ADAPTATION FUND

AFB/PPRC.23/23
24 September, 2018

Adaptation Fund Board
Project and Programme Review Committee
Twenty-Third Meeting
Bonn, Germany, 9-10 October, 2018

Agenda Item 6 q)

PROPOSAL FOR PAKISTAN

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 project concept document titled “Enhance community and local and national-level government capacities to address climate change interrelated urban flood and drought risks and impacts” was submitted for Pakistan by the United Nations Human Settlements Programme (UN-Habitat), which is a Multilateral Implementing Entity of the Adaptation Fund.

10. This is the first submission of the proposal using the two-step submission process. It was received by the secretariat in time to be considered in the thirty-second Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number PAK/MIE/Urban/2018/1, and completed a review sheet.

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

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

Project Summary

Pakistan – Enhance community and local and national-level government capacities to address climate change interrelated urban flood and drought risks and impacts

Implementing Entity: United Nations Human Settlements Programme (UN-Habitat)
Project/Programme Execution Cost: USD 533,576
Total Project/Programme Cost: USD 5,616,590
Implementing Fee: USD 477,410
Financing Requested: USD 6,094,000

[Project/Programme] Background and Context

The main objective of the proposed project is to enhance community and local and national-level government capacities to address climate change-interrelated urban flood and drought / water scarcity issues. Even though flood impacts and drought / water scarcity issues are often particularly severe in high density (i.e. urban) areas in Pakistan, a national approach / strategy to address this specifically in urban areas does not exist. Additionally, there is a lack of approaches that deal with flood impacts and related drought / water scarcity issues in a comprehensive manner. To tackle flooding and rising temperature that exacerbate these conditions in the target regions, the project aims to achieve its goal through the following components:

Component 1: Community level activities: Enhance community- and household-level flood resilient water harvesting facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these (USD 2,800,000)

This component focuses on enhancing community and household-level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these. The project intends to do this through a detailed community level spatial analysis of flood and drought risks and impacts to inform and develop community level plans, to train community members (especially women and youth) and to develop practical knowledge management products. Rainwater harvesting techniques used will be a combination of traditional techniques improved with (inter) national good practices to ensure water is clean / safe. The focus area is poor and informal settlements that are dependent on non-piped water sources (e.g. boreholes) that are contaminated.

Component 2: District / city level activities: Enhance city and district-level up-stream water harvesting facilities (that also reduce flood impacts down-stream) and strengthen capacities to plan, construct, operate, maintain and duplicate these (USD 1,500,000)

This component will focus on enhancing district and city-level up-stream water harvesting facilities (that will also be used to reduce flood impacts down-stream) and strengthen capacities to plan, construct, operate, maintain and duplicate these in areas suitable for tackling flood and drought issues at the same time. Under this component, government capacities will be strengthened to avoid people moving into high-risk areas. This will be done through the

development of spatial planning strategies / plans and to develop knowledge management products. Comprehensive rain water harvesting plans will be part of the spatial planning strategies

Component 3: National level activities: Strengthen national-level capacity to guide / direct city-level development considering climate change and disaster risks and impacts, especially floods and droughts. (USD 783,014)

This component will focus on strengthening national-level capacity to guide / direct city-level development considering climate change and disaster risks and impacts, especially floods and droughts. This will be done by improved policies and regulations that support reducing climate change urban-related flood and drought risks and impacts. This in turn will be done by developing a national urban strategy / policy and national guidelines for spatial planning strategies and building codes that considers climate change and disaster risks and impacts, especially floods and droughts (but also heat stress and storms). Moreover, recommendations will be made about how to enforce the river act in terms of reducing people moving into substantial risk areas.

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Project Concept

Country/Region: **Pakistan/ Asia Pacific**
Project Title: **Urban water harvesting and flood management nexus in Nowshera and Rawalpindi**
Thematic Focal Area: **Water Management**
Implementing Entity: **United Nations Human Settlements Programme (UN-Habitat)**
AF Project ID: **PAK/MIE/Urban/2018/1**
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): **USD 6,100,000**
Reviewer and contact person: **Alyssa Gomes (AFSEC)**
Co-reviewer(s): **Aloke Barnwal (GEFSEC)**
IE Contact Person:

Review Criteria	Questions	Comments	UN-Habitat response
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes.	
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes. As per German watch, Pakistan is frequently exposed to extreme climate-induced events such as droughts, floods, landslides, cyclonic activities, recession of glaciers, glacial lake outburst flooding (GLOF) and heat-waves that have led the country to rank amongst top ten most climate-affected countries on the Global Climate Risk Index. Additionally, the Asian Development Bank (ADB) forecasts high inter-annual variability of rainfall, sea level rise and increase in average temperature in coming years. Pakistan's Intended Nationally Determined Contributions (INDC) states that there is a huge potential for adaptation in Pakistan, particularly in strengthening and fortifying the flood infrastructure, including water reservoirs and water channels. This would also involve enhancing resilience of local communities to the adverse impacts of climate change.	
Project Eligibility	1. Has the	Yes	

	designated government authority for the Adaptation Fund endorsed the project/programme?	DA endorsement letter dating 31 July, 2018 has been attached.	
	2. 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?	The proposed project aims to develop a national urban strategy focused on addressing climate change impacts, especially flood and drought-related, in urban areas. It also intends to employ spatial planning strategies to achieve its goal. A comprehensive approach at the district, city and community level, using innovative technologies to reduce flood risks and water scarcity issues at the same time, is envisaged. (p.3) Please provide more information on the spatial planning elements in the concept proposal and demonstrate how these elements have been integrated across the various components. **CR1** Please clarify, what "flood resilient water harvesting and purification technology and facilities" in the context on this project means. **CR 2** The proposal would benefit from improvements on aspects such as: - a clear vulnerability assessment of the target regions - a clear link between the activities proposed and the vulnerabilities identified. Please provide additional information on the aforementioned points. **CR 3**	**CR 1:** An explanation about how the spatial planning elements are integrated across the various components has been inserted in the project document in part II.A – under component 3 section. Also, an explanation about the existing institutional structures for developing spatial strategies and how the project builds on these has been included. **CR 2:** flood resilient rainwater harvesting facilities refer to facilities that are designed / located in a way that these are not affected by floods. In the target areas, flood waters can rise four meters above the grounds, which means the storage tanks need to be located above these levels. Elevation level of the foundation will be determined based on flood levels of the locality. A tight-fitting covered for each tank to prevent evaporation, mosquito breeding and to keep insects, birds, lizards from entering the tanks. Simple and effective purification technology and facilities to be used. This includes "First Flush Device (initial flush of rainfall containing the majority of the contaminants running off the roof washes into the first flush down pipe) Filter Chamber (to get rid of solid particles such as leaves etc., multi-layered filter at down pipe level). In terms of chlorination, adding small quantities of chlorine manually to the water tank is the cheapest and most effective means of disinfection at domestic level. Communities will be educated,

