5; 1.2.4; 1.3.5; 2.2.1)	M	L	M
9.9	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	L	M
	<b>OVERALL RATING ON PROTECTION OF FORESTS &amp; NATURAL HABITATS</b>		<b>M</b>	<b>M</b>	<b>M</b>
10	<b>CONSERVATION OF BIOLOGICAL DIVERSITY</b>				
10.1	Project will damage areas that are important for biodiversity	None			
10.2	Changed farming practices will reduce biodiversity	None			
10.3	Project will result in drainage of wetlands or natural water bodies	None			
10.4	Introduction of Alien Invasive Species (AIS) due to imported planting materials for watershed restoration	Implementation of watershed management and water source recharge activities (Activities 1.1.5; 1.2.4;1.3.5)	M	L	M
10.5	Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats	Implementation of watershed management and water source recharge activities (Activities 1.1.5;1.3.4)	L	M	M
	<b>OVERALL RATING ON CONSERVATION OF BIOLOGICAL</b>		<b>M</b>	<b>M</b>	<b>M</b>

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
	<b>DIVERSITY</b>				
11	<b>CLIMATE CHANGE</b>				
11.1	The project supports activities that will not be sustainable because of climate change	None			
11.2	Weak capacity for climate resilient design and management of water sources and infrastructure could lead to increased risk of climate disasters causing damage to project output	Conducting capacity building for LGs on CCA tools, frameworks and approaches (Activity 2.4.1;2.4.2)	M	M	M
11.3	Project will result in increased greenhouse gas emissions	None			
11.4	Drinking water shortages in project areas as a result of temporal variation in water supply at source caused by to climate change	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
	<b>OVERALL RATING ON CLIMATE CHANGE</b>		<b>M</b>	<b>M</b>	<b>M</b>
12	<b>POLLUTION PREVENTION &amp; RESOURCE EFFICIENCY</b>				
12.1	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure	Formation and strengthen user groups in the community to promote local ownership and sustainability of rural water and irrigation schemes (Activity 2.4.1; 2.4.2)	M	M	M
12.2	Project will cause a long-term increase in air pollution that is harmful to human health	None			
12.3	Project will cause a long-term increase in air pollution that is not	None			

<b>No</b>	<b>Principles and Project risks</b>	<b>Triggered by</b>	<b>Impact</b>	<b>Likelihood</b>	<b>Significance</b>
	harmful to human health				
12.4	Project will cause increased use of agriculture chemicals	None			
12.5	Project will result in a risks from hazardous chemicals	None			
12.6	Project will result in long-term increase in flows of polluted water	None			
12.7	Generation of solid and liquid wastes from project activities at construction sites and labour camps that can lead to pollution of local water bodies and natural environment	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
12.8	Project will cause short-term environmental damage (e.g. during construction)	None			
12.9	Project will cause non-sustainable increase in extraction of groundwater	None			
12.10	Project will cause non-sustainable extraction or diversion of water from a surface water source	None			
12.11	Project will cause non-sustainable increase in mineral extraction	None			
12.12	Minor pollution of soils and surface water at project activity sites due to generation of solid and liquid wastes, especially during the rainy season	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
12.13	Disruption of temporary access to water may cause disruption is agriculture activities and reduced production diversion of water during construction and rehabilitation of irrigation water supply infrastructure	Construction and Rehabilitation of irrigation Water Supply Schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
12.14	Long distance and terrain between water source and end user catchment may render Infrastructure for water supply inefficient due to leakages, inadequate water volume and inappropriate water pressure	Construction of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	M	M	M
	<b>OVERALL RATING ON POLLUTION PREVENTION &amp; RESOURCE EFFICIENCY</b>		<b>M</b>	<b>M</b>	<b>M</b>
13	<b>PUBLIC HEALTH</b>				
13.1	Public health hazards through contamination of water through collection surfaces of rain water harvesting structures	Rain water harvesting (Activity 2.3.2)	M	M	M
13.2	ProJet will result in increased use of harmful substances (e.g. alcohol)	None			
13.3	Project will cause people to change to less healthy or nutritious diets	None			
13.4	In increased transmission of diseases within communities due to imported labour for project activities	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 1.1.5; 1.2.4; 2.1.1; 2.2.1; 2.2.2; 2.3.1; 2.3.2)	M	M	M
13.5	Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure	Construction activities for drinking water supply and rehabilitation works (Activity 2.1.1; 2.2.1; 2.2.2)	M	M	M
	<b>OVERALL RATING ON PUBLIC HEALTH</b>		<b>M</b>	<b>M</b>	<b>M</b>
14	<b>PHYSICAL AND CULTURAL RESOURCES/HERITAGE</b>				

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
14.1	Damage to physical cultural heritage due to establishment of labour camps in culturally sensitive areas	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	M	L	M
14.2	Project will cause loss of non-physical cultural heritage	None			
14.3	Project will change the appearance of any place that is famous for its natural beauty	None			
14.4	Cultural and religious conflicts from non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1; 2.2.2)	L	M	M
	<b>OVERALL RATING ON PHYSICAL AND CULTURAL RESOURCES/HERITAGE</b>		<b>M</b>	<b>M</b>	<b>M</b>
15	<b>LANDS AND SOIL CONSERVATION</b>				
15.1	Clearing of trees or other vegetation could cause soil erosion	None			
15.2	Minor soil erosion and land degradation in project activity sites due to disturbance to topsoil created by machineries, trucks and construction materials	Construction and Rehabilitation of Drinking Water Supply Schemes and irrigation schemes (Activity 2.1.1; 2.2.1)	L	M	M
15.3	Changed water flows (e.g. from road drainage or river works) could cause soil erosion	None			
15.4	Project can cause damage to any sensitive landscape	None			
	<b>OVERALL RATING LANDS AND SOIL CONSERVATION</b>		<b>L</b>	<b>M</b>	<b>M</b>

### C3 ESS Risk Screening and Project risk categorization

Principles on Human Rights, Indigenous People and Transboundary issues are not triggered through the participatory risk assessment. Project categorization has been done based on significance of risks on the 16 principles that have been triggered.

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
1	<b>OVERALL RATING ON COMPLIANCE WITH THE LAW</b>	Risk of delay in project activities due to delay in obtaining permissions and clearances, delay in obtaining consent to extract water from another local jurisdiction; Risk of delay because of need for compliance with COVID - 19 pandemic norms; Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers; Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations. ((Activities 1.1.1;1.1.4; 1.1.2; 1.2.1;1.2.2; 1.2.4; 1.3.1;1.3.2; 1.3.3; 1.4.1; 3.1.1; 4.1.1; 4.1.3; 4.2.2; 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	M	M	M
2	<b>OVERALL RATING ON ACCESS AND EQUITY</b>	None	M	M	M
3	<b>OVERALL RATING ON MARGINALIZED &amp; VULNERABLE GROUPS</b>	Lack of inclusive community participation in PES scheme development could lead to unequal benefits from PES; Vulnerable and marginalized groups may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities; Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labour force; with	M	M	M



No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
		alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute community labour contribution to the project ( (Activity 1.2.4; 2.1.1; 2.2.1; 2.2.2)			
4	<b>OVERALL RATING ON HUMAN RIGHTS</b>	<b>None</b>			
5	<b>OVERALL RATING ON GENDER EQUALITY &amp; WOMEN'S EMPOWERMENT</b>	Women will not have equal opportunities to participate and express their views on aspect of project implementation; Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES; Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders; Households characterized by women or divorcee headed or single parents may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities (( Activities 1.1.1;1.1.4; 1.1.2; 1.2.1;1.2.2; 1.2.4; 1.3.1;1.3.2; 1.3.3; 1.4.1; 3.1.1; 2.1.1; 2.2.1; 2.2.2 4.1.1; 4.1.3; 4.2.2)	<b>M</b>	<b>M</b>	<b>M</b>
6	<b>OVERALL RATING ON CORE LABOUR RIGHTS</b>	Safety risk associated with pump maintenance such and injury or workers in pump maintenance from through electric shock; Temporary labour from outside the project area will have conflicts with the local population (Activity 2.1.1; 2.2.2; 2.3.1)	<b>M</b>	<b>M</b>	<b>M</b>
7	<b>OVERALL RATING ON</b>	<b>None</b>			

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
	<b>INDIGENOUS PEOPLES</b>				
8	<b>OVERALL RATING ON INVOLUNTARY RESETTLEMENT</b>	Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land and on water distribution/allocation arrangements leading to delay in implementation of project activities (Activity 2.1.1; 2.2.1; 2.2.2)	<b>L</b>	<b>L</b>	<b>L</b>
9	<b>OVERALL RATING ON PROTECTION OF FORESTS &amp; NATURAL HABITATS</b>	Challenges in material transport across long distance may lead to construction of haphazard development of access roads and degradation of natural environment and landscape; Minor degradation of forest natural forests due to loss of vegetation through to land clearance during construction and establishment of camps for project activities; Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats; Unproportionate diversion of water from natural streams for drinking and irrigation water supply; Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures; Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations (Activity 1.1.5;1.3.4; 1.2.4; 2.1.1; 2.2.1; 2.2.2; 2.3.1; 2.3.2;2.3.3; 2.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
10	<b>OVERALL RATING ON CONSERVATION OF BIOLOGICAL DIVERSITY</b>	Introduction of Alien Invasive Species (AIS) due to imported planting materials for watershed restoration; Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats (Activities 1.1.5;1.3.4)	<b>M</b>	<b>M</b>	<b>M</b>

No	Principles and Project risks	Triggered by	Impact	Likelihood	Significance
11	<b>OVERALL RATING ON CLIMATE CHANGE</b>	Weak capacity for climate resilient design and management of water sources and infrastructure could lead to increased risk of climate disasters causing damage to project output; Drinking water shortages in project areas as a result of temporal variation in water supply at source caused by to climate change (Activity 2.1.1; 2.2.1;4.1.2)	<b>M</b>	<b>M</b>	<b>M</b>
12	<b>OVERALL RATING ON POLLUTION PREVENTION &amp; RESOURCE EFFICIENCY</b>	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure; Generation of waste from project activities and labour camps that can lead to pollution of local water bodies and natural environment; Minor pollution of soils and surface water at project activity sites due to generation of solid and liquid wastes, especially during the rainy season; Disruption of temporary access to water may cause disruption in agriculture activities and reduced production due to diversion of water during construction and rehabilitation of irrigation water supply infrastructure; Long distance and terrain between water source and end user catchment may render water supply infrastructure inefficient due as a result of to leakages, inadequate water volume and inappropriate water pressure (Activity 2.1.1; 2.2.1; 2.2.2; 2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4; 4.2.1)	<b>M</b>	<b>M</b>	<b>M</b>

<b>No</b>	<b>Principles and Project risks</b>	<b>Triggered by</b>	<b>Impact</b>	<b>Likelihood</b>	<b>Significance</b>
13	<b>OVERALL RATING ON PUBLIC HEALTH</b>	Public health hazards through contamination of water through collection surfaces of rain water harvesting structures; Increased transmission of diseases within communities due to imported labour for project activities; Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure (Activity 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2; 2.3.3; 2.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
14	<b>OVERALL RATING ON PHYSICAL AND CULTURAL RESOURCES/ HERITAGE</b>	Damage to physical & cultural heritage due to establishment of labour camps in culturally sensitive areas; Cultural and religious conflicts from non-compliance to local cultural norms during implementation of project activities by contractors or project workers (Activity 2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	<b>M</b>	<b>M</b>	<b>M</b>
15	<b>OVERALL RATING LANDS AND SOIL CONSERVATION</b>	Minor soil erosion and land degradation in project activity sites due to disturbance to topsoil created by machineries, trucks and construction materials (2.1.1; 2.2.1; 2.2.2;2.2.3; 2.3.1; 2.3.2;2.3.3; 2.3.4)	<b>L</b>	<b>M</b>	<b>M</b>
	<b>Overall Project Risk Category</b>	B (Most project risks are minor, site specific and manageable)	<b>M</b>	<b>M</b>	<b>N</b>

#### D. Project level ESMP

The project level ESMP has been developed through participatory identification of mitigation measures for each risk identified within the sixteen principles that have been triggered. Hence the ESMP does not include principles on Human Rights (principle 4), Indigenous People (Principle 7 and Transboundary issues (Principle 19).

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
1	COMPLIANCE WITH THE LAW						
1.1	Risk of delay in project activities due to delay in obtaining permissions and clearances for project activities	Roles and responsibilities for agency and social clearance to be mapped out and agreed by stakeholders prior to project implementation through inclusive consultation; Stakeholder engagement plan to detail this out	PMU	Q1	Stakeholder engagement plan and role or agencies at local and national level clarified	400000	Nu. 100,000/dz for consultations
1.2	Risk of delay in project activities due to delay in obtaining consent to extract water from another local jurisdiction	Study on local water source sharing & water related dispute management mechanisms  Ensure inclusive consultations and consent on use and sustainable management of common water sources or for extraction of raw materials prior to project implementation	Dzongkhags	Q2	Study report that identifies mechanisms for water source sharing & water related dispute management	1,227,000	30 days of national consultant @ US\$ 350/day plus 3 one regional workshop estimated at Nu. 450000(lumpsum)

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
1.4	Risk of non-compliance to labour laws during implementation of project activities by contractors or project workers	Awareness on labour laws to contractors and their field supervisors  Provide a grievance mechanism for workers to raise workplace concerns	Contractors & Site supervisors	Through out project implementation	Grievance reports	40000	Nu. 100,000/dz for awareness
1.5	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations	Awareness on nature conservation regulations and local cultures and norms to contractors and their field supervisors  Provide a grievance mechanism for local communities to raise concerns of non-compliance to nature conservation regulations by project workers	CFO	Through out project implementation	Grievance reports Penalties	0	Included in project activity
2	ACCESS AND EQUITY						
3	MARGINALIZED & VULNERABLE GROUPS						
3.6	Lack of inclusive community participation in PES scheme development leading to unequal	Ensure inclusive participation by women headed households in consultations for PES scheme development	CFO	PES planning	Stakeholder engagement plan	0	Planned in the project

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
	benefits from PES						
3.7	Vulnerable and marginalized groups may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities. Vulnerable and marginalized groups and individuals (households characterize by - isolated and dotted settlements without motorable access road; with only elderly members & without households labour force; with alcoholic heads; less household members; Empty or no resident members; women and divorcee headed) may not be able contribute	Prioritize award of project works on contractual arrangements during project implementation period and ensure water management guidelines and norms are included in the by-laws of the location specific Water Users Associations	PMU and Dzongkhag	Project implementation period	WUA bylaws; Unskilled labour works included in award of project contracts	0	Project activity would cover the cost

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
	community labour contribution to the project						
5	GENDER EQUALITY & WOMEN'S EMPOWERMENT						
5.3	Women will not have equal opportunities to participate and express their views on any aspect of project implementation	Ensure inclusive participation by women and men in consultations	PMU	Project implementation period	30 percent women participation in all project consultations	0	Project activity would cover the cost
5.4	Lack of inclusive community participation in PES scheme development leading to unequal benefits from PES	Ensure inclusive participation by women and men in consultations for PES scheme development	CFO	PES planning	30 percent women participation in PES consultations	0	Project activity would cover the cost
5.5	Lack of awareness on project activities and plans leading to weak project ownership by local stakeholders	Adequate awareness and sensitization through public consultations; Prior informed community consent before project implementation;	PMU	Year 1	No of awareness workshop	400000	100000/Dzongkhag for Workshops on project introduction, planning and review



No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
5.6	Households characterized by women or divorcee headed or single parents may not be included as project beneficiaries if the project considers communities to provide unskilled labour for project activities	Prioritize award of project works on contractual arrangements during project implementation period and ensure water management guidelines and norms are included in the by-laws of the location specific Water Users Associations	PMU and Dzongkhag	Project implementation period	WUA bylaws; Unskilled labour works included in award of project contracts	0	Project activity would cover the cost
6	CORE LABOUR RIGHTS						
6.3	Safety risk associated with pump maintenance such and injury or workers in pump maintenance from through electric shock	Ensure sue of safe pumping equipment	Dzongkhag Engineer	Construction phase	Technical Design document	0	Project activity would cover the cost
6.4	Unhygienic and inadequate accommodation in labour camps for temporary labour from outside the project area may lead to health and safety of project workers	Ensure compliance with Regulations on Occupational Health, Safety (OHS) and Welfare (MoLHR) and Regulations on Occupational Health and Safety for Construction Industry (MoLHR)	Contractors & Site supervisors	Construction phase	Clause on OHS in contractual agreement	0	

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
		Ensure compliance to Covid 19 pandemic protocols					
6.5	Temporary labour from outside the project area will have conflicts with the local population	<p>Ensure compliance with Regulations on Occupational Health, Safety and Welfare (MoLHR) and Regulations on Occupational Health and Safety for Construction Industry (MoLHR)</p> <p>Provide a grievance mechanism for project workers to raise health and safety concerns</p>	Contractors	Construction phase	<p>Compliance to OHS regulations and Covid 19 pandemic norms included in project contractual deeds</p> <p>Grievance reports</p> <p>Penalties</p>	0	
8	INVOLUNTARY RESETTLEMENT						

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
8.6	Minor disputes may arise among local communities and institutions on alignment of water conveyance lines through private land and on water distribution/allocation arrangements leading to delay in implementation of project activities	Adequate awareness and sensitization through public consultations; Free and prior informed community consent before project implementation; Acceptable layout plan to be considered through community consultations such as underground layout of pipe lines, using existing right of way, to the maximum extent possible; Water allocation mechanisms and management responsibilities to be clarified in the WUA governance framework	Dzongkhags	Before site specific drinking water and irrigation alignment/water allocation plans are finalized	FPIC on site specific plans	600000	NU. 150000/dz for FPIC site specific FPIC process
9	PROTECTION OF FORESTS & NATURAL HABITATS						
9.1	Challenges in material transport across long distance may lead to construction of haphazard development of access roads and degradation of natural	Ensure that any access facilities within the project areas are based on consent of local communities and based on environmental clearance from the Dzongkhag. Project will not finance	Dzongkhag Engineer	Construction phase	Environment clearance certificate from Dzongkhag for project activity	0	

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
	environment and landscape	road constrictions.					
9.2	Minor degradation of forest natural forests due to loss of vegetation through to land clearance during construction and establishment of camps for project activities	Minimize cleared area	Contractor	Construction phase	Environment clearance certificate from Dzongkhag for camp site development	0	
9.2	Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats	Create alternate water holes within proximity of existing (restricted) water holes	CFO	Project implementation period	No of alternative water holes created	400000	lumpsum of 100,000/Dz for creation of alternative water holes in watershed protection areas
9.3	Unproportionate diversion of water from natural streams for drinkling and irrigation water supply	Maintain environmental flow required by the environmental clearance of the project	Dzongkhag Engineer	Planning and design phase	Environment clearance certificate from Dzongkhag for project activity	0	

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
9.8	Change in livestock practices due to restriction in grazing areas for water source protection and conservations measures	Commonly agreed alternatives should be planned prior to project start	PMU	year 1	Commonly agreed alternative for catchments areas that form part of grazing included in project implementation plan	600000	lumpsum of Nu. 150000/dzo ngkhag for promoting and adopting alternatives for grazing in catchment areas
9.9	Degradation of natural environment and landscape through rampant collection NWFPs, firewood, medicinal; plants, fishing or hunting of wildlife and non-compliance to nature conservation regulations	Awareness on nature conservation regulations and local cultures and norms to contractors and their field supervisors  Provide a grievance mechanism for local communities to raise concerns of non-compliance to nature conservation regulations by project workers	PMU	year 1	No. of awareness workshop; No of grievance by local communities		Budgeted under 14.4
10	CONSERVATION OF BIOLOGICAL DIVERSITY						

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
10.4	Introduction of Alien Invasive Species (AIS) due to imported planting materials for watershed restoration	Limit planting materials to use local planting materials and indicator species	CFO	Project implementation period	0 import of planting materials	0	
10.5	Disturbance to wildlife in the form or restricting access to water holes, disturbance to natural habitats	Create alternate water holes within proximity of existing (restricted) water holes	CFO	Project implementation period	No of alternative water holes created	0	Project activity would cover the cost
11	CLIMATE CHANGE						
11.2	Weak capacity for climate resilient design and management of water sources and infrastructure could lead to increased risk of climate disasters causing damage to project output	Provide adequate training to WUA members and local officials on climate resilient design for irrigation and drinking water infrastructure, CCA and embed roles for maintenance and monitoring in the WUA governance and management framework	PMU	Year 1	Number of trainings; training content for CCA covers climate resilient design and management of irrigation and drinking water; Number of participants	0	Planned in the project
11.4	Drinking water shortages in project areas as a result of temporal variation in	Integrate adequate storage in the design to tide over temporal reduction in water supply at source	Dzongkhag Engineer	Planning and design phase	Water storage reservoirs included in the design	0	Part of the project plan

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
	water supply at source caused by to climate change						
12	POLLUTION PREVENTION & RESOURCE EFFICIENCY						
12.1	The lack of formal registration of WUAs and absence of their legal status could lead to unsustainable and inefficient management of water resources and infrastructure	Ensure that WUGs are established at the community, Gewog and at spring shed levels; That they are registered at the Gewog and Dzongkhag with adequate governance framework; Provide trainings to members on water management, infrastructure maintenance and on catchment management and protection; Budget for WUA functioning to be included in the Gewog budget	Dzongkhag Engineer, Dzongkhag Agriculture Officer	Project implementation period	List of formally registered WUA and their bylaws; WUA budget in Gewog budget	0	Included in project activity

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
12.7	Generation of waste from project activities and labour camps that can lead to pollution of local water bodies and natural environment	<p>Ensure that there are appropriate and separate areas for toilets, washing areas</p> <p>Make arrangements for environment friendly toilet and washing facilities in each camp site;</p> <p>Ensure that camps sites are located away from existing stream, river, water source and no discharge from such establishments should follow their path into nearby water bodies.</p> <p>Waste management plan for project site and labour camps to developed and implemented in accordance with Waste Management Act and its Regulations and as per FNCR, 2017, rule no. 49 (2);</p> <p>Avoiding sensitive sites,</p>	Contractor	Construction phase	Compliance to OHS regulations and Covid 19 pandemic norms included in project contractual deeds	0	Contractor cost



No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
		such as those which include steep hillsides, and areas erosive in nature for labour camps  Use of mechanized construction methods to reduce waste in construction					
12.12	Minor pollution of soils and surface water at project activity sites due to generation of solid and liquid wastes, especially during the rainy season	Prepare waste management plan for safe disposal of wastes  Avoid dumping and burial of wastes in permeable soils, or water courses and near water supply sources	Contractors & Site supervisors	Construction phase	ESMP Compliance Monitoring report; Grievance report	0	Costed under Safeguards expert
12.13	Disruption of temporary access to water may cause disruption is agriculture activities and reduced production diversion of water during construction and rehabilitation of irrigation water supply infrastructure	Inform potentially affected communities in advance and make alternative arrangements for longer duration of disruption	Dzongkhag Engineer	Construction phase	ESMP Compliance monitoring report; Grievance report	0	Costed under Safeguards expert

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
12.14	Long distance and terrain between water source and end user catchment may lead render Infrastructure may be render water supply infrastructure inefficient due due to leakages, inadequate water volume and inappropriate water pressure	Ensure appropriate water pressure management, size of pipes, size and location of storage tanks and slope of water pipe alignment as well as robust support structures along the conveyance	Dzongkhag Engineer	Plannin g and design phase	Technical Design document	0	Project activity would cover the cost
14	PUBLIC HEALTH						
13.1	Public health hazards through contamination of water through collection surfaces of rain water harvesting structures	Integrate water purification to in rain water harvesting for drinking water	Dzongkhag Engineer	Plannin g and design phase	Water purification included in the design for rain water harvesting structure	0	Project activity would cover the cost
13.4	In increased transmission of diseases within communities due to imported labour for project activities	Ensure compliance with Regulations on Occupational Health, Safety (OHS) and Welfare (MoLHR) and Regulations on Occupational Health and Safety for Construction Industry	Contractors	During all contract ual tenderin g process	Compliance to OHS regulations and Covid 19 pandemic norms included in project contractual deeds	0	Costed under Safeguards expert

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
		(MoLHR)  Ensure compliance to Covid 19 pandemic protocols					
13.5	Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure	Disruption of temporary access to water may cause health and sanitation issues to end users due to rehabilitation or construction of drinking water supply infrastructure	Contractors & Site supervisors	Construction phase	ESMP Compliance monitoring report / Grievance reports	0	Costed under Safeguards expert
14	PHYSICAL AND CULTURAL RESOURCES/HERITAGE						
14.1	Damage to physical cultural heritage due to establishment of labour camps in culturally sensitive areas	Site selection of labour camps to avoid sensitive areas through consultation with community leaders	Contractor	Construction phase	Record of consultation with community leaders for camp site location	0	Contractor cost

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
14.4	Cultural and religious conflicts from non-compliance to local cultural norms during implementation of project activities by contractors or project workers	Awareness on nature conservation regulations and local cultures and norms to contractors and their field supervisors  Provide a grievance mechanism for local communities to raise concerns of non-compliance to nature conservation regulations by project workers	CFO	Through out project implementation	Grievance reports Penalties	400000	100000/Dzongkhag for awareness workshops on regulations and norms
15	LANDS AND SOIL CONSERVATION						
15.1	Clearing of trees or other vegetation could cause soil erosion	Provide a grievance mechanism for local communities to raise concerns of non-compliance to nature conservation regulations by project workers	CFO	Through out project implementation	Grievance reports Penalties	0	Budgeted under 14.4
15.2	Minor soil erosion and land degradation in project activity sites due to disturbance to topsoil created by machineries, trucks and construction materials	Minimize area to be for cleared and restore backfilling of land, ditches and pits and ensure organized management of materials at site; Initiate sustainable land management techniques in	Contractors & Site supervisors	Construction phase	ESMP Compliance monitoring report	0	Contractor cost

No	Principle and Project risks	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)	Remarks on budget
		areas prone to erosion					
16	POVERTY ALLEVIATION						
	Total budget (Nu)					4,067,000	
	Total budget (US \$) @ 1 USD=Nu. 74					54,959	

E. Overall cost for Environment and Social Safeguards

No	Cost items	Total amount (US\$)
1	Cost of environmental and Safeguards and Gender Expert (40 days per year @ USD 350 per day for 5 years)	6,000
2	Cost of trainings, orientations, awareness programs and information dissemination as indicated in the ESMP	54959
3	Training of Dzongkhag Engineers, Dzongkhag Environment Officers, Dzongkhag Gender Focal Person and Gewog Administrator (30 officials) @ US\$ 1500 per dzongkhag	6000
3	Travel expenses for the ESS Expert (15 days per year@US\$ 150 per day including transport)	11250
	Total cost of ESS	78,209

## F **Grievance Redress Mechanism (GRM) and Process for the project**

Due to the large number of stakeholders, especially the communities living within the project areas, a Grievance Redress Mechanism (GRM) that effectively collects and responds to stakeholders' concerns, suggestions and complaints is necessary as an integral part of the project. It will provide a platform and access for all affected stakeholders to lodge project implementation issues and complaints and ensure unbiased confidentiality, responsiveness and accountability to their complaints. It takes into account the availability of customary dispute settlement mechanisms among the communities as for judicial recourse.