			and orientation will be provided at the time of construction
		Please elaborate on the flooding related vulnerabilities in the target regions and establish the link of climate change with water quality and scarcity issues. **CR 4**	**CR 3:** vulnerability assessment information at the target region / city has been derived from national and district studies focused on the target districts / cities, NGO studies and consultations with representatives from the municipalities. Community level vulnerabilities have been identified through the consultations, where climate change impacts and effects on the communities, as well as barriers to adapt have been identified. Based on this, community members identified needs, on which the selected proposed activities are based – for details see tables 6 and 7 and annex 1 and 3. A link between increase of flood and drought and water scarcity has been made with the proposed interventions. Some paragraphs have been inserted in the project document part 1 Background and context – section target areas and population
		The proposal title mentions a nexus between water harvesting and flood management. However, the nexus is not explained and its link with improving adaptation efforts of national and local governments is also not clear. Please elaborate further on the nexus between water harvesting and flood management and clarify its link with improving adaptation efforts of national and local governments. **CR 5**	
		The target areas (Nowshera and Rawalpindi cities) and communities is identified based on "*a combination of flood and drought risks, government preferences and geographic locations that allow for upstream, higher elevation water harvesting and rooftop water harvesting options" (*p.7). The objective of the proposed climate change adaptation project is aimed at addressing water scarcity and flooding in the target areas.	**CR 4:** As shown in part 1. Background and context and annex 1 and 3, the target cities are heavily and increasingly affected by floods and drought. Floods, in turn, affect water availability and quality because boreholes (on which the poorest household depend) get flooded by flood water that is polluted by waste in drainage channels. This contaminates the groundwater, which becomes undrinkable, leading to water scarcity, even in the wet season. At the same time, droughts are increasing in the dry season and fresh water from glaciers reduce due to climate change. A paragraph has been inserted in the project document part 1 Background and context – section target areas and population
		Please provide additional information to strengthen the climate change adaptation reasoning to address vulnerabilities such as water borne diseases. **CR 6**	

			CR 5: The major cause of recurring flooding downstream is heavy runoff from the natural streams coming from the hills and overflow from the rivers. By harvesting water upstream, floods are reduced downstream. At the same time harvested water reduces vulnerability to water scarcity caused by floods (see explanation CR 4). The approach to reduce floods through reducing water coming down through water harvesting systems is especially relevant in dense urban areas, where space for drainage channels is limited. Water harvesting initiates in Pakistan are very limited, techniques not well developed and the link with reducing flood water not made at a time where flood and water scarcity issues are the main climate change related concerns in Pakistan (see consultations and national strategies). Therefore, taking an approach that tackles both issues at the same time is not only cost-effective but also required in an urban context. A paragraph has been inserted in the project document part 1 Background and context – section Approach of the proposal: problem and need and target areas and population. Moreover, as the title could be confusing, these has been changed. **CR 6:** As mentioned above, upstream water harvesting system both reduce vulnerabilities to floods and droughts / water scarcity issues at the community level (through grey water availability, e.g. for irrigation and toilets). To reduce vulnerabilities related to water scarcity and water borne diseases at the household level, rainwater harvesting systems will be installed at households above flood water levels, allowing households to access clean water directly. Major cause of water contamination causing health risks during floods in the target areas is the absence of effective solid

			waste management in the cities. Keeping this in view the project document proposes appropriate interventions including creating awareness on solid waste management. A paragraph has been inserted in the project document Part II.A – section on component 1
		In table 8, USD 2 million has been allocated towards *"enhancing community and household-level flood resilient water harvesting and purification technology and facilities*" (component 1); and USD 1.2 million will be allocated for "40 district / city-level water harvesting facilities (small reservoirs) constructed (or smaller number of bigger reservoirs are possible)". Table 6 and 7 specifically mention other concrete interventions such as rehabilitation of existing tube wells, construction of retaining walls and river embankments and water storage ponds river embankments etc. Please clarify *if* and under which component these concrete interventions might be developed. **CR 7** *At the full proposal stage*, please clearly specify all planned concrete interventions, including the number of envisaged interventions under each component. USD 2 million has been allocated for "5,000 community / household level flood resilient water harvesting and purification technology and facilities, using innovative techniques". The proposal indicates that an innovative water harvesting technology will be developed. Please clarify the innovative elements with respect to the development, management and longer-term sustainability of the planned intervention. **CR 8** Output 1.2 (USD 800,000) also incorporates pilot solid waste management centers. The obvious environmental	**CR 7:** Concrete interventions such as tube wells, construction of retaining walls, river embankments etc. as mentioned in table 6 and 7 are suggestions from community members consulted. However, these interventions will not be developed because of one or several of the following reasons: 1) government is already developing projects focused on river banks, 2) not feasible and / or cost-effective, 3) possible negative environmental or social risks / impacts (e.g. tube wells will be flooded), 3). Thus, the project will focus on community level and household level water harvesting systems. 'Notes' have been inserted under table 6 and 7. **CR 8:** Rainwater harvesting tanks will be designed to be operational not only in times of water availability as rain water harvesting tools but also usable in dry seasons with operational benefits of filtration over storage. This makes continues usage of tanks (no idle time) and ensures routine cleaning throughout the year. Methods such as "dry system", the collection pipe "drys" after each rain event since it empties directly into the top of the tank are easy to maintain and keep cleaner. Fixing in elevated foundation can provide easy access to operate sediment removal taps. A simple, graphically illustrated maintenance guidance manual will be provided to each house-hold with orientation at the time of installation. Services if field staff of

		benefits for such a system relate to mitigation such as the reduction of greenhouse gas emissions. Annex 5 mentions that rapid urbanization has resulted in an increase in the volume and complexity of solid waste. To solve the problem, a shift from the conventional end-of-the-pipe waste management system towards a resource management approach has been proposed. Please address the climate change adaptation rationale for piloting a solid waste management system (the Integrated Resource Recovery Centre (IRRC) model) under output 1.2. **CR 9**	Public Health Departments who are at presently engaged in inspections of houses in the communities to control spread of Dengue fever; may be utilized for routine inspection of rainwater harvesting tanks. Moreover, A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed: women and youth groups will management and maintain these facilities. Therefore, trainings will focus on these groups. Besides introducing rainwater harvesting technologies at household level, the same will also be developed at community scale. The target areas in both cities are densely populated. This leaves limited porous surfaces that could facilitate the seepage of rainwater to recharge aquifers. To address this problem, upstream water harvesting facilities will be constructed in public spaces without use, to reduce downstream flood impacts and to enhance water accessibility at the same time. To sustain these initiatives; policy and technical guidelines will be made part of respective spatial plans, building byelaws as well as national urban development policy and strategies. A paragraph has been inserted in the project document Part II.A – section on technical interventions component 1 and 2. Also, annex 4 includes more information on the proposed rainwater harvesting technology, why and where it is proven, why it is a good investment and possibilities to scale-up and maintain it? **CR 9** The national government (see consultation section) suggested to set-up Integrated Resource Recovery Centres at the community level to

			reduce waste in drainage channels with the purpose to reduce flood impacts and health issues. Currently, waste is often dumped in the drainage channels, leading to an increase of flooding and health issues (see figure 11). Because waste management should be part of the municipal budget, the project proposes to organize awareness raising campaigns about the impact of waste in drainage channels on floods and health. Thus, the set-up of proposed Integrated Resource Recovery Centres have been replaced by awareness raising campaigns. A paragraph has been inserted in Part II.A – section component 2.
	3. 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?	There is very limited information on specific benefits the communities will realize in the target regions of Rawalpindi and Nowshera. Please specify the environmental, economic and social benefits that vulnerable communities will enjoy. (p.32-33) **CR 10** Please clarify in the project concept, how, natural water sources such as underground water tables and ground wells will be better managed to reduce negative environmental impacts and ensure sustainability. **CR 11**	**CR 10:** The table 9 on benefits of project has been revised **CR 11:** Groundwater plays a vital role in irrigation, urban and rural water supplies and in sustaining ecological service, including the base flow of rivers. Due to water scarcity, the intense use of groundwater is becoming a source of concern as it is the ultimate water buffer. Making better use of groundwater through recharge, retention and reuse can reduce the impact of climate change. Underground water and ground wells can be best managed in Pakistan to ensure sustainability and adapt to climate change by following measures proposed in National Action Plan on Sustainable Consumption and Production. 1. Protect groundwater through management and technical measures like building dams for artificial recharge especially of threatened aquifers, and adopt concept of integrated water resources management. 2. Create awareness and promote rain-water-

			harvesting at household and local levels 3. Develop and implement groundwater regulatory framework to control and optimize groundwater extraction. 4. Initiate programmes for implementation of rules and monitoring of groundwater, including its quality, quantity, withdrawal and recharge potential. 5. Adopt participatory approach in water management that will engage all stakeholders particularly marginal groups. 6. Carry out periodic scientific monitoring of water aquifers and identify hot spot areas of contamination and their sources. The first two measures are in line with the proposed Adaptation Fund Project and will support sustainability of water accessibility. A paragraph has been inserted in Part II.B
	4. Is the project / programme cost effective?	The project primarily aims to address water quality and availability issues in the region. The proposal states that flooding and rising temperature exacerbate these conditions in the target regions. However, the evidence of this link is limited in the proposal and therefore the cost effectiveness of the adaptation fund is not very clear in the current concept note. In absence of this link, it could be argued that these issues ideally should be addressed by local and national governments from their urban development funds for providing water supply, water treatment and waste management services. Please provide evidence to strengthen the link between flooding/rising temperatures and water quality and availability. **CR 12** The concept proposal would benefit from: - Aligning the proposed interventions with existing	**CR 12:** Please also see response to CR 4 and 5. Flood can influence surface water quality because the rainwater picks up surface materials, soils, wastes and other pollutants in runoff from slopes, open grounds, lawns, farms, streets, factories, and other areas into the receiving water bodies. Contamination of large water bodies or groundwater through infiltration of flood water through pumps / wells, is often much higher during and immediately after rainstorms. Rising temperature increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas.[1] Both is the case in both target communities.

[1] Mosley, Luke M. "Drought impacts on the water quality of freshwater systems; review and integration." *Earth-Science Reviews* 140 (2015): 203-214.

		urban development policies of the target regions. - Clarify how AF could play a catalytic role in making urban service delivery effective by addressing key climate vulnerabilities, which may not be done in business as usual scenario. - Demonstrate alignment with existing urban developed policies in the target regions. **CR 13** The proposal aims to address the issues through three level of interventions- at national level through improved policies and guidelines; at district/city level through integrated planning and upstream catchment area treatment and long-term plans; and at community household level by installing water harvesting units in the houses. While the first two levels will have long term and systemic impact, the third level of intervention is not very clear in its impact. Please provide evidence on how these measures can improve the adaptive capacity of vulnerable communities in the target areas. **CR 14** Furthermore, the following questions related to water-harvesting units require deliberation: - How will the households be selected for installation of the water-harvesting units? - What about other households who may be facing similar issue? - Is the technology proposed, proven and tested in the target region? - Is there a strategy to scale up successful interventions? - What is the business model for the technology? - The diagram shows that water obtained is not potable and may require water purification. Will the investment in purifiers be sustainable and replicable? What are other technology alternatives - Can the funds support a community level impact? (p.33-35)	Target communities / households have little support from municipalities to access clean water because of the informal status of the community (i.e. no basic services). Tube wells have been dug by community members themselves but these are now a lost investment because of groundwater contamination. A paragraph has been inserted in Part II.C **CR 13:** The proposed AF Project will play a catalytic role in triggering paradigm shift by incorporating climate change concerns into the national and regional urban development strategy. It is pertinent to mention that, currently, all urban development related interventions in Pakistan are influenced by large scale standalone projects that have practically replaced the integrated and comprehensive plans. The proposed interventions aim to address this situation by catalysing the much needed development of national, provincial and local level urban development policies (currently non existing in Rawalpindi and Nowshera), strategies and plans with disaster risk reduction and climate change adaptation and mitigation mainstreamed in them. None of functional plans related to climate change or spatial planning exist for Rawalpindi or Nowshera. The disaster management plans of these cities do mention climate change. The AF project will address this situation by facilitating concerned institutions to develop climate and DRR sensitive spatial and sectoral plans. It is pertinent to mention that AF project's priorities are.aligned.with broader national plans and policies. Paragraph have been inserted in Part II.C and D.

			CR 14: Besides upstream water harvesting facilities (that also reduce flood impacts downstream) (output 2.1) vulnerabilities related to droughts / water scarcity and water borne diseases at the household level need to be addressed. Therefore, rainwater harvesting systems will be installed at households above flood water levels, allowing vulnerable (i.e. poor, informal, dependent on boreholes) households to access clean water directly. These households have no access to water because of the informal status of the community and high poverty incidences. Major cause of water contamination causing health risks during floods in the target areas is waste being dumped in the drainage channels, leading an increase of flooding and health issues since contaminated flood water enters boreholes and contaminate groundwater (see figure 11). A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed: women and youth groups will management and maintain these facilities. Therefore, trainings will focus on these groups. During the full proposal, the willingness to pay for these facilities will be assessed in detail and a model developed to save money for maintenance and replication of these facilities. A paragraph has been inserted in Part II.A – section component 1. Regarding the questions related to water-harvesting units that require deliberation, this has been done in annex 4.
		Please deliberate on the above questions and kindly demonstrate the cost effectiveness of the investment in	**CR 15:** A paragraph has been inserted in Part II.C. For more information see Part II.A,

		water-harvesting units. **CR 15**	background section and annex 4
	5. 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?	Yes. The project is aligned with INDC of Pakistan, National Water Policy and National Flood Protection Plan, which aim to address flooding, and water scarcity concerns in the country.	
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	Table 12 provides an overview of relevant national technical standards and how the project intends to comply with these.	