The GRM aims to provide people who suffer adverse impacts from the project activities an opportunity to be heard and be assisted. Any affected party may file a complaint directly or through a representative with concrete evidence of authority to represent them. While anonymous complaints will not be considered, complainants can request confidentiality.

The objective of establishing GRM is to provide an effective and efficient mechanism for settlement of conflicts or grievances and to adopt measures to ensure an expeditious settlement of grievances relating to the project activities leading to effective implementation of the project. The GRM has been proposed based the following seven core principles to be adhered while dealing with grievances for its resolution.

1. ***Fairness:*** Grievances are assessed impartially and handled transparently.
2. ***Objectiveness and independence:*** The GRM operate independently of all interested parties in order to guarantee fair, objective, and impartial treatment to each case.
3. ***Simplicity and accessibility:*** Procedures to file grievances and seek action are simple enough that project beneficiaries can easily understand them.
4. ***Responsiveness and efficiency:*** The GRM is designed to be responsive to the needs of all complainants.
5. ***Speed and proportionality:*** All grievances, simple or complex, are addressed and resolved as quickly as possible in a constructive manner.
6. ***Social inclusion:*** Special attention is given to ensure that poor people and marginalized groups, including those with special needs, are able to access the GRM.
7. ***Accountability:*** Each grievance reported are, resolved or escalated to the next higher level till its resolution and proper records are maintained at each level. Progress reporting of project activities should include a reporting on grievance resolution.

It is in the interest of the project as well as the stakeholders involved for the smooth implementation of its activities. Hence, any issues, conflicts, or grievances arising out of project activities must be adequately addressed.

The GRM for the project will comprise of the following process;

### **(1) Receipt and Register Grievances**

Any grievances related to the project activities can be reported through the concerned Tshogpa, Gewog Administration, or other authorities for its resolution to the Gewog Dzingsel Tshogpa (Gewog Dispute Resolution Committee). The channel for grievances submission can be either personal submission or through mail, e-mail, telephone, project staff or text messaging/SMS. Such submission should be recorded in writing at the Gewog.

Alternatively, any member of the Gewog Administration or officials associated with the project, its vendors/suppliers, other stakeholders and the public at large could also can lodge complaints on the website of the BT FEC (<https://www.bhutantrustfund.bt/lodge-complaint>). These complaints could relate to:

- a. Allegations of Fraud, Malpractices or Corruption related to the project activities
- b. Environmental and/or Social damages/harms caused by project activities as may be related to;
  - Compliance with laws, regulations and norms
  - Access and equity issues
  - Issues related to marginalized and vulnerable groups
  - Human Rights
  - Gender equality and women's empowerment
  - Core labour rights
  - Involuntary resettlement
  - Protection of forests and natural habitats
  - Conservation of biological diversity
  - Climate change
  - Pollution prevention and resource efficiency
  - Public health
  - Physical and cultural resources/heritage
  - Lands and soil conservation
  - Poverty alleviation
  - Disaster management capability
  - Pests and diseases management
  - Transboundary issues

It would be preferable that the complainant, provide some contact details so that concerned authorities can contact the person for additional information, if required during investigation. However, where feedback is not required by the complainants, they may choose not to provide such details.

## **(2) Sorting and Processing**

It is anticipated that various types of grievances will be reported wherein different follow-up actions will be required. The grievances can be categorized into four types: (a) comments, suggestions, or queries; (b) complaints relating to non-performance of the project; (c) complaints referring to violations of law and/or corruption while implementing the project activities; (d) complaints against authorities, officials or community members involved in the project management; and (e) any complaints/issues not falling in the above categories. The Gewog Administration will maintain a record of complaints by the above categories as and when such grievances are received.

### **(3) Acknowledgment and Follow-up**

When a complaint is made or the grievance is reported, the Gewog office receiving the complaint or grievances should acknowledge its receipt and should brief the complainant, informer or aggrieved/affected person about the grievance resolution process, provide contact details and, if possible, the name of the contact person who is responsible for handling the grievance.

### **(4) Verification, Investigation, and Action**

The concerned Gewog Administration receiving the grievance should gather adequate information about the grievance reported to determine its validity and resolving the grievance. Grievances that are straightforward (such as queries and suggestions) can be resolved quickly by contacting the complainant. Grievances that cannot be resolved by grievance receiving authorities/office at their level should be referred to a higher level for verification and further investigation. The concerned authorities/offices dealing with investigation should ensure that the investigators are neutral and do not have any stake in the outcome of the investigation. The grievance redressal will be as follows:

- (a) If Gewog Administration receives the grievance from the aggrieved/affected individuals or communities, The Gewog Dzingsel Tshogpa shall try to resolve grievances within 7 working days by negotiating and mediating between the affected parties if the grievance is of such nature that Gewog Dzingsel Tshogpa can resolve it. However, any grievances warranting sanctions for violation of statutes shall not be negotiated by the Tshogpa but rather inform the concerned authorities/offices empowered to impose such sanctions and such report should be copied to the Dzongkhag Administration. In the event, the parties are not satisfied with the decision from such arrangements, the parties shall submit appeal to the Dzongkhag Administration directly with copies to the PCU and BTFEC.
- (b) Upon receipt of grievance appeal the Dzongkhag Dzingsel Tshokpa (Dzongkhag Dispute Resolution Committee) shall verify and investigate, if necessary, and render its decision within 15 working days. In the event, the parties are not satisfied with the decision of the Tshokpa, the parties shall submit appeal to BTFEC.
- (c) Upon receipt of grievance appeal from the Dzongkhag, the BTFEC shall activate the Complaint Management Committee of BTFEC who will pursue face to face resolution or provide a mediated resolution in the case of administrative cases or refer to the Board of BTFEC in the case of major cases. Where the Board is not able to resolve the case, it shall be forwarded to the Anti-Corruption Commission of Bhutan by the BTFEC. The BTFEC shall verify and investigate and render its resolution within 15 working days.
- (d) In the event, the parties are not satisfied with the decision of the Dzongkhag GRC, the parties can also alternatively submit their grievances to the Court of Law for further adjudication as per court procedures.

### **(5) Monitoring and Evaluation**

The grievances should be monitored to track and assess the extent to which progress is being made to resolve them. The grievance data can be analyzed and



evaluated to make policy and/or process changes to minimize similar grievances in the future. Record of each grievance submitted and its resolution should be considered as part of the progress reporting of the project activities.

## **G Capacity Building for environmental and social safeguards**

The Gewogs would need technical support and capacity enhancement on social safeguards while the project official (Dzongkhag Engineers and Environment Officers) will need such capacity for both environmental and social safeguards. To provide technical assistance and support, a neutral Safeguards and Gender Expert is recommended to be recruited by the Project at the for 30 days per year. The expert will provide support to all the project Dzongkhags and Gewogs on environment assessment for all field specific activities, preparation of location and activity specific ESMPs (where necessary), monitoring of compliance and in reporting on overall safeguards to the PCU, Competent Authorities and to the NECs (See Annex 1 for ToR of the SGE).

One of the elements that contribute to environmental clearances and hence environmental and social safeguards is the community clearance. For informed consent to be achieved the issuance of community clearances should be based on a sound understanding of the impacts to the local environment and the communities (informed consent) before activities actually are implemented (prior consent). For this prior informed consent to happen, the representatives of the right holders should be fairly educated and trained in delivering prior informed consent. The representatives of the rights holders are mostly the Chair of CF or NWFP groups, Tshogpa and the Gup at the grassroots level. Therefore, the following areas of capacity have been recommended for the representatives of the rights holders at the grass roots level in the project areas;

- The Concept of HVCAs and how forest lands outside PAs and BCs will be managed
- Capacity for environmental and social impacts assessment
- Participatory decision-making process and facilitation
- Conflict resolution and management

## **7.2 EES Compliance Monitoring of Project Activities**

The compliance of project activities with the ESS plan will be monitored by various entities at different stages of preparation and implementation as follows.

### *Monitoring at the project level.*

The overall responsibility for implementing the ESS and for monitoring the compliance of the project's environmental safeguard activities lies with the PMU at the GNHC. The Safeguards and Gender Expert (SGE) at the PMU shall oversee implementation of field activities relating to ESS and coordinate with the project Dzongkhags. He/she will be responsible for overall monitoring of compliance and in reporting on overall safeguards to the Project Manager who will report to Competent Authorities. The ESS compliance monitoring will also include grievances that are reported through the Grievance Redress Mechanism (GRM) and on the status of redressal of grievances reported. The grievance data should be analysed and

evaluated to make policy and/or process changes to minimize similar grievances in the future. Record of each grievance that has been reported and its resolution must be recorded and reported in the progress reporting of project activities.

*Monitoring at the field activity level:*

Self-regulatory monitoring should be adopted by the concerned Dzongkhags. The terms and conditions included in the environment clearances for project activities must be taken care of during the implementation of individual field activities. Self-monitoring reports by the Dzongkhag Environment Officers should be filed to the PCU on a quarterly basis and should be liable for ad-hoc inspection by the PMU or any Competent Authority.

The Dzongkhags shall be responsible for supervision of environmental compliance by the service providers for the project activities as and when they are involved or by the concerned communities as the case may be. Environmental and social mitigation measures carried out by these parties should be verified by the Dzongkhag Engineers with support from the Dzongkhag Environment Officers and must be documented. Disbursements of project activity funds by the PMU should be linked to satisfactory compliance to ESMP of specific activities.

## **H DISCLOSURE**

The stakeholders of the project and affected communities will be informed about the ESMP requirements and the need for internalizing the environmental and social requirements in the design and implementation of the project activities. The ESMP document will be made available on the website of the GNHC, BTFEC and Dzongkhags of Dagana, Paro, Sarpang and Tzirang. Also, the hard copies will be made available at the PCU at GNHCS and the concerned Dzongkhag and Gewog Administrations. During the implementation of the project, activity-specific mitigation plans including gender actions plans should be disclosed to all stakeholders, including affected communities and Civil Society Organizations (CSOs). Disclosure should occur in a manner that is meaningful and understandable to the affected people for their consent.

### **Disclosure framework for ESMP related documents**

Documents to be disclosed	Frequency	Where
ESMP document	Throughout the project period.	Websites of GNHC, Dzongkhags of Dagana, Paro, Sarpang, Tzirang and hard copy at GNHC, Dzongkhags and Administrations
Quarterly Progress Report by the Dzongkhags	Quarterly	PMU and Dzongkhags
Minutes of Formal Public	Within two weeks of meeting	Websites of GNHC, Dzongkhags of Dagana,

Consultation Meetings		Paro, Sarpang, Tzirang and hard copy at GNHC,
Semi-annual progress report by the SGE	Semi Annual	Websites of GNHC, Dzongkhgas of Dagana, Paro, Sarpang, Tzirang and hard copy at GNHC

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## **PROCEDURES FOR IDENTIFICATION AND VALIDATION OF UNIDENTIFIED SUB PROJECTS (USPs)**

In case significant risks are identified during the project implementation, activity-wide E&S assessment will be conducted. Activity and site-specific E&S management measures need to be incorporated into the project. Where technical advice and support is required, it can be sourced from the Gender and Safeguards expert through the PMU.

For each sub-project, ESIA will be carried out to predict and assess the potential environmental and social impacts and design appropriate mitigation, management and monitoring measures. The process will be in compliance with national standards, AF and OSS Policies and will include the following steps:

- Screening: For predicting, understanding and assessing potential sub-project/activity impacts. In other words, it aims to determine if a sub-project/activity is likely to have significant environmental and social effects. Basing on the 15 principles of the AF, the purpose of Screening is to determine whether or not an EIA is required;
- Scoping: If a full ESIA is required, scoping establishes the studies that will be required as part of the ESIA process including the identification of data availability and gaps. It determines the appropriate spatial and temporal scopes for the assessment and suggests suitable survey and research methodologies;
- Impact Prediction and Evaluation: is the heart of the ESIA and involves analyzing the impacts identified in the scoping to determine their nature, temporal and spatial scale, extent and effect.
- Mitigation: aims to eliminate or reduce negative sub-project/activity impacts through suggesting appropriate measures;
- Social and Environmental Management Plan (SEMP) and monitoring: It defines resources, roles and responsibilities required to manage sub-project/activity impacts and implement mitigation measures.