	7. Is there duplication of project / programme with other funding sources?	There are no duplications based on information provided in the proposal. However, the link of the program with the Government of Pakistan's proposed Dam project in Rawalpindi needs to be further strengthened. The Dam will have direct link with the flooding and water scarcity issues in the city and will directly influence the project. **CR 16**	**CR 16:** The project for the construction of the Cherah Dam in Rawalpindi was approved to be constructed on Soan River in 2009 as a joint venture of the Punjab government and the Capital Development Authority, with the former being the executing agency. The construction of the dam was approved by the Executive Committee of the National Economic Council with an estimated cost of Rs5.3 billion and was to be completed by 2013, according to its PC-1. The dam was to have a capacity of 15 million gallons a day (MGD), with the water being equally shared by Islamabad and Rawalpindi. However, It is pertinent to mention that so far there is no progress on ground for Chera Dam project as Government of Punjab wants to revise the PC-I and financing plan of the project. The construction of Cherah Dam will have no impact on the proposed AF Project interventions. The proposed location of the Cherah Dam and target areas are in opposite directions. Hence the target area will not be impacted by the construction of Cherah Dam. A paragraph has been inserted in Part II.G table 13.
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	The knowledge products listed are limited to the outputs of the activities only e.g. spatial plans, national strategy, technical manuals, etc. Please demonstrate *how* the project will capture feedback from beneficiaries and stakeholders on effectiveness of interventions (e.g. in form of surveys, case studies, policy briefs, research papers on key cross cutting issues facing the project, or other) and use the resulting knowledge to help inform local and national urban and climate change policies. **CR 17**	**CR 17:** Capturing lessons learned will be throughout the life of the project at multiple levels. Knowledge capturing will be centred on the case studies, beneficiary satisfactory surveys, stakeholder feedback sessions, research and issue papers and policy briefs. Good practices and key lessons learned of the project will be shared locally and nationally for policy dialogues. Knowledge products are shared nationally regionally and internationally at meetings, workshops, conferences and global knowledge networking events such as the World Urban

		At the full proposal stage, please provide specific details of the planned outputs under this component.	Forum. A paragraph has been inserted in Part II.H
	9. 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?	Not completed at this stage. Initial consultations have been taken place as mentioned in Annex 1. However, there are a number of proposed unidentified sub-projects. *During the full proposal development*, consultations will need to focus on fully identifying sub-projects and to identify all associated potential environmental and social risks and impacts through community consultations involving vulnerable groups. This information needs to be detailed in the full proposal.	During the full proposal development phase, all sub-project will be identified, including dimensions, costs, beneficiaries and potential environmental and social risks and impacts quantified. Vulnerable groups will be consulted through focus group discussions and the gender base and approach will be further developed.
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	The full cost of adaptation reasoning is not fully justified. This needs more evidence as commented in sections 2 and 4 under project eligibility. **CR 18**	**CR 18:** Please see response to sections 2 and 4 under project eligibility. Also, a paragraph has been inserted in Part II.J
	11. Is the project / program aligned with AF's results framework?	Yes, alignment with Fund level outcomes has been mentioned. *At the full proposal stage*, relevant clear project lifetime targets need to be provided e.g. no. of direct beneficiaries (including percentage of women), no. of physical assets improved or developed, no. of EWS, natural habitats protected/restored. Please use quantitative numbers (where possible) to measure and targets and verifications of the project. For example, please specify the number of planned activities (trainings) with the government and local communities. These numbers will become a benchmark for future project evaluation**.**	During the full proposal development phase targets in terms of direct beneficiaries, including for women and assets, etc. will be included
	12. Has the sustainability of the project/programm	The sustainability at national and district level is relatively clear. However, the sustainability of community level activities is not very clear. Please clarify how the longer-term sustainability of planned interventions at the community	**CR 19:** A Settlement WASH Committee (SWC) will be formulated is an inclusive group of elected community members from the rainwater harvesting households to a) monitor the usage of

	e outcomes been taken into account when designing the project?	level may be achieved e.g. development of Water User Associations (WUA), a community-based business planning model, training of project beneficiaries (including women) to develop and maintain technology. **CR 19**	rain water facilities in their settlements, b) discuss WASH development issues faced by the entire community c) seek support from city authorities. SWCs, as they are elected directly by the people are answerable and accountable to the people who elected them. Through tools like mass meeting and social audit business plans for maintenance and replacements of systems, representatives keep communities informed about the implementation of their decisions and status of resource utilization. SWCs will be registered with city authorities to create institutional linkages, make rainwater harvesting as a part of city water supply programme. It is encouraged women participation in SWCs. Community training will be provided to SWCs and operations manual for SWC will be developed and orientation will provided. Moreover, A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed: women and youth groups will management and maintain these facilities. Therefore, trainings will focus on these groups. A paragraph has been inserted in Part II.K
	13. 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?	Not completed at this stage. USPs may be justified for component 1, but it is not clear whether they would be justified for component 2, so ESMP is required with ESP review mechanism to be applied during implementation. Risks related to the technology intervention are highlighted however the overall risks from the program are not provided. It is proposed for the full proposal stage. <u>*During the full proposal development*</u>, - The ESP risks identification included in the annex should be specified and include project-specific	During the full proposal development phase, all sub-project will be identified

		information. - Section II.K is largely consistent with the USP approach, but needs to be explicit about the USP approach, to ensure credibility of the risks identification that is described to be undertaken during full project formulation. - This should be evidence based and in line with national technical standards and community and vulnerable groups consultations.	
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	The project exceeds the total 10 million-country cap by USD 6,000. The previously approved GLOF project (2010) was USD 3,906,000. Please revise the project-funding amount to ensure it is at or below the 10 million-country cap. **CAR 1**	**CAR 1:** The total amount of financing requested has been reduced by USD 6000 in table 8.
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes at 8.5%. Please see the previous comment.	The Implementing Entity Management Fee has been reduced taken the USD 6000 reduction of the total amount of financing requested
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the	Yes at 9.5%. Please note the previous comment, CAR 1.	The Project Execution Cost has been reduced taken the USD 6000 reduction of the total amount of financing requested

	fee)?		
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes, UN-Habitat is an accredited implementing entity of the Fund.	
Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	n/a at concept stage	
	2. Are there measures for financial and project/programme risk management?	n/a at concept stage	
	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?	n/a at concept stage	
	4. Is a budget on the Implementing Entity Management Fee	n/a at concept stage	

	use included?		
	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage	
	6. Is a detailed budget including budget notes included?	n/a at concept stage	
	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?	n/a at concept stage	
	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?	n/a at concept stage	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least	n/a at concept stage	

	one core outcome indicator from the Fund's results framework?		
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage	

Technical Summary	The project titled, "Urban water harvesting and flood management nexus in Nowshera and Rawalpindi" primarily aims to address the water quality and availability issues in the region. To tackle flooding and rising temperature that exacerbate these conditions in the target regions, the project aims to develop a national urban strategy focused on addressing climate change impacts, especially flood and drought-related, in urban areas. It also intends to employ spatial planning strategies to achieve its goal. The proposal aims to achieve its objectives through the following components: **Component 1:** Community level activities to enhance community- and household-level flood resilient water harvesting and purification technology and facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these. **Component 2:** District/ city level acitivities to enhance city and district-level up- stream water harvesting facilities (that also reduce flood impacts down-stream) and strengthen capacities to plan, construct, operate, maintain and duplicate these. **Component 3:** National level activities to strengthen national-level capacity to guide / direct city- level development considering climate change and disaster risks and impacts, especially floods anddroughts. The initial technical review finds the project concept to be promising and presents a good opportunity to enhance the resilience of local communities in Nowshera and Rawalpindi to the adverse impacts of floods and water scarcity. However, it lacks concrete evidence on how measures envisaged at the community level can improve the adaptive capacity of the most vulnerable communities in the target region. Additionally, the revised concept proposal would benefit from establishing clear linkages between the different components. The following Correct Action (CAR) and Clarifying Requests (CRs) are requested: **Corrective Action Requests (CAR)**