## **Annex 1: Terms of Reference for Safeguards and Gender Expert**

POST TITLE: Safeguards and Gender Expert  
PLACE OF POSTING: Project Management Unit

The job responsibilities will include but not limited to:

- Providing support in internalizing the environmental and social issues in the project's activity planning & design and to address the potential impacts as well as to promote good practices.
- Developing a set of planning and implementation tools and guidelines for training of the officials on environmental and social safeguard. These will be used for training and as reference materials for the field staff during implementation of project activities. The training could include providing basic knowledge and information on the key environmental and social issues associated with the project activities and in relation to the 19 ES principles of GEF and BTSEC.
- Supporting the Dzongkhags in preparing their quarterly ESS and gender action plan implementation reports.
- Prepare semi-annual report on ESS and gender action plan implementation to the PMU and annual report to the Project Steering Committee
- Any other related tasks that are proactive in nature to minimize risks arising out of environmental social issues arising from the implementation of project activities.

Qualifications and Experience:

- Master's degree in Environmental/Planning/Social Science
- The candidate should have at least 8 years of experience out of which two to three years of professional experience in preparation of Environmental Impact Assessments (EIA) and Environmental Management Plan (EMP) and well versed with national and local environmental regulations and compliance requirements including work experience in gender mainstreaming.
- Candidates having experience in projects assisted or funded by the GEF shall be given preference
- Ability to interact with and motivate/guide stakeholder to carry out due diligence for environmental, social and gender activities.
- Candidates are expected to possess good written and verbal communication and analytical skills, with ability to work with interdisciplinary team.

## Annex 1: List of participants at the stakeholder consultations

Consultation on Environment and social safeguards and Gender for project "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Dagana from 14-15th April, 2021

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature	
						Day 1	Day 2
1	Dorji	ACFO	BTSEC	dojibhutan@gmail.com	17909870		
2	Chenwas Dan	Kana Lhp	Kana	long3@gmail.com	17641374		
3	Kenelo Wangdi	Rape Th	Parast	kenwangsdi@gmail.com	9921404		
4	Phul Mayankatam		Kana	-	77322225		
5	Gogzal		"	-	17806254		
6	Uactor	-	Kana	-	17830586		
7	Takerng Yagzer	Adm Asst	Health	tyngzom2015ty@gmail.com	1794843		
8	Pasang Wangli	Phounder Thimi	Dagana	-	16906678		
9	Shine Tsering	-	Dagana	championstshing@gmail.com	17599068		
10	Nimes D Tamang	IT	"	delma2019@gmail.com	17871033		
11	B-B. Tny	fecul	Dagana	bblamang20107@yahoo.com	17688619		

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature	
						Day 1	Day 2
12	Ganesh Kumar Gang	LPO	DLS	gkganung@dagangut	77403880		
13	N.B. Bimra	Att. Guide full Dagana	Dagana	nolana080@gmail.com	174462625		
14	Ugyen Dorji	DRD	DES	udorji@dagangut	17396529		
15	Phesba	Group	Dago	phesba@dagangangut	17159161		
16	Gembo	Farmer	"	-	17657225		
17	Choki	"	"	-	17694005		
18	Songam Jantscho	AMCO/dttg	DDA	jantshosongam23@gmail.com	17567280		
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20	Thinklay Wangdi	BTSEC	"	-	17311572		
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**Consultation on Environment and social safeguards and Gender for project "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Dagapela on 16th April, 2021**

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Environmental, Social and Gender Assessment for Proposed Project to Adaptation Fund on "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" in Paro Dzongkhags  
Tsherim Resort, Paro, (20 April 2021)

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**Environmental, Social and Gender Assessment for proposed project to Adaptation Fund on "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Sarpang, 15th June 2021**

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Environmental, Social and Gender Assessment for proposed project to Adaptation Fund on "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Tsirang from 9-11th June, 2021

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## Annex 2:

### Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan

#### Gender Analysis and Action Plan

#### Bhutan Trust Fund for Environmental Conservation

## **Abbreviations and Acronyms**

AF	Adaptation Fund
BT FEC	Bhutan Trust Fund for Environmental Conservation
CEDAW:	Convention on Elimination of All Forms of Discrimination Against Women
DoFPS:	Department of Forest and Park Services
DPO:	Dzongkhag Planning Officers
FGD:	Focus Group Discussion
FYP:	Five Year Plan
GAP:	Gender Action Plan
GDP:	Gross Domestic Product
GGI:	Gender Gap Index
GII:	Gender Inequality Index
GNH:	Gross National Happiness
HDI:	Human Development Index
KPI:	Key Performance Indicators
MoAF:	Ministry of Agriculture and Forest
MoLHR:	Ministry of Labor & Human Resources
NCWC:	National Commission for Women and Children
NKRA:	National Key Result Areas
PHCB:	Population and Housing Census
SDG:	Sustainable Development Goals

## **List of Glossary**

Dzongkhag:	District
Gewog:	County, consisting of a block or villages
Chiwog:	A group of households
Tshogpas:	Chiwog Representatives

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## Project Information

9.	Project Title	Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan
10.	Project Grant Amount (US\$)	9,998,954
11.	Grantor Agency	Adaptation Fund
12.	Location (Global/Region/Country)	Bhutan (Dagana, Paro, Sarpang and Tsirang districts)
13.	Project Start Date	January 2022
14.	Project End Date	February 2027
15.	Implementing Entity (NIE)	Bhutan Trust Fund for Environmental Conservation (BT FEC)
16.	BT FEC Focal Strategic Areas	Mitigating and adapting to climate change

## Project Objective

The main objective of this assessment on Gender analysis and Gender Action plan is to contribute to the overall project objective: “to build resilience to climate change and adaptive capacity of water stressed communities in the dzongkhags of Dagana, Paro, Sarpang and Tsirang”. This will then support implementation of the “National Water Flagship Program”.

## Objective of Gender Analysis

The aim of gender analysis is to provide an overview on gender issues in Bhutan, highlight gender situation in the project areas specific to water resources and water management and to recommend gender specific activities to address issues related to the project. The analysis was based on secondary available data from various studies conducted by the Royal Government of Bhutan and development partners and information collected during the project preparation phase. This gender analysis was used as a basis to prepare the Gender Action Plan (GAP) which is annexed to this report. The GAP recommends grounded and practicable gender-sensitive interventions to be implemented during the implementation period of the project.

## Overall Gender Equality Situation in Bhutan

Bhutan is signatory to the Convention on Elimination of All Forms of Discrimination (CEDAW) and the Convention on the Rights of the Child (CRC).

Bhutan signed the CEDAW in 1980 and ratified in 1981 reflecting Bhutan’s its commitment towards realizing gender equality and empowerment. The National Commission for women and children (NCWC) was established in 2004 as the nodal agency for protecting the rights of women and children and spearheads its fulfillment to



CEDAW and other regional and international conventions. It coordinates with government agencies to ensure gender equality and mainstreaming in policies and programs. For example, every ministry and *Dzongkhag* has a gender focal person who is expected ensures gender equality and elimination of discrimination against women.

The Constitution of Bhutan, under Article 7, ensures fundamental rights, which are intrinsic in ensuring gender equality. Article 7(15) provides that “All persons are equal before the law and are entitled to equal and effective protection of the law and shall not be discriminated against on the grounds of race, sex, language, religion, politics or other status.” This provision underscores the right to equality of women. Article 7(6) provides “A Bhutanese citizen shall have the right to vote.” This provision is important not only because it is a political right of women to participate in the selection of their central and local governments but more so because it empowers Bhutanese women. This right empowers women to express their freedom, a freedom that entails choice. Article 7(11) provides Bhutanese women right to equal pay for work of equal value, especially when the principle of equal pay for work of equal value around the globe remains elusive.

The Labor and Employment Act, 2007, provides for favorable working conditions for pregnant and nursing mothers, and equal pay for work of equal value. The Act emphasizes that there should not be discrimination based on sex against employees or job applicants in connection with recruitment, dismissal, transfer, training and demotion.

The Local Government Act 2009, similarly, does not differentiate between sexes, as all registered Bhutanese are eligible for office, if they fulfill set criteria. However, one of the criteria includes a certain level of education, which is disadvantageous for women as they are on average less educated than men.

The Penal Code of Bhutan has dedicated an entire chapter, Chapter 14, to criminalize various degrees of sexual harassment, rape, and physical and verbal abuses.

Bhutan’s Inheritance Act of 1980 guarantees equal inheritance rights to men and women. Traditional inheritance practices in Bhutan favor of inheritance to daughters and as a result, proportion of rural women holding land registration titles are higher than men.

The 12<sup>th</sup> FYP, with its overall for a. “Just, Harmonious and Sustainable Society through enhanced Decentralization”, outlines gender responsive priorities such as: Eradicating Poverty and Reducing Inequality; Creating Productivity and gainful employment; Access to quality Health Services; Improving the quality of Education; Strengthening Democracy and Decentralization; Reducing Corruption; Improving Justice System and Promoting Gender Equality. Gender mainstreaming in national plans in Bhutan was initiated with the 10th FYP. It started with the adaptation of guidelines to mainstream gender into all planning aspects to elevation as one of the 16 National Key Result Areas for the 11th Five-year Plan. In the ongoing 12 FYP, recognized gender as a cross-cutting theme and advocates all ministries, agencies and concerned sectors to address gender gaps by integrating into their plans and programs based on gender analysis.

This Plan also has “Gender Equality and Women and Girls Empowered” as a National Key Result Area with key performance indicators and targets that will measure women’s representation in Parliament.

The Third National Communication of Bhutan (TNC) to UNFCCC, 2019 recognizes that there are also several areas in where women are at a disadvantage compared to men, such areas being, politics and decision-making, tertiary education and economy, with rural women being more vulnerable.

The literacy rate for women, which stands at 63.9 percent, is lower than that for men, which is 78.1 percent in urban areas (PHCB 2017). This translates into lower levels of female participation in formal employment and high public office. The document outlines that majority of the population are still directly dependent on agriculture and as more men tend to out-migrate from rural to urban areas seeking employment and work for wages, women are mostly required to work in the field to support the children and elderly in the rural areas. Hence women are most vulnerable to the impacts of climate change and have limited capacity and resources to adapt as many settlements in the country faces acute shortages of water for drinking and irrigation exacerbated by changing monsoon patterns and decreasing snow cover.

Bhutan’s Human Development Index (HDI) value increased from 0.572 to 0.607, between 2010 and 2015, which was an increase of 0.6%<sup>25</sup>. The HDI value of 0.607, placed the country under the medium human development category, positioning it at 132 out of 188 countries and territories<sup>26</sup>. However, with respect to Gender Inequality Index (GII), Bhutan’s stood at 0.477 ranking it 110<sup>th</sup> out of 159 countries in 2015. The GII reflects gender-based inequalities in three dimensions: reproductive health, empowerment and economic activity<sup>27</sup>. Women hold only 8.3 % of parliamentary seats, 5.8% of adult women have at least a secondary level of education compared to 13.4% of their male counterparts. For every 100,000 live births, 148 women die from pregnancy related causes and the adolescent birth rate is 21.4 births per 1000 women of ages 15-19. Female participation in the labor market is 58.7% compared to 78.3% for men<sup>28</sup>

The National Gender Equality Policy, 2019 recognizes that gender differences are visible in climate change vulnerability, participation in climate change decision-making and action, and diverse levels of benefit-sharing. As male out-migration increases, the responsibilities and roles of women become more difficult and working conditions deteriorate. The policy also recognizes that women in Bhutan perform 71 percent of unpaid household and care work. Because of all their roles and responsibilities, rural women are more vulnerable to the effects of climate change, and they are more affected than men when climate- induced disasters hit. The policy, therefore, envisages mainstreaming gender in all disaster and climate change related initiatives through

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<sup>25</sup> UNDP 2016, *Briefing Note Bhutan Human Development Report*

<sup>26</sup> *Ibid*

<sup>27</sup> *Ibid*

<sup>28</sup> *Ibid*

acknowledgment of the differential impacts of disasters and climate change on women and men, and the positive roles that women can play in adaptation and mitigation efforts and to improve gender friendly infrastructure and facilities in the rural areas.

## Gender policy and AF and BTFEC

The BTFEC's Gender Equality Strategy Framework defines the process for Gender Analysis in a project to include Gender roles and activities; access and control over resources; legal and political considerations and Social and cultural patterns. The legal and political considerations and Social and cultural patterns are captured through secondary data sources. The PPG process carried out a participatory gender assessment in the project areas to assess Gender roles and activities; access and control over resources.

## Gender Assessment in project area

Stakeholder consultations were held in the project area to assess gender situation in the context of project activities. These consultations were held in the following locations as follows (See Table 1);

Table 1: Location of stakeholder consultations and participating Gewogs

Dzongkhag	Gewogs	Location of consultations and Remarks
Dagana	12 Gewogs of Dorona, Drujeygang, Gesarling, Gozhi, Kana, Khebisa, Largyab, Nichula, Tashiding, Tseza, Tshangkha, Tshendagang, Karmaling and Lhamoizingkha	<i>Location;</i> Dagana Dzongkhag for Kana and Tsesa gewogs  Gozhi Gewog center for other 10 gewogs  Community representatives of Karmaling and Lhamoizingkha Gewogs could not participate due to COVID-19 norms.
Paro	Dhopshari, Dokar, Lamgong, Naja and Shaba	Location; Dopshari
Tsirang	Tsirangtoe, Phuentenchhu and Semjong	<i>Location;</i> Tsirang toe Gewog center for Tsirangtoe  Phuentenchhu Gewog center for Phuentenchhu and Semjong Gewogs  Tsirang Dzongkhag was not included in the project concept note. It has been added upon recommendations by the GNHC and upon acceptance by the

		Adaptation Fund in May, 2021. Out of the 12 gewogs the Dzongkhag prioritized inclusion of these three gewogs in the project. Component 2 of the project will focus on drinking water supplies in Tsirang
Sarpang	Serzhong, Chuzergang and Shompangkha	<p><i>Location;</i> Gelephu</p> <p>Sarpang Dzongkhag was not included in the project concept note. It has been added upon recommendations by the GNHC and upon acceptance by the Adaptation Fund in May, 2021. Out of the 12 gewogs the Dzongkhag prioritized inclusion of these three gewogs of Serzhong, Chuzergang, Shompangkha in the project.</p> <p>Component 2 of the project will focus on drinking water supplies in Sarpang</p>

The proportion of male and female population in the project areas is 51 percent and 49 percent respectively as compared to 51 percent and 48 percent at the national level (See Table 2). The proportion of female population in the project area is slightly lesser than the proportion at the national level. Overall, 8 percent of the Bhutanese population of 727,145 reside in the project area comprising of 4 Dzongkhags, 25 Gewogs.

*Table 2: Population in the project area*

<b>Dzongkhag</b>	<b>Gewog (including urban area)</b>	<b>Male pop</b>	<b>Female Pop</b>	<b>Total</b>
Dagana	Drukjeygang	1215	1302	2517
	Gozhi	1,256	1,251	2507
	Karna	1,271	1,239	2510
	Khebisa	597	618	1215
	Largyab	454	389	843
	Tseza	1406	1236	2642
	Tsangkha	863	844	1707
	Karmaling	785	539	1324
	Dorona	415	337	752
	Gesarling	933	730	1663
	Lhamoi Dzingkha	1423	1334	2757
	Nichula	242	192	434
	Tashiding	843	844	1687
	Tsenda-Gang	1253	1154	2407
Paro	Dhopshari	1,623	1,710	3333
	Dokar	1,116	1,211	2327

	Lamgong	2,972	2,874	5846
	Naja	1,894	1,858	3752
	Shaba	3,258	2,683	5941
Sarpang	Chhuzanggang	1,262	1,237	2499
	Serzhong	1,285	1,422	2707
	Shompangkha	757	729	1486
Tsirang	Pungtenchhu	665	666	1331
	Semjong	712	600	1312
	Tsirang Toed	769	682	1451
Project areas population		29269	27681	56950
<b>% of Male &amp; Female population (Project area)</b>		<b>51</b>	<b>49</b>	
Male & Female population (National)		380,453	346,692	727,145

Source; PHCB, 2017 (the Gewog population figures include both urban and rural population in the same gewog)

Agriculture sector employs the majority of Bhutanese population (58 percent). Over 30 percent of those engaged in agriculture are women (See Table 3).

*Table 3. Percentage share of employed persons by major activity and gender, 2018*

<b>Major Economic Activity</b>	<b>Male</b>	<b>Female</b>	<b>Total</b>
Agriculture and Forestry	27.5	30.5	58.0
Mining and quarrying	0.5	0.1	0.5
Manufacturing	2.8	3.7	6.5
Electricity, Gas and Water Supply	0.6	0.2	0.8
Construction	1.5	0.3	1.8
Whole Sale and Retail Trade	3.2	4.6	7.8
Hotels and Restaurants	1.1	1.2	2.3
Transport, Finance and Communications	3.3	0.3	3.7
Financial Intermediation	0.5	0.2	0.7
Real Estate, Renting and Business Activities	0.7	0.3	0.9
Public Administration and Defense Activities	7.4	1.8	9.2
Education	1.7	1.6	3.3
Health and Social Work	2.9	1.9	4.0
Private Households and Employed Persons	0.0	0.5	0.6
<b>Total</b>	<b>53.6</b>	<b>46.6</b>	<b>100.0</b>

Source: MoLHR, Labour Force Survey, 2018

Focus group discussions (FGD) were held with communities' representatives of the project Dzongkhags and Gewogs to understand gender roles and challenges in water and water resources management at different levels. These FGDs were held in the context of understanding that "Gender Equality implies a society in which women and men enjoy the same opportunities, outcomes, rights and obligations, in all spheres of life. Equality between men and women exists when both sexes are able to share equally

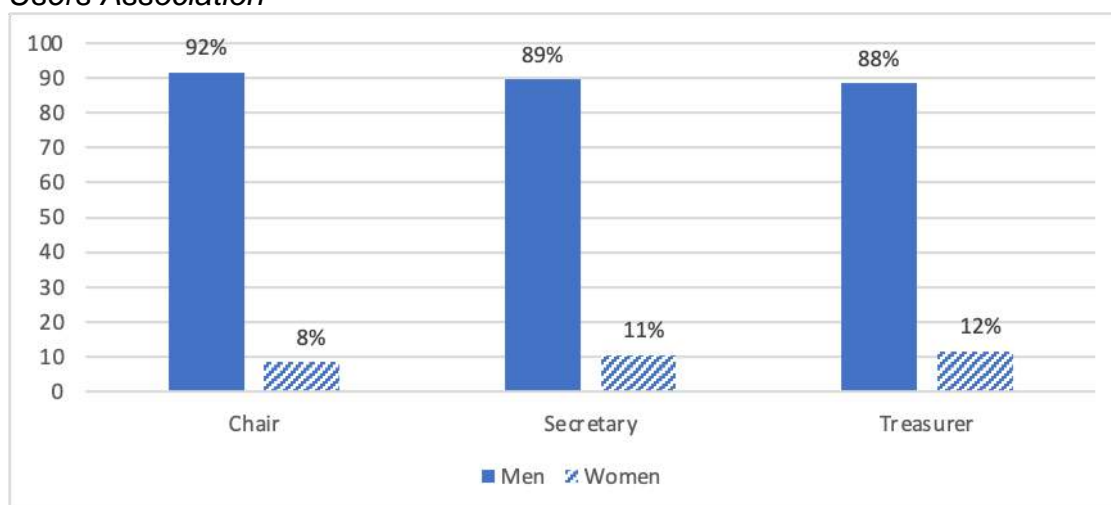
in the distribution of power and influence; have equal opportunities for financial independence through work or through setting up businesses; enjoy equal access to education and opportunity to develop personal ambitions. A critical aspect of promoting gender equality is the empowerment of women, with a focus of identifying and redressing power imbalances and giving women more autonomy to manage their own lives. Women's empowerment is vital to sustainable development and the realization of human rights for all"<sup>29</sup>

The participatory assessment of gender situation revealed the following;

#### **6.1: Participation in water governance**

All Gewogs in the project area have a practice of establishing a Water Users Association (WUA) for oversight management of drinking or irrigation water schemes amongst households using water from a facility. The office bearers of these WUAs comprise of Chairperson, Secretary and a Treasurer. Overall women representation comprises of only 11 percent of the office bearers for WUAs in the project area (See Figure 1)

*Figure 1: Proportion of women representation in the executive committee of Water Users Association*



*Source, Field Data collected during stakeholder consultations, June, 2021*

Most of these WUAs are recognized by the Gewog Administrations. However, they are not formally registered and members officer bearers of these WUAs needs training in water governance, management and water dispute resolutions. The project should support formal registration of all WUAs as per the Water Regulations of Bhutan, 2014 and ensure with the following information;

- Name and address of the WUA;
- Names of the Chairperson and office bearers (and gender)
- List of users with irrigable land holdings and household members of each user;
- Length and flow volume of the water facility;

<sup>29</sup>Ampumuza, C. et al., 2008, *Women Empowerment through tourism*, Wageningen University, The Netherlands

- The date of construction and the last maintenance done on the water facility;
- Name and location of the irrigation or drinking water source;
- Whether the Association is for drinking water, irrigation or both; and
- List of other commercial users, if any.

The project should aim to raise the representation in officer bearers of WUAs by women from 11% to 20% by end of the project period and

As per the Bhutan Water Regulations, the WUAs are expected carry out functions related to Protection and conservation of its water source; equitable and fair access to water supply; hear and decide on disputes between or amongst its members relating to water and infrastructure use; Maintain records its members, mechanism for distribution of water, of minutes of its meetings and decisions, books of accounts on the money received and disbursements; made by the Association; Adopt measures for the efficient use of water and determine and adopt water user fees that commensurate with the services; Appoint water guard and coordinate with other Gewogs of authorities.

RWSS Policy, 2014 recognizing that equal opportunities for participation and benefits to the poor, marginal and vulnerable groups are essential for reducing disparities in services and ensuring maximum benefits and impact of facilities, these groups will be identified during the planning of schemes and efforts made to ensure that these groups have access to and benefit from improved water supply and sanitation facilities.

During participatory assessment of gender roles and capacities, the stakeholders identified the need to enable higher level of participation by women in governance and management institutions. Hence, it is proposed that the project should support enabling;

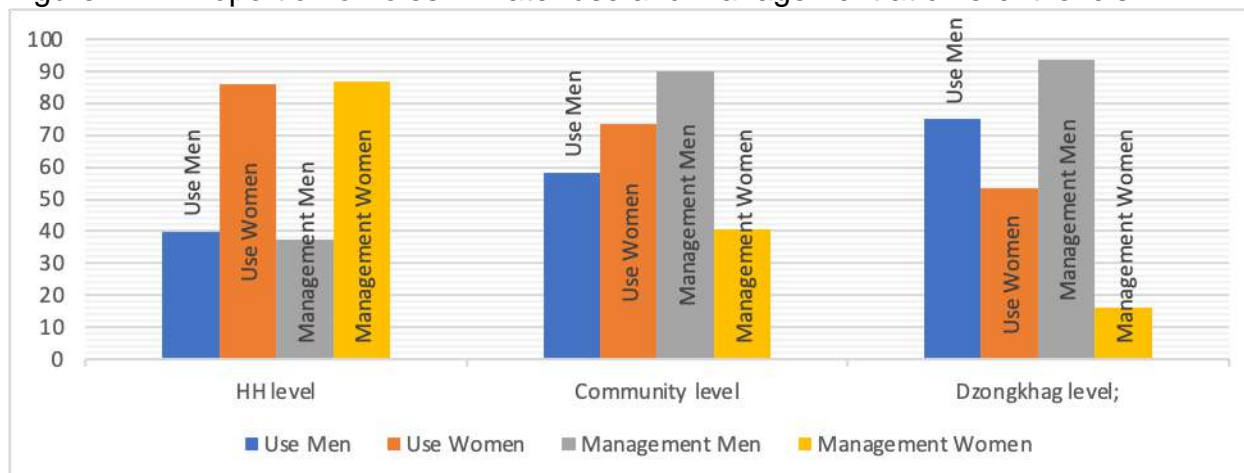
- Formal registration of all WUAs in the project areas with enhance participation by women. For this the project should provide capacity building of WUA office bearers in
  - Awareness on water act,
  - Water regulations,
  - Group formation and management,
  - Water source sharing,
  - Conflict and dispute resolution,
  - Labour regulations and Labour Safety,
  - Roles and responsibilities of stakeholders in water management,
  - Gender equity in water management,
  - Mechanism for distribution of water;
  - Innovations for sustainability in water management such as introduction of fees and PES mechanisms,
  - Management of WUAs,
  - Record keeping

## **6.2: Water use and management**

During the participatory assessment of gender roles in the project areas, participants viewed that usage and management of water largely handled by women at the

household level and by men at the Dzongkhag level (See Figure 2 & Table 4). However, at the community level, water usage is mostly handled by women while management is handled largely by men which indicates a disconnect between water users and water managers. This indicates the need for engaging more women in water management roles at the community level. It also indicates that there is a gap between the majority of end users of water, who are largely women, at household levels and decision makers in the management of water at the Community and Dzongkhag levels who are largely men.