	- **CAR 1:** The project exceeds the total 10 million-country cap by USD 6,000. The previously approved GLOF project (2010) was USD 3,906,000. Please revise the project-funding amount to ensure it is at or below the 10 million-country cap. **Clarification Requests (CRs)** - **CR 1:** Please provide more information on the spatial planning elements in the concept proposal and demonstrate how these elements have been integrated across the various components. - **CR 2:** Please clarify, what "flood resilient water harvesting and purification technology and facilities" in the context on this project means. - **CR 3:** Please provide a clear overview of the vulnerability assessment in specified target regions and clarify the link between the activities proposed and the identified vulnerabilities. - **CR 4:** Please elaborate on the flooding related vulnerabilities in the target regions and clarify the link between climate change and water quality and scarcity issues - **CR 5:** Please elaborate further on the nexus between water harvesting and flood management and; clarify its link with improving adaptation efforts of national and local governments. - **CR 6:** The climate change adaptation reasoning of interventions to address vulnerabilities such as water borne disease needs to be further justified. - **CR 7:** In Table 8, please clarify under which component the concrete interventions mentioned in tables 6 and 7, are envisaged . - **CR 8:** The proposal indicates that an innovative water harvesting technology will be developed. Please clarify the innovative elements with respect to the development, management and longer-term sustainability of the planned intervention. - **CR 9:** Please address the climate change adaptation rationale for incorporating a solid waste management system (the Integrated Resource Recovery Centre (IRRC) model) under output 1.2. - **CR 10:** Please specify the enjoy environmental, economic and social benefits that vulnerable communities will enjoy. - **CR 11:** Please clarify in the project concept, how, natural water sources such as underground water tables and ground wells will be better managed to reduce negative environmental impacts. - **CR 12:** Please provide evidence to strengthen the link between flooding/rising temperatures and water quality and availability. - **CR 13:** Please demonstrate alignment with existing urban developed policies in the target regions and clarify how the AF could play a catalytic role in making urban service delivery effective by addressing key climate vulnerabilities. - **CR 14:** Please provide evidence on how community level adaptation measures can improve the adaptive capacity of vulnerable communities in the target areas.

	- **CR 15:** The concept needs to deliberate on the questions raised under CR 15 more, to clearly justify the cost effectiveness of the investment in water-harvesting units. - **CR 16:** There are no duplications based on information provided in the proposal. However, the link of the program with the Government of Pakistan's proposed Dam project in Rawalpindi needs to be further strengthened. The Dam will have direct link with the flooding and water scarcity issues in the city and will directly influence the project. - **CR 17:** Please demonstrate how the project will capture feedback from beneficiaries and stakeholders on effectiveness of interventions (E.g. surveys, case studies, policy briefs, research papers on key cross cutting issues facing the project) and utilise the learnings and inform local and national urban and climate change policies. - **CR 18:** The full cost of adaptation reasoning is not fully justified. Needs more evidence as commented in sections 2 and 4 under "project eligibility". - **CR 19:** Please clarify how the longer-term sustainability of planned interventions at the community level may be achieved. E.g. development of Water User Associations (WUA), a community based business planning model, training of project beneficiaries (including women) to maintain technology. A few recommendations have also been made for the full proposal stage.
Date:	08/18/2018

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: REGULAR SIZE CONCEPT PROPOSAL

Country/Region: **Pakistan/ Asia Pacific**
Project Title: **Enhance community and local and national-level government capacities to address climate change interrelated urban flood and drought risks and impacts**
Thematic Focal Area: **Water Management**
Implementing Entity: **United Nations Human Settlements Programme (UN-Habitat)**
AF Project ID: **PAK/MIE/Urban/2018/1**
IE Project ID: Requested Financing from Adaptation Fund (US Dollars): **USD 6,094,000**
Reviewer and contact person: **Alyssa Gomes (AFBSEC)** Co-reviewer(s): **Aloke Barnwal (GEFSEC)**
IE Contact Person:

Review Criteria	Questions	Comments on 20 August 2018	Comments on 10 September 2018
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes.	-
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes. As per Germanwatch, Pakistan is frequently exposed to extreme climate-induced events such as droughts, floods, landslides, cyclonic activities, recession of glaciers, glacial lake outburst flooding (GLOF) and heat-waves that have led the country to rank amongst top ten most climate-affected countries on the Global Climate Risk Index. Additionally, the Asian Development Bank	-

		(ADB) forecasts high inter-annual variability of rainfall, sea level rise and increase in average temperature in coming years. Pakistan's Intended Nationally Determined Contributions (INDC) states that there is a huge potential for adaptation in Pakistan, particularly in strengthening and fortifying the flood infrastructure, including water reservoirs and water channels. This would also involve enhancing resilience of local communities to the adverse impacts of climate change.	
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes DA endorsement letter dating 31 July, 2018 has been attached.	-
	2. 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?	The proposed project aims to develop a national urban strategy focused on addressing climate change impacts, especially flood and drought-related, in urban areas. It also intends to employ spatial planning strategies to achieve its goal. A comprehensive approach at the district, city and community level, using innovative technologies to reduce flood risks and water scarcity issues at the same time, is envisaged. (p.3)	**CR 1: Partially Addressed** An explanation is provided with names of specific institutions who will engage in the spatial planning activity (page 36). City and district level spatial planning *strategies* are to be developed under component 2 (page 34) and national *guidelines* for spatial planning *strategies* and building codes will be developed under component 3 (page 35), that consider climate change and disaster risks and impacts,

		Please provide more information on the spatial planning elements in the concept proposal and demonstrate how these elements have been integrated across the various components. **CR1** Please clarify, what "flood resilient water harvesting and purification technology and facilities" in the context on this project means. **CR 2**	especially floods and droughts (but also heat stress and storms). Outputs 2.2 and 3.2 reflect the above. The set of National guidelines for spatial / urban planning will be developed using the approaches and practical lessons learned at the community level (output 1.2) and city level (output 2.2). (Page 35). At the local level, *functional plans* related to climate change or spatial planning exist for Rawalpindi or Nowshera, however the disaster management plans of these cities do mention climate change. The AF project aims to address this situation by facilitating concerned institutions to develop climate and DRR sensitive spatial and sectoral *plans* (page 52). From the information presented in the various sections of the document lacks consistency and hence, it is not very clear still on whether actual spatial planning will be developed in the two cities or the AF project will develop a strategy for spatial planning. It would seem intuitive that, spatial planning considering

		The proposal would benefit from improvements on aspects such as: - a clear vulnerability assessment of the target regions - a clear link between the activities proposed and the vulnerabilities identified. Please provide additional information on the aforementioned points. **CR 3**	climate risks needs to be done in these cities to inform the design and location of water harvesting structures at city level and household level. The concept needs to clarify this approach. **CR 1** **CR 2: Addressed** Flood resilient water harvesting facilities are defined as structures that are elevated so as to not be affected by contaminated flood water. **CR 3: Partially Addressed** The proposal needs to further strengthen the link of proposed activities with target vulnerabilities and provide a clear linkage between the proposed components and outputs. **CR 2** It appears that access to clean drinking water is the main issue and the three components propose adaptation activities around this issue. - 3 Potential sites for small dams/reservoirs/ lakes have been identified (at the foothills of Margallah hills) over 3 perennial streams for direct water

			harvesting purposes or for recharging the ground water thus raising the water table down the stream (page 40-41). To reduce flood impacts in the same areas, upstream water harvesting options that also reduce downstream floods are proposed. To address drought / water scarcity issues affecting the vulnerable target community / households, rainwater harvesting systems is proposed. However, in number of places there have been references to reduction in household assets loss, reduction in vulnerabilities of businesses, etc. The concept proposal needs to deliberate on the following points - The overall assumption of the project is that water harvesting will lead to improved management of flooding and droughts. This is likely to be challenged given that other measures such as

			weather information system, strengthening drainage networks, other upstream interventions such as afforestation, etc. are not mentioned (even as complementary activities by the government). - If indeed water-harvesting facilities is the core activity of the project, the project would benefit from clarifying the long-term aspiration of the water harvesting facilities. While rain water harvesting structures is a cost-effective climate change adaptation solution, what happens if the informal communities are connected to piped water in the future? - The proposal has identified three potential sites for dams. Given the inherent environmental and social risks associated with building dams and reservoirs, the full proposal would need to conduct and demonstrate an evidence-

			based risk assessment and ESMP. - Provide scientific evidence /clarify the rationale for building dams and the linkage with water availability for downstream communities in the target areas.**CR 3** The following points related to interventions focused on aquifer recharge upstream need to clarified: - If there is evidence from hydrological modelling conducted that may point towards any connectivity between aquifers recharged upstream and contaminated water tables downstream. - Clear identification of intended users of ground water (upstream and downstream). Irrigation is mentioned in a few places in the revised concept proposal. Please clarify, if this is the case upstream. - For aquifers that will be recharged upstream, please identify where contamination can occur and what measures can

		Please elaborate on the flooding related vulnerabilities in the target regions and establish the link of climate change with water quality and scarcity issues. **CR 4** The proposal title mentions a nexus between water harvesting and flood management. However, the nexus	be put in place to prevent, reduce or eliminate contaminants/ nitrate from fertilizers or manures and pesticides used in agriculture from seeping into the aquifer. (control measures). **CR 4** **CR 4: Partially Addressed** That boreholes are not usable due to flooding is well understood and therefore the proposed household level rainwater harvesting structures, can be considered as an adaptation option. However, the proposal does not adequately address water contamination which is a main challenge**.** The water harvesting structures proposed in the upstream may be able to reduce runoff but needs further justification on how it might address contamination. The proposal needs to clarify if there are any complementary measures proposed to reduce contamination. While water purification has been proposed, there are questions related to if it

		is not explained and its link with improving adaptation efforts of national and local governments is also not clear. Please elaborate further on the nexus between water harvesting and flood management and clarify its link with improving adaptation efforts of national and local governments. **CR 5** The target areas (Nowshera and Rawalpindi cities) and communities is identified based on "*a combination of flood and drought risks, government preferences and geographic locations that allow for upstream, higher elevation water harvesting and rooftop water harvesting options".(*p.7). The objective of the proposed climate change adaptation project is aimed at addressing water scarcity and flooding in the target areas. Please provide additional information to strengthen the climate change adaptation reasoning to address vulnerabilities such as water borne diseases. **CR 6**	may be able to solve the root cause and if it is sustainable in long term. **CR 5** **CR5: Not Addressed** The proposed core intervention is water harvesting and the ultimate goal is urban adaptation. The new proposed title, '*Enhance community and local and national-level government capacities to address climate change-interrelated urban flood and drought risks and impacts',* falls short of clearly reflecting the program objective. Strengthening capacity could be argued as being seen as a means and not the final objective. **CR 6: Partially Addressed** Waterborne diseases may happen even without climate extremes due to ineffective waste management (both solid and sewage). Under component 1.2, the project aims to conduct awareness raising activities on waste management at the community level. The project would benefit from clearly demonstrating how this

			activity would complement ongoing initiatives on waste management to ensure sustainability of interventions. **CR 6**
		In table 8, USD 2 million has been allocated towards *"enhancing community and household-level flood resilient water harvesting and purification technology and facilities*" (component 1); and USD 1.2 million will be allocated for "40 district / city-level water harvesting facilities (small reservoirs) constructed (or smaller number of bigger reservoirs are possible)". Table 6 and 7 specifically mention other concrete interventions such as rehabilitation of existing tube wells, construction of retaining walls and river embankments and water storage ponds river embankments etc. Please clarify *if* and under which component these concrete interventions might be developed. **CR 7** *At the full proposal stage*, please clearly specify all planned concrete interventions, including the number of envisaged interventions under	**CR 7: Addressed** On page 27, it is mentioned that identified possible concrete interventions such as retaining walls and embankment were suggestions from community members consulted but will not be developed because of one or several of the following reasons: 1) government is already developing projects, 2) not feasible and / or cost-effective, 3) possible negative environmental or social risks /

		each component. USD 2 million has been allocated for “5,000 community / household level flood resilient water harvesting and purification technology and facilities, using innovative techniques”. The proposal indicates that an innovative water harvesting technology will be developed. Please clarify the innovative elements with respect to the development, management and longer-term sustainability of the planned intervention. **CR 8** Output 1.2 (USD 800,000) also incorporates pilot solid waste management centers. The obvious environmental benefits for such a system relate to mitigation such as the reduction of greenhouse gas emissions. Annex 5 mentions that rapid urbanization has resulted in an increase in the volume and complexity of solid waste. To solve the problem, a shift from the conventional end-of-the-pipe waste management system towards a resource management approach has been proposed.	impacts (e.g. tube wells will be flooded), 3). Thus, the project will focus on community level and household level water harvesting systems. **CR 8: Addressed** As per information provided on page 56 and Annex 4. **CR 9: Addressed** This activity has been changed to focus on community awareness raising campaigns.

		Please address the climate change adaptation rationale for piloting a solid waste management system (the Integrated Resource Recovery Centre (IRRC) model) under output 1.2. **CR 9**	
	3. 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?	There is very limited information on specific benefits the communities will realize in the target regions of Rawalpindi and Nowshera. Please specify the environmental, economic and social benefits that vulnerable communities will enjoy. (p.32-33) **CR 10** Please clarify in the project concept, how, natural water sources such as underground water tables and ground wells will be better managed to reduce negative environmental impacts and ensure sustainability. **CR 11**	**CR 10: Addressed** As per information provided in Table 9. **CR 11: Partially Addressed.** Upstream water harvesting tanks can reduce runoff and overflowing of drains in the cities. However, there is a need to demonstrate hydrological modelling to clarify connectivity between upstream and downstream water tables. See also points mentioned in (new) *CR 4.* The six actions proposed looks good and all are vital for adaptation. The proposal focuses on only the first two. (Page 47).