Figure 2: Proportion of roles in water use and management at different levels



Source, Field Data collected during stakeholder consultations, June, 2021

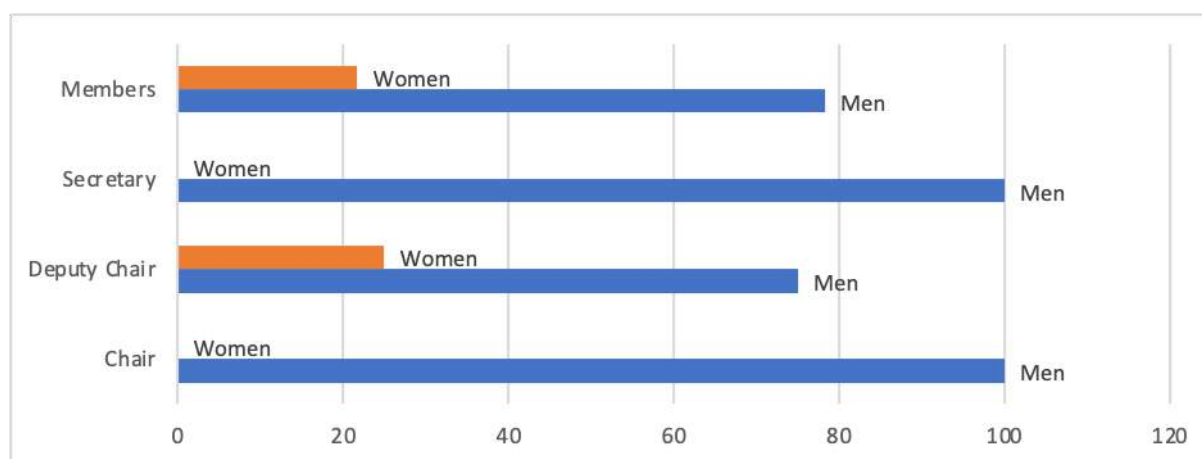
Table 4: Water usage and management at different levels

Levels	Use		Management	
	Men	Women	Men	Women
Household level	40	86	37	87
Community level	58	73	90	41
Dzongkhag level	75	53	93	16

Source, Field Data collected during stakeholder consultations, June, 2021

Within the project Dzongkhags the Dzongkhag level, 100 percent of Dzongkhag Tshogdu (DT) chairperson; 75 percent of Deputy Chairperson, 100 percent if DTY Secretary and 78 percent of members are men (See Figure 3).

Figure 3: Proportion of gender representation at the DT in the project area

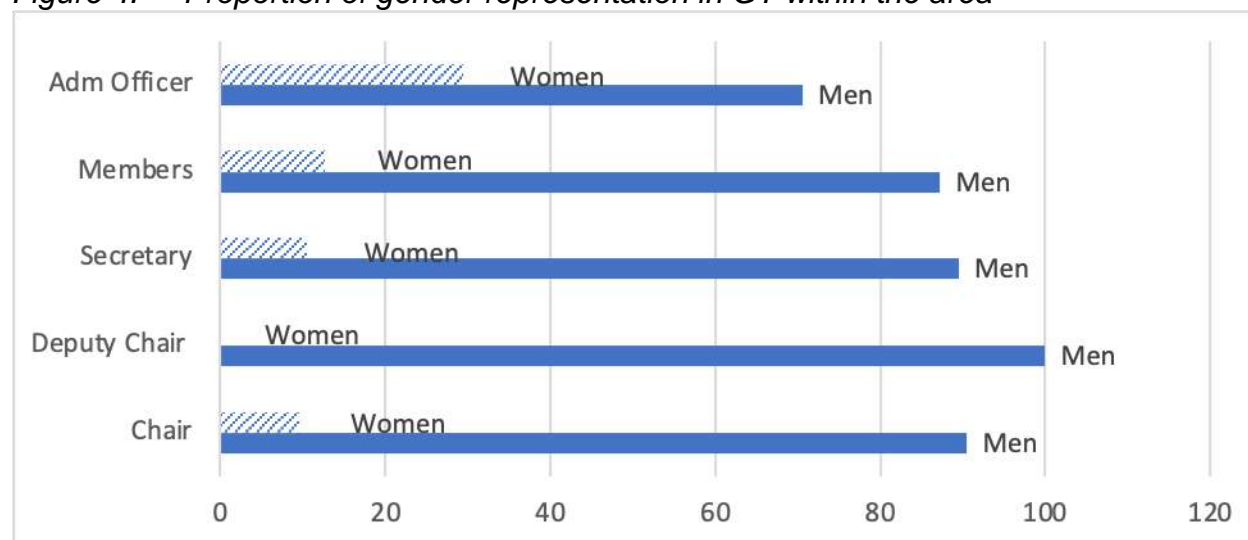




Source, Field Data collected during stakeholder consultations, June, 2021

The situation is still skewed towards men at the Gewog level within the Gewog Tshogde (GT). The representation of women in the GT is 29 percent as compared to 22 percent at the DT level.

Figure 4: Proportion of gender representation in GT within the area



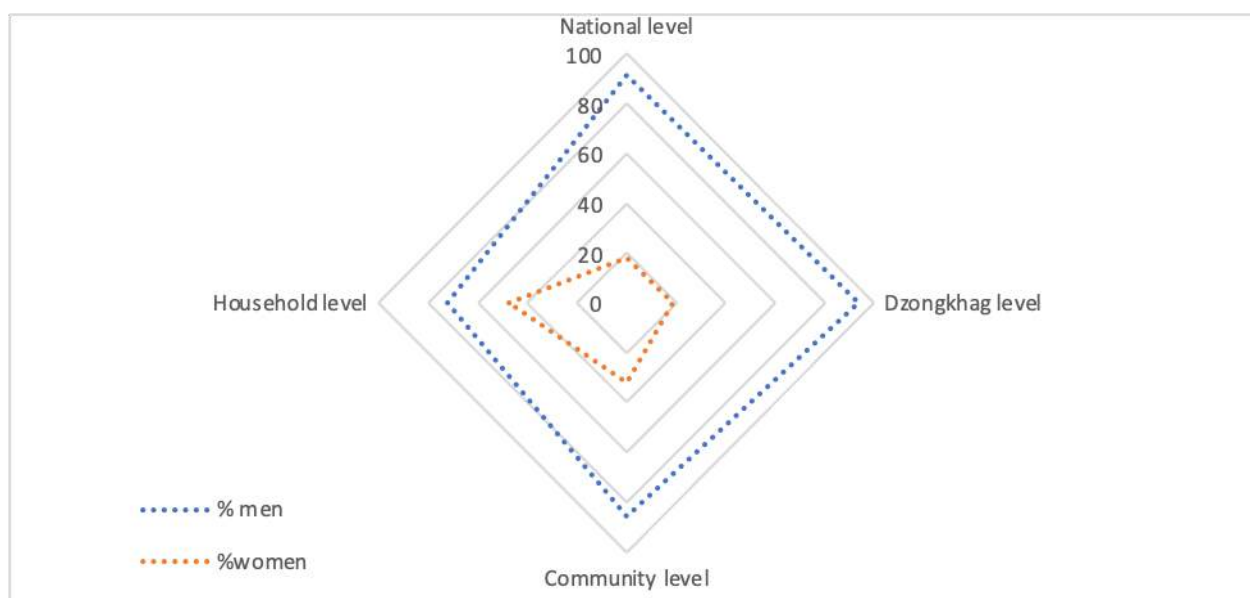
Source, Field Data collected during stakeholder consultations, June, 2021

The study showed that there is an urgent need to empower and build the leadership of female farmers, and to enhance their communication skills—so as to strengthen their voice and decision-making abilities in (local) governance and farming decisions, including those related to CSA/CRA.

### 6.3: Gender roles in water related activities

Men play a greater role in maintenance of water related infrastructure. However, women also take up significant roles in maintenance of infrastructure at community and household levels which indicates the need for enabling participation by women capacity building for water maintenance, use of tools and equipment and in promoting improved tools and technologies in water maintenance at local levels.

Figure 5: Role in maintenance of water infrastructure



Source, Field Data collected during stakeholder consultations, June, 2021

However, 90 percent of the participants view that men have enjoy better access to training opportunities a than women. Given the significant role that women play in maintenance of infrastructure at the community and local levels, the project support in terms of training opportunities in water infrastructure should include equal participation by women. Women have a greater role in use of water for cooking, cleaning, watering livestock and kitchen gardens as compared to the greater role of men in use of water for field irrigation (See Table 5). In situations where water facilities are not maintained at the local levels, women would land up facing the larger brunt of dealing with lack of water supply and hence would find more value in having skills and capacity for water maintenance. Training women on efficient and economic use of water would also enable efficient utilization limited water resources.

Table 5: Gender roles identified by participants in use of water at local level

Use of water/Gender	Gender roles	
	% men	%women
Use of water for cooking	13	95
Use of water for cleaning	15	97
Use of water for livestock	58	67
Use of water for gardening	23	86
Use of water for field irrigation	85	45
Participation in meetings related to water at Dzongkhag level	92	31

Source, Field Data collected during stakeholder consultations, June, 2021

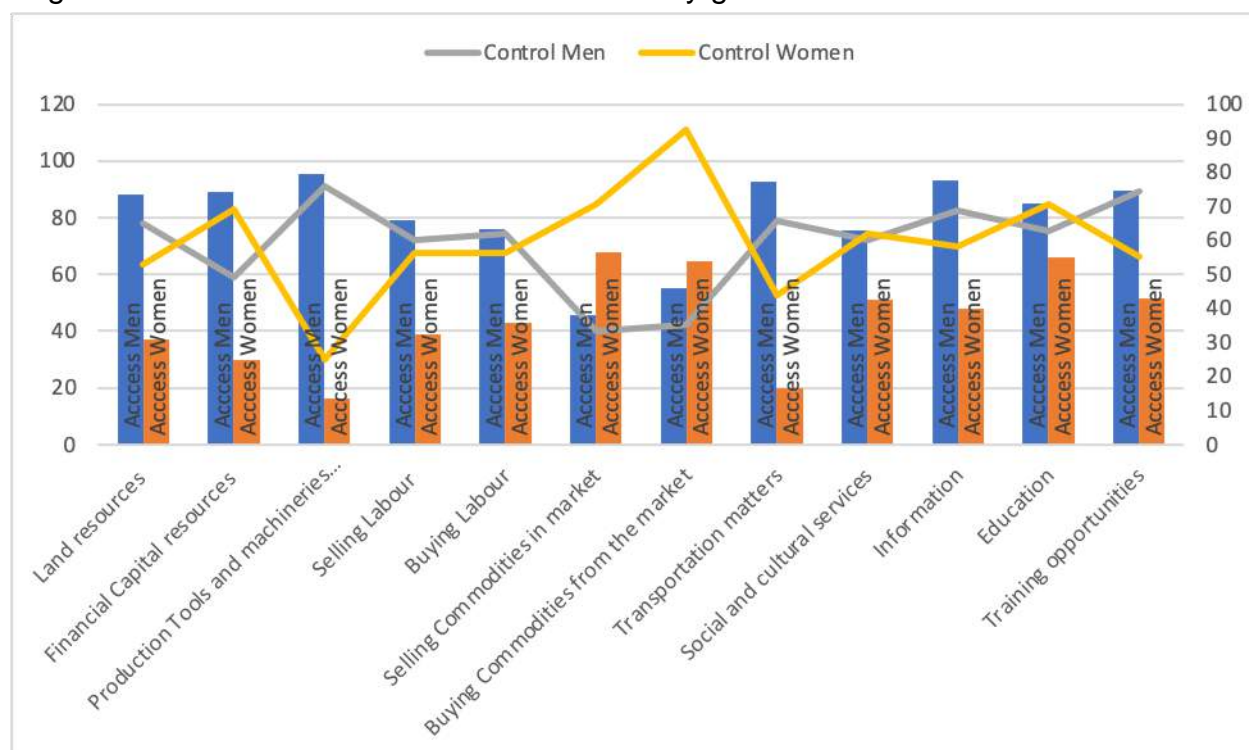
Women lack influence within existing water governance and management institutions, limiting their ability to change the redistribution of power and affect decisions. Training and capacity building would be required for women to engage in public decision making.

Therefore, the stakeholder consultations in gender proposed inclusion of training on practical and technical measures to enable both men and women at grassroots to enhance their skills in water management at local level. The type of skills and capacity required by the stakeholders, as identified during the stakeholder consultations included skills in;

- Water distribution and management
- Efficient/economic use of water
- New applicable technologies in water management,
- Use of maintenance tools and equipment,
- Plumbing and minor maintenance at HH and community level
- Climate resilient and efficient design of water infrastructure

#### 6.4 Access control over resources

Figure 6: Access and control over resource by gender



Source, Field Data collected during stakeholder consultations, June, 2021

Women largely have a higher level of control over decisions related to buying and selling of commodities. They stand very low in terms of control and access to production tools and equipment, transportation matters, information and training opportunities.

Access to information and training with respect to technology improvements defines who has access to water supplies. Where women have not been trained in the appropriate use of new technologies introduced to improve irrigation systems, they may not only fail to benefit from the improved availability of water. Moreover, if the water supply breaks down and cannot be re-instated quickly due to depend on men, they may have to shoulder the additional burden of carrying water for uses such as cleaning, cooking, sanitation.

In general proportion of rural women holding land registration titles are higher than men. However, in the project area, access and control over land resources are dominated by men indicating that men play a significantly larger role in decision related to buying and selling of land or in terms of cultivation and use of land resources. Men also play a larger role in irrigating agriculture land except in the case of kitchen garden which is a dominated by women.

Men do have better access to financial capital over women such in in actual spending. However, the control and therefore for decisions related to spending, investments, borrowings or lending are dominated by women (See Figure 6). Therefore, there is a need to enhance this capacity by including women in trainings related book keeping.