			Please clarify if recharge is indeed a focus of the proposal. It has been touched upon occasionally (especially with respect to upstream groundwater recharge activities) but there is a lack of a clear outcome or output. **CR 7**
	4. Is the project / programme cost effective?	The project primarily aims to address water quality and availability issues in the region. The proposal states that flooding and rising temperature exacerbate these conditions in the target regions. However, the evidence of this link is limited in the proposal and therefore the cost effectiveness of the adaptation fund is not very clear in the current concept note. In absence of this link, it could be argued that these issues ideally should be addressed by local and national governments from their urban development funds for providing water supply, water treatment and waste management services. Please provide evidence to strengthen the link between	**CR 12: Addressed** At full proposal stage, it would be good to quote any relevant studies/evidence on how water

		flooding/rising temperatures and water quality and availability. **CR 12** The concept proposal would benefit from: - Aligning the proposed interventions with existing urban development policies of the target regions. - Clarify how AF could play a catalytic role in making urban service delivery effective by addressing key climate vulnerabilities, which may not be done in business as usual scenario. - Demonstrate alignment with existing urban developed policies in the target regions. **CR 13** The proposal aims to address the issues through three level of interventions- at national level through improved policies and guidelines; at district/city level through integrated planning and upstream catchment area treatment and long-term plans; and at community household level by installing water harvesting units in the houses. While the first two levels will have long term and	quality of boreholes have been degraded due to flooding. **CR 13: Partially Addressed** The proposed intervention at city level is sector and technology specific, instead of an integrated approach. The concept proposal would benefit from strengthening the integrated approach. E.g. Through focusing on spatial planning which is then used to - identify water management structures, recommend on other critical interlinked structures and propose policies and regulations. **CR 8** **CR 14: Partially Addressed** If the major cause of flooding and diseases is dumping of waste in drainage channels, there is the issue that interventions may have little and short-term impact only.

		systemic impact, the third level of intervention is not very clear in its impact. Please provide evidence on how these measures can improve the adaptive capacity of vulnerable communities in the target areas. **CR 14** Furthermore, the following questions related to water-harvesting units require deliberation: - How will the households be selected for installation of the water-harvesting units? - What about other households who may be facing similar issue? - Is the technology proposed, proven and tested in the target region? - Is there a strategy to scale up successful interventions? - What is the business model for the technology? - The diagram shows that water obtained is not potable and may require water purification. Will the investment in purifiers be sustainable and replicable? What are other technology	**CR 15: Addressed** Target communities / households for rainwater harvesting systems are those that have little support from municipalities to access clean water because of the informal status of the community (i.e. no basic services). Tube wells had been dug by community members themselves, but these are now a lost investment because of groundwater contamination (page 40). Therefore, to address drought / water scarcity issues affecting the vulnerable target community / households, funding of innovative rainwater harvesting systems is proposed. (Page 71) Annex 4 - Water harvesting and drinking water cleaning techniques and approach on pages 119-120 further details

		alternatives - Can the funds support a community level impact? (p.33-35) Please deliberate on the above questions and kindly demonstrate the cost effectiveness of the investment in water-harvesting units. **CR 15**	information on the selection criteria, proposed technology, scaling up strategy and business model for water harvesting and purification technologies. <u>At the full proposal stage,</u> affordable but effective water purification technologies taking due guidance from successful experiences from around the world should be specified.
	5. 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?	Yes. The project is aligned with INDC of Pakistan, National Water Policy and National Flood Protection Plan, which aim to address flooding, and water scarcity concerns in the country.	-
	6. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and	Table 12 provides an overview of relevant national technical standards and how the project intends to comply with these.	-

	Social Policy of the Fund?		
	7. Is there duplication of project / programme with other funding sources?	There are no duplications based on information provided in the proposal. However, the link of the program with the Government of Pakistan's proposed Dam project in Rawalpindi needs to be further strengthened. The Dam will have direct link with the flooding and water scarcity issues in the city and will directly influence the project. **CR 16**	**CR 16: Addressed** The construction of Cherah Dam will have no impact on the proposed AF Project interventions. The proposed location of the Cherah Dam and target areas are in opposite directions. Hence the target area will not be impacted by the construction of Cherah Dam. A paragraph has been inserted in Part II.G table 13. (Page 63-64)
	8. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	The knowledge products listed are limited to the outputs of the activities only e.g. spatial plans, national strategy, technical manuals, etc. Please demonstrate *how* the project will capture feedback from beneficiaries and stakeholders on effectiveness of interventions (e.g. in form of surveys, case studies, policy briefs, research papers on key cross cutting issues facing the project, or other) and use the resulting knowledge to help inform local and national urban and climate change policies. **CR 17**	**CR 17: Addressed** Knowledge capturing will be centred on the case studies, beneficiary satisfaction surveys, stakeholder feedback sessions, research and issue papers and policy briefs. Good practices and key lessons learned of the project will be shared locally and nationally for policy dialogues. Knowledge products will be shared nationally regionally and internationally at meetings, workshops, conferences and global knowledge networking events such as the World Urban Forum. A paragraph has been

		At the full proposal stage, please provide specific details of the planned outputs under this component.	inserted in Part II.H. (Page 69). *At full proposal stage*, these need to be reflected in outputs. In the concept proposal, the knowledge outputs are same as outputs of program components.
	9. 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?	Not completed at this stage. Initial consultations have been taken place as mentioned in Annex 1. However, there are a number of proposed unidentified sub-projects. *During the full proposal development*, consultations will need to focus on fully identifying sub-projects and to identify all associated potential environmental and social risks and impacts through community consultations involving vulnerable groups. This information needs to be detailed in the full proposal.	
	10. Is the requested financing justified on the basis of full cost of adaptation reasoning?	The full cost of adaptation reasoning is not fully justified. This needs more evidence as commented in sections 2 and 4 under project eligibility. **CR 18**	**CR 18: Addressed**
	11. Is the project / program aligned with AF's results framework?	Yes, alignment with Fund level outcomes has been mentioned. *At the full proposal stage*, relevant clear project lifetime targets need	-

		to be provided e.g. no. of direct beneficiaries (including percentage of women), no. of physical assets improved or developed, no. of EWS, natural habitats protected/restored. Please use quantitative numbers (where possible) to measure and targets and verifications of the project. For example, please specify the number of planned activities (trainings) with the government and local communities. These numbers will become a benchmark for future project evaluation**.**	
	12. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	The sustainability at national and district level is relatively clear. However, the sustainability of community level activities is not very clear. Please clarify how the longer-term sustainability of planned interventions at the community level may be achieved e.g. development of Water User Associations (WUA), a community-based business planning model, training of project beneficiaries (including women) to develop and maintain technology. **CR 19**	**CR 19: Addressed** A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed: women and youth groups will management and maintain these facilities. Therefore, trainings will focus on these groups. A paragraph has been inserted in Part II.K (Page 38, 82) and mentioned in Annex 4.
	13. Does the project / programme provide an overview of environmental and social impacts / risks	Not completed at this stage. USPs may be justified for component 1, but it is not clear whether they would be justified for	

	identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	component 2, so ESMP is required with ESP review mechanism to be applied during implementation. Risks related to the technology intervention are highlighted however the overall risks from the program are not provided. It is proposed for the full proposal stage. *During the full proposal development*, - The ESP risks identification included in the annex should be specified and include project-specific information. - Section II.K is largely consistent with the USP approach, but needs to be explicit about the USP approach, to ensure credibility of the risks identification that is described to be undertaken during full project formulation. - This should be evidence based and in line with national technical standards and community and vulnerable groups consultations.	