A survey on gender and climate change in Bhutan reported that 84 percent of men in Bhutan are aware of climate smart and climate resilient agriculture as compared to only 68 percent of women being aware of the same. It also reported that higher proportion of males enjoy access to information, training and inputs related to climate smart agriculture<sup>30</sup>. The PPG stakeholder consultations in the project areas also observe that men have better access and control over information, tools and training (See figure 6). The fewer opportunities for women relative to men to obtain skill and development training limit their participation in and the benefits they may gain from the use of new water technologies. Therefore, stakeholder consultations and meetings of the project should make concerted effort in creating awareness on impacts of climate change and technologies for improved water management.

## **Recommendations and Action Plan**

### **7.1 Recommendations**

- 1. Enhance participation by women in project activities, particularly in training and capacity development activities:** Support establishment of formal (registered) through capacity building and enabling formal registration of WUAs. Ensure that 30 percent of officer bearers in these WUAs comprise of women and that all trainings and workshops involving local communities achieve a 30 percent participation by women. The training needs are identified at two levels;
  - **Governance and management covering topics on** Awareness on water act; Water regulations; Group formation and management; Water source

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<sup>30</sup> Gender and Climate Change in Bhutan, CNWC, 2020

sharing,; conflict and dispute resolution; Labour regulations and Labour Safety; Roles and responsibilities of stakeholders in water management; Gender equity in water management; Mechanism for distribution of water; Innovations for sustainability in water management such as introduction of fees and PES mechanisms; Management of WUAs and Record keeping.

- **Climate resilient management and maintenance of water resources and infrastructure covering topics on** Water distribution and management; Efficient/economic use of water; New applicable technologies in water management; Use of maintenance tools and equipment; Plumbing and minor maintenance at HH and community level; Climate resilient and efficient design of water infrastructure
2. Formal registration of all WUAs in the project areas with enhance participation by women.
  3. Facilitate women and men's equal participation in and access to benefits project activities. Support the empowerment and leadership-building of rural women, and their full and meaningful involvement in the water resources and water management. Enable rural women to participate actively in WUAs.
  4. Enhance education, and conduct awareness-raising and advocacy on adaptation to climate change through climate resilient water management through training sessions and social media.
  5. **Grievance redress mechanism in place:** This mechanism must be put in place at the start of the project and approved by the Project Steering Committee to ensure a formal process for addressing concerns or complaints raised by individuals (particularly women) or groups affected by the project implementation activities. Both concerns and complaints can result from either real or perceived impacts of operations and may be filed in the same manner and handled with the same procedure. Measures should be in place to avert and mitigate conflicts arising out of project implementation including unequal distribution of water.
  6. **Appointment of a Gender Mainstreaming Specialist:** The project should hire a Gender Mainstreaming specialist who will have the knowledge of the local context and can work closely with the participating communities to ensure that gender equality and safeguards are fully built into project activities. The expert will identify gaps and support in capacity building and provide training to project staff and key stakeholders.

## Gender Action Plan

No	Gender gaps	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)
1	WUAs exist informally, with limited capacity and with very poor representation by women who are majority of end users of water	Establish formal registration of 50 WUAs (at least 2 WUAs in each of the 25 gewogs@ Nu. 30,000 as establishment and registration cost) with governance	Dzongkhag engineering section	year 1	100% of households and local institutions are enlisted as members of WUA  30% of office bearers are women  WUA data on available at the Gewog office	1,500,000
2	Women have limited access to technical maintenance and management of water infrastructure and remain to face the brunt of water shortages when minor maintenance is needed	Training on water infrastructure, use of tools and technologies and efficient use of water (150 participants, with 50% women*3 day@ Nu. 1,000 per day per trainee)	Dzongkhag engineering section	Year 2	50 % of participants are women	450,000
3	Limited awareness on water governance women empowerment in water governance	Training 300 community members on water governance and management at local level (6 participants from each of the 50 WUAs	Dzongkhag engineer, DAO, Dzongkhag Environment Officer, section	year 2	90 women trained in water governance and management	900,000

No	Gender gaps	Mitigation Measure	Responsibility	When	Key Indicator	Budget (Nu)
		comprising of 30% women * Nu. 1000 per day per trainee * 3 days)				
	Total cost of GA in Nu. (excluding cost of gender expert)					2,850,000
	<b>Total cost of GAP in US \$ (excluding cost of gender expert)</b>					<b>38,514</b>

## **GAP Compliance Monitoring**

The overall responsibility for implementing the GAP and for monitoring the compliance of the project's GAP activities lies with the PMU through coordinating with the Dzongkhag Engineering Section and the Gender Focal Person at each Dzongkhag. The Safeguards and Gender Expert (SGE) at the PMU shall oversee implementation of field activities relating to GAP and coordinate with the project Dzongkhags. He/she will be responsible for overall monitoring of compliance and in reporting on overall GAP implementation to the Project Manager. The GAP compliance monitoring will also include grievances that are reported through the Grievance Redress Mechanism (GRM) and on the status of redressal of grievances reported. The grievance data should be analysed and evaluated to make policy and/or process changes to minimize similar grievances in the future. Record of each grievance that has been reported and its resolution must be recorded and reported in the progress reporting of project activities.

The Terms of reference and costing for the SGE has been built in the Environmental and Social Safeguards document.



## Annex 1: Field data collection format for gender roles

Your Gender \_\_\_\_\_ Male/Female (tick); Your Gewog; -----

<b>Activity profile by gender</b>	<b>Question</b>	<b>Level</b>	<b>Men</b>	<b>Women</b>
Who manages water at		National		
		Dzongkhag		
		Community		
		Household		
Who collects water at		National		
		Dzongkhag		
		Community		
		Household		
Who uses water at		National		
		Dzongkhag		
		Community		
		Household		
Who is responsible for maintaining water infrastructure		National		
		Dzongkhag		
		Community		
		Household		
Who pays for water when there is a cost involved?				
Who mostly uses water for		Cooking		
		Cleaning		
		Livestock		
		Gardening		
		Field Irrigation		
Participation in meetings related to water		National level		
		Dzongkhag level		
		Community level		

### Access and Control Profile by gender

<b>Resources/Services</b>	<b>Access</b>		<b>Control</b>	
	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Women</b>
Land resources				
Financial Capital resources				
Production Tools and machineries resources				
Selling Labor				
Buying Labor				
Selling Commodities in market				
Buying Commodities from the market				
Transportation matters				
Social and cultural services				

Information				
Education				
Training				

What capacity building needs in relation to water resource management

	<b>Level</b>	<b>Capacity needs</b>
Men	Dzongkhag/Geowg	
	Community	
	Household	
Women	Dzongkhag/Gewog	
	Community	
	Household	

## Annex 2: Water gender governance data collection format

Water Governance Data of \_\_\_\_ Dzongkhag  
DT Profile by Gender

Position	Name	Gender (M/F)	Contact no
Thrizin			
Dy. Thrizin			
Secretary			
		Male (Number)	Female (Number)
Other Members			
Member			

GT Profile by gender  
Name of Gewog; -----

Position	Name	Gender (M/F)	Contact No
Thrizin			
Dy. Thrizin			
Secretary			
Admin Officer			
<b>Member data</b>		<b>Male (Number)</b>	<b>Female (Number)</b>
Tshokpa			

Water User Association's Profile by gender  
Gewog Name;-----

Name of WUA	Chair (M/F)	Secretary (M/F)	Treasurer (M/F)	No of male members	No of female members

### Annex 3: List of participants at the stakeholder consultations

Consultation on Environment and social safeguards and Gender for project "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Dagana from 14-15th April, 2021

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature	
						Day 1	Day 2
1	Dorji	ACFO	BTSEC	dojibhutanbtpd	17909570		
2	Uluwas Doo	Kana Luv	Kana	uluwas2@gmail.com	1761374		
3	Kencho Wang	Range Officer	Forest	kenwangchi@gmail.com	9761401		
4	Phul Mayakatan		Kana	-	77322225		
5	Gogzal		"	-	17806254		
6	Urador	-	Kana	-	17630586		
7	Tshering Yagor	Adm Asst	Health	tyngor2015ty@gmail.com	1794843		
8	Pasang Wang	Farmer	Dagana	-	16900678		
9	Shina Tshering	-	Dagana	championstshing@gmail.com	17599068		
10	Nima D Tamang	HT	"	ndima2019@gmail.com	17871028		
11	B-B. Tamang	Farmer	Dagana	bbsitamang20107@yahoo.com	17688219		

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature	
						Day 1	Day 2
12	Ganesh Kumar Gurung	LPO	DLS	gkgurung@chyangbuk	77403880		
13	N. B. Bismar	Off. Guide	Dagana	nbismar08@gmail.com	174362645		
14	Ugyen Dorji	DRD	DES	udorji@degangurung	17396529		
15	Phurba	Group	Dagana	phurba@degangurung	17109161		
16	Gembo	Farmer	"	-	17657275		
17	Choki	"	"	-	17694005		
18	Songam Jamshe	AMCO/Off. Asst	DDA	jamsheosongam23@gmail.com	17567280		
19	Nidup Peljor	Consultant	BTSEC	ceo@bpbhutan.com	17111656		
20	Tshering Wang	BTSEC	"	-	17311977		
21	Tamang	DEC	Dagana	jdang@degangurung	17601361		
22	Dorji Gyeltshan	Driver	BPV	sandee89@gmail.com	17494856		

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature	
						Day 1	Day 2
23	Pasang	Driver	BTFC		17777821		
24	Pema Wangmo	AA	BTFC		17966199		
25	Pachen Dorja	ARO	BTFC		17419048		
26	Duba	bashe Dzungela	Dagana				

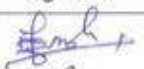



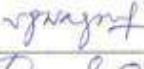
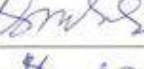
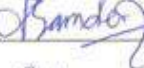




**Consultation on Environment and social safeguards and Gender for project "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Dagapela on 16th April, 2021**

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature
1	Namgay Felder	Corp.	Tashidip	nfelder@dagana.bt	17150511	
2	Dharmendra Gung	Group leader	Lajab Gung	dhgung@dagana.gov.bt	17762005	
3	Tamla	GUP	Tsangtha	tamla@dagana.gov.bt	17833076	
4	Nidip Dorji	Tshogpa	"	ndorji@gmail.com	17966493	
5	San Moya Pittokachy	"	"	spittokachy@gmail.com	17865820	
6	Khanber Singh (Farmer)		Lajab Gung	-	77717377	
7	Tobden Dorji	Tshogpa	Tashidip	-	17792959	
8	Amrit Dorji	public	Tashidip	-	17373624	
9	Phul Moya Gung	Public	Lajab Gung		17748882	
10	Sonan Thirley	Engineer	Dz. Admin. Dagana	sthirley@dagana.gov.bt	1776119	
11	Namgyi Wangchuk	Engineer	Dz. Admin.	nwangchuk@dagana.gov.bt	1779737	









Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature
12	Tantri	Grup	Gesri Ceng	tantri@gesri.com	17792228	
13	Direj	ACFO	BTFEC	direj@btfec.com	17509620	
14	Nidup Peljur	Consultant	BTFEC	ceo@bpubhutan.com	17161656	
15	Karna Tshul	Grup	D/SaaS	karna@dagana.gov.bt	17758335	
16	Nangay	"	Khabisa	nangay@dagana.gov.bt	17686001	
17	Jantshu	Tshulpa	D/SaaS	jantshu@dagana.gov.bt	17419609	
18	Nangay	"	D/SaaS	nangay@dagana.gov.bt	77736840	
19	Bal Bk Ras	T/Sagap	T/Sagap	balbk@dagana.gov.bt	17881577	
20	Sank Raj Rai	Grup	Dorona	sankrai@dagana.gov.bt	17773605	
21	Yeshi	Farmer	Khabisa	-	17792544	
22	Choden	"	"	-	17346728	

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature
23	Mani Kumar	Farmer	Dorona	-	77262295	
24	Mhim Kumar	Farmer (car)	Rogak	-	17375067	
25	Gangri Maya Rai	Unemployed	Dorona	mayarigangri@gmail.com	97402429	
26	Sangam Jantshu	Atto/Atto	DDA	jantshusangam@gmail.com	17569280	
27	B. B. Pamy	Focus person	Dagana	bstanam201070@gmail.com	17485619	
28	N. B. Bisma	Atto/Atto	Dagana	nblama03@gmail.com	17436268	
29	Bonds Boriguay	Farmer	Tshulpa	-	17573328	
30	Bonds Mangay	Farmer	Tshulpa	-	77338218	
31	Pam Wangmo	Grup	Gesri	pamwangmo@dagana.gov.bt	17500972	
32	Tshencho Zangpo	Farmer	Gesri	-	77431727	
33	Tshering Diji	"	"	-	77837253	

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature
34	Kingma Tabbay	Driver	Gozhi		17603358	
35	Rinchen Wangdi	GAD	"	rwangdi@degang.gov.bt	17341687	
36	Tamgyel	DO	Dzongkhag	jdgyel@degang.gov.bt	17601361	
37	Shinley Wangdi	IT	BTFC		17311577	
38	Pema Wangmo	AA	BTFC		17966199	
39	Pasang		BTFC			
40	Dorji Gyeltshen	Driver BPV	BPV	Samdang89@gmail.com	17491956	
41	Pema Dorjee	NFEI	Gozhi		77470515	
42	Rinchen Dawa	AFO	BTFC	-	17419048	
43	Jarmi Dorji	conductor	Gozhi	-	173836130	
44	Sonam Rinchen	Driver	Dzongkhag	-	17501872	

Sl.No	Name of Participant	Designation	Agency	Email ID	Contact Number	Signature
45	Tanden Wangdi	Driver	Gyatsoling		17808886	
46	Purna Bdr. Skyele	Driver	Ukheisa		17831268	
47	<del>...</del>	<del>...</del>	<del>...</del>			




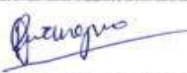
Environmental, Social and Gender Assessment for Proposed Project to Adaptation Fund on "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" in Paro Dzongkhags  
Tsherim Resort, Paro, (20 April 2021)

Sl.	Name	Agency	Email	Contact No	Signature
1	Penba Zangmo	Dor-shan Gewog Administration		17686494	
2	Phus Gyeltchen	11		17641170	
3	Gem Tiling	lungang Gewog	gemtiding19@gmail.com	1766654	
4	Khangzong Nima	1884	khangzongnima7@gmail.com	1773461	
5	Nido	Shoba Gewog		17999832	
6	Chencho Zangmo	Shoba Gewog		17685728	




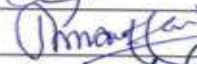




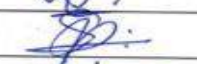
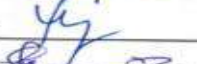




7	Tshering Changpa	Druckasia	Tshering Changpa 1991@gmail.com	17410087	Tshering
8	Yesin Dorj	Agriculture Dop-Shein	Yesindorj505 gmail.com	17413924	Yesin Dorj
9	Chundu Tshering	Mangoni	chunduknaja @gmail.com	17777363	Chundu Tshering
10	Pelden	Nlaja Gewog	-	77208591	Pelden
11	Lhak Dorj	Nlaja Gewog	-	17859645	Lhak Dorj
12	Uab Tshij	Dogar Gup	uabtkhij37 @gmail.com	17608309	Uab Tshij
13	chencho Gyelha	Shakpa "	gyelha E 012@gmail.com	17607281	chencho Gyelha

	Name	Agency	Email ID	Contact No.	Signature
14	Rinzi	Dogar Gewog		17521055	Rinzi
15	Kuanga	Dogar Gewog		17607244	Kuanga
16	Pema Dargyuk	CDCL		17889332	Pema
17	Passang Tshering	langang	-	17608449	Passang Tshering
18	Senam Tobgyal	Planning AMCO		77248555	Senam Tobgyal
19	Ngawang Dorji	E.O.		17698864	Ngawang Dorji
20	Passang Tshering	Farmer	-		Passang Tshering
21	Nidup Peltor	BTFC/Consultant	leo@bpvibhutan.com	17161651	Nidup Peltor

22	Thinley Wangeli	BTFEC	thinley@bhumantustfund.bt	
23	Yeshey Peldon	"	yeshey@bhumantustfund.bt	
24	Singye Dorji	"	singye@bhumantustfund.bt	
25	Phuntsho Chaden	"	phuntsha@bhumantustfund.bt	
26	Rinchen Wangmo	"	rinchen@bhumantustfund.bt	
27	Nani K. Shingelhar	"	nani@bhumantustfund.bt	
28	Dachha Dzungrel Kinley Nyeltha	Para Dzungelha		

			gundgondong	Driver Dzungrel	28
			gundgondong	Driver Dzungrel	29

**Environmental, Social and Gender Assessment for proposed project to Adaptation Fund on "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Sarpang, 15th June 2021**

Sl. No	Name	Designation	Name of Agency	Contact No.	Email Address	Signature
1	Phub Phendrup	CFU	DFO, DTFB	17936526	petherdub@maf.gov.bt	
2	Lachumant Rai	Gup, Singhi	L G	17341040	—	
3	Tshering Delkar	GAO, Sersha	Gershag	17813499	tsheringdelkar2002@gmail.com	
4	Yonten Dorji	GAO, Chhuzangpa		17689197	y.dorji@sarpa.gov.bt	
5	Sangay Tsering Gup	"	Chhuzangpa	27767697	"	
6	Yeshi Wangmo	Female Women Representative c/gau				
7	Tshering Temzin	male Representative "		17941651		
8	Lungy Dorji	SCAO	Singye	17276884		
9	Shavab Choden	P&P	"	"		
10	Lshain	W/P	S/Singye	1787727	lshainphing1665	
11	Bhaj Raj Rai		Singye	17400474		
12	Suk Dorji	Chief Sarpang P&P	S/Singye	17256483	Sukdorgijoyzang@gmail.com	

Sl. No	Name	Designation	Name of Agency	Contact No.	Email Address	Signature
27	Tika Lam	UAD	S/Kha	17928353	tygerung@gmail.com	
28	Kian Rai	Thogpa	-11-	17879268	-	
29	Kialang		11	17805585	-	
30	Pema Tshewang	Farmer	Sershang	17727745	-	
31	Pekten Lhamo	"	"	17511635	-	
32	Pema Choed	GFP	Dz. Admin	17445873	pchoeda@sarpang.gov.bt	
33	Tshering Dorji	APD	Sarpag	17546464	3antien80@gmail.com	
34	Midup Peljor	Consultant	BTFC	-	-	
35	Sangye Dorji	OIC	"	-	-	
36	Dorji	ACPO	"	-	-	
37	Rinchen Wangmo	APD	"	-	-	
38	Rinchen Dorji	AFO	"	-	-	
39	Passang	Messenger	"	-	-	
40	Chander	Driver (Serge)				

Sl. No	Name	Designation	Name of Agency	Contact No.	Email Address	Signature
41	Harka Bha	General Driver	Chompa	17953511	-	
42	Rinchen Dorji	Driver	Chompa	77715961	-	



Environmental, Social and Gender Assessment for proposed project to Adaptation Fund on "Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan" at Tsirang from 9-11th June, 2021

Sl. no	Name	Designation	Agency/Gewog	Email Address	Contact Number	Signature		
						Day 1	Day 2	Day 3
1	Penpa Singye Dorji	CIC	TS/FEC	gungyidshuntresthunde@tsirang.gov.bt	1799777			
2	Nas Bahadur Rai	CSE	Tsirangtoe	nbarai@tsirang.gov.bt	1782254			
3	Dimple Thapa	CFO	Tsirang Division	dthapa@moef.gov.bt	16901530			
4	Kama Wangmo	Planning Off	1 Dronyky	kamawangmo@tsirang.gov.bt	17508175			
5	Tandin Tshering	Tshogkpa	Tsirangtoe		1782254			
6	Tek Bahadur Rai	Tshogkpa	Tsirangtoe		17404289			
7	Tenzin Wangpo	Tshogpa	Tsirangtoe		17261351			
8	Nidup Tenzin	Tshogpa	Soanlung		17965808			
9	Tshering Tenzin	Asst. II	Agriculture	tsheringt2@gmail.com	17605570			
10	Chelen Dorji	RO	Tsirangtoe	ceelen4@gmail.com	17833877			
11	Harman Rai	Manager	Tsirangtoe	gunkhanghe87@gmail.com	1721599			
12	Nime Dorji	Graydoning	Tsirangtoe	nimedorji23@gmail.com	17782618			
13	Dhendup Tshering	Asst. Planning Officer	GNHC	dshering@gnhc.gov.bt	17903185			
14	Nidup Dorji	Consultant	TS/FEC	ceo@bprbhdn.com	1716156			
Sl. no	Name	Designation	Agency/Gewog	Email Address	Contact Number	Signature		
						Day 1	Day 2	Day 3
15	Sonam Wangmo	Farmer	Tsirangtoe		17876203			
16	Tila Maya Subba	CSE	Tsirangtoe	tilacsubba@gmail.com	17570576			
17	Thunsho Norbu	Farmer	Tsirangtoe		17469780			
18	Kintu	CDE	DES/Tsirang	kintu@tsirang.gov.bt	77195251			
19	Dorji Wangdi	Asst. II	Tsirangtoe	dorjiwangdi@tsirang.gov.bt	17807474			
20	Tshering Lham	shopkeeper	Tsirangtoe		17242865			
21	Wangchuk	Gewog Caretaker	Tsirangtoe		17426872			
22	Dorji Wangdi	DHO	Tsirang	Wangchuk@tsirang.gov.bt	17668774			
23	Nirmaya Kalden	Matron	Tsirangtoe CS	nirmayakalden123@gmail.com	17889802			
24	Yeshi	Principal	1	yeshi123@gmail.com	17686183			
25	Dorji Cheten	SA/HA	T/FEC FHC	dorjicheten123@gmail.com	17896262			
26	Singye	Driver	Tsirang		17908502			
27	Ugyen Wangmo	PA	"		17814296			

Sl. no	Name	Designation	Agency/Gewog	Email Address	Contact Number	Signature		
						Day 1	Day 2	Day 3
30	Pema	Dzongda	Tsirang	pema@tsirang.gov.bt	17989818			
31	Naungay Dorji	Dzongrab	Tsirang	ndorji@tsirang.gov.bt	17699248			
32	DORJI	ACFO	BTfEC		7760616			
33	Rinchen Wangmo	APD	BTfEC	rinchen@bhidantusthul.bt				
34	Rinchen Dama	AFO	"					
35	Pasang	Driver	"	pasang@bhidantusthul.bt				
36	Dhendrup Tshering	AFO	GNHC	dtshering@gnhc.gov.bt	1740005			
37	Daza	NFEI	Phuentenchu	ddaza@gmail.com	77486920			
38	Chamo Choden	CSE (NCS, DDC)	Phuentenchu	chamo@khamtib17	17802709			
39	Monkumari Pradhan	Farmer	Phuentenchu		17674360			
40	Budha mothi Subba	Farmer	Dragatho		17236522			
41	Rinchen Ngazem	farmer	Norkuthang		17990200			
42	Hemlal Adhikari	Tshospa	Tashichang		17467339			
43	Sir Dhyai	Tshospa	Tongshingap		17429451			
44	Krishna Lal	Tshospa	Peljenling		17667313			



no	Name	Designation	Agency/Gewog	Email Address	Contact Number	Signature		
						Day 1	Day 2	Day 3
45	Bao Bab Mafelisa	Tshoppa	Sengay		17579695			
46	Tule Ram Khoske	"	"		17385220			
47	Naine Singh Maye	Driver	"		17325961			
48	Tika Maya	Famer	"		17578338			
49	Budhi Maya	"	"		17427912			
50	Weyuo	"	"		17382350			
51	Ankur Bdo Pradha	Tshoppa	"		17650998			
52	Kirky Weydi	Offg: GAO	"	Kirky Weydi 1580@gmail.com	17777306			
53	Pam Bar Ri	Tshoppa	P/Chu		1749445			
54	Gom prd. Subba	Tshoppa	" "		17382708			
55	Jamphel	mayor	" "		1224129			
56	Nidup Wangdi	Principal	-11-		17995637			
57	Sangay Wangdi	St.ES II	-11-	swangdi72@gmail.com	1767525			
58	Cheta Gyeltshen	GAO	Phukha		17289722			
59	Rinchan Phuntsho	Driver	Dzongkhag		17615201			

Sl. no	Name	Designation	Agency/Gewog	Email Address	Contact Number	Signature		
						Day 1	Day 2	Day 3
60	Haman Subba	Gaydruing	Phuntenchu Gewog	haman.subba48@gmail.com	77494166			
61	Tara Devi Chhetri	Sales executive	FCB, Phuntenchu	taradevichhetri@gmail.com	17411175			
62	Dawa Tshering Sherpa	Driver	Phuntenchu, Gewog	sherpadaewatsherny76@gmail.com	77299554			
63	Pansu Ram Darjee	Care-taker	Phuntenchu, Gewog		17976254			
64	Top Nark Acharya	Grp. Secy	Sengay	tnacharya@teng.org.bt	17618213			
65	Pem Bdr Ghallay	AG	Dzongkhag		17692372			
66	Indra Bdr Kararia	Tech I	Dzongkhag		17539017			
67	Shiva Lal Kararia	Crup	Phuntenchu		177328393			
68	Thinley Phuntsho	Driver	Tsirangtse		17509135			
69	NIM Dorji	COK	Tsirangtse		17442537			
70	Tenzin Dorji	SF. PR-II	Biray Division					

**Annex-3-Budgeted M&E with provisions for mid-term and terminal evaluation and for the management of the environmental and social risks identified.**

**Suggested M& E plan**

<b>Sl. no</b>	<b>Activity</b>	<b>Responsibility</b>	<b>Budget</b>
1	Inception Workshop	BT FEC	15,000
2	Project Board Meetings	BT FEC, PMU	9,600
3	Adaptation fund secretariat learning missions/site visits	BT FEC, Adaptation Fund Secretariat	NA
4	Mid-term review tracking tools to be updated before Mid-Term Review	BT FEC, MoAF, MoWHS,	10,000
5	Mid-term review	BT FEC	50,000
6	Terminal Evaluation of the project	BT FEC	35,000
7	Addressing social and environmental grievances	Implementing entities and BT FEC	to be charged to project budget
8	Technical Advisory Group meetings	Implementing entities, BT FEC	9,600
9	Supervision and monitoring of activities	PMU, BT FEC	30000