Resource Availability	1. Is the requested project / programme funding within the cap of the country?	The project exceeds the total 10 million-country cap by USD 6,000. The previously approved GLOF project (2010) was USD 3,906,000. Please revise the project-funding amount to ensure it is at or below the 10 million-country cap. **CAR 1**	**CAR 1: Addressed** The revised total requested amount is USD 6,094,000
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	Yes at 8.5%. Please see the previous comment.	Yes
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	Yes at 9.5%. Please note the previous comment, CAR 1.	Yes
Eligibility of IE	4. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	Yes, UN-Habitat is an accredited implementing entity of the Fund.	-
Implementation Arrangements	1. Is there adequate arrangement for project	n/a at concept stage	-

	/ programme management, in compliance with the Gender Policy of the Fund?		
	2. Are there measures for financial and project/programme risk management?	n/a at concept stage	-
	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?	n/a at concept stage	-
	4. Is a budget on the Implementing Entity Management Fee use included?	n/a at concept stage	-
	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage	-
	6. Is a detailed budget including budget notes included?	n/a at concept stage	-
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans	n/a at concept stage	-

	and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?		
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a at concept stage	-
	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?	n/a at concept stage	-
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage	-

Technical Summary	The project (re)titled, "Enhance community and local and national-level government capacities to address climate change-interrelated urban flood and drought risks and impacts" primarily aims to address the water quality and availability issues in the region. To tackle flooding and rising temperature that exacerbate these conditions in the target regions, the project aims to develop a national urban strategy focused on addressing climate change impacts, especially flood and drought-related, in urban areas. It also intends to employ spatial planning strategies to achieve its goal.

	The proposal aims to achieve its objectives through the following components: **Component 1:** Community level activities to enhance community- and household-level flood resilient water harvesting and purification technology and facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these. **Component 2:** District/ city level activities to enhance city and district-level up- stream water harvesting facilities (that also reduce flood impacts downstream) and strengthen capacities to plan, construct, operate, maintain and duplicate these. **Component 3:** National level activities to strengthen national-level capacity to guide / direct city- level development considering climate change and disaster risks and impacts, especially floods and droughts. The initial technical review found the project concept to be promising and that it presented a good opportunity to enhance the resilience of local communities in informal settlements in Nowshera and Rawalpindi to the adverse impacts of floods and water scarcity. However, it lacked concrete evidence on how measures envisaged at the community level can improve the adaptive capacity of the most vulnerable communities in the target region. Additionally, the concept proposal falls short of establishing clear linkages between the different components and a theory of change. 19 Clarifying Requests (CRs) and a Corrective Action Request (CAR) were requested. The final technical review finds that the proposed project concept has made a good effort in identifying vulnerabilities in the target regions of Nowshera and Rawalpindi, proposes potential innovative technology and a community-based business model, has proposed a community engagement approach and looks at local and national level policy linkages. However, it needs to be improved in the following aspects - it needs to consider providing clear scientific evidence for some the interventions proposed such as 3 dams, groundwater recharge etc. The concept proposal would also benefit from being more focused on how resources will be deployed, avoiding redundancies and providing clear linkages between the three components. It could be strengthened in terms of demonstrating more community engagement and ownership. There might be a potential for private sector engagement to scale up benefits leading to transformational impacts. The corrective action request (CAR) was addressed but the following clarification requests (CRs) need to be adequately addressed: **(A) Clarification requests (CRs)** ● **CR1:** The concept needs to clarify whether actual spatial planning will be done in the two cities or the AF project will develop a *strategy* for spatial planning. ● **CR 2:** The proposal needs to further strengthen the link of proposed activities with target vulnerabilities and provide a clear linkage between the proposed components and outputs. In this context, the proposal

	needs to be consistent on the rationale of climate vulnerability considering that waste management is a major issue in the two cities. ● **CR 3:** The project needs to clearly demonstrate evidence of the impact of the proposed dams on controlling flood downstream and highlight its potential impact upstream on biodiversity, re-settlement etc. ● **CR 4:** Interventions focused on aquifer recharge upstream needs to be clarified with scientific evidence/hydrological modelling. Furthermore, there is a need to clarify if/if not there is connectivity between upstream and downstream (contaminated) water tables. ● **CR 5:** Please clarify if there are any complementary measures proposed to reduce contamination of ground water. ● **CR 6:** The project would benefit from clearly demonstrating how the awareness raising activity related to waste management would complement ongoing initiatives on waste management to ensure sustainability of interventions. ● **CR7:** Clarify if recharge is indeed a focus of the proposal. It has been touched upon occasionally (especially with respect to upstream groundwater recharge activities) but there is a lack of a clear outcome or output. ● **CR 8:** The concept proposal needs to demonstrate how it will strengthen the integrated approach. A few recommendations have also been made for the full proposal stage.
Date:	09/10/2018

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

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

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

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

Complete documentation should be sent to:

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

ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Enhance community and local and national-level government capacities to address climate change-interrelated urban flood and drought risks and impacts.
Country:	Pakistan
Type of Implementing Entity:	Multilateral
Implementing Entity:	United Nations Human Settlements Programme
Executing Entities:	National level: - Ministry of Climate Change – through establishment of PMU; NDMA - Ministry of Water Resources Local level: - Concerned provincial and district departments including Provincial and district disaster management authorities - Municipal Corporation Rawalpindi and Municipal Committee/Tehsil Municipal Administration Nowshera Community level: - SheherSaaz NGO - Concerned Union Councils/administration - Community based organizations and citizen groups in target communities
Amount of Financing Requested:	USD 6,1 million

1. Project Background and Context

Approach of the proposal: problem and need

Reducing flood and drought (i.e. water scarcity) issues are evolving as a government top-priority.[2] Therefore, the government of Pakistan (through the AF designated authority) requested UN-Habitat to align project objectives and targets with

RAWALPINDI: People living in slums like this one established along the bank of Nullah Leh in Dhoke Ratta are in serious danger of floods during monsoon — Khalid Rais

Figure 1: News article July 2018. Heading: Rawalpindi: people living in slums like this one established along the banks of Nullah Let in Dhoke Ratta are in serious danger of floods during monsoon

2 See section D (analysis of national priorities / strategies and section H (outcomes consultations with government stakeholders).

government priorities, especially those in the new National Water Policy (2018) and National Flood Protection Plan (2016).[3] Even though flood impacts and drought / water scarcity issues are often particularly severe in high density (i.e. urban) areas,[4] a national approach / strategy to address this specifically in urban areas does not exist in Pakistan. Besides that, there is a lack of approaches that deal with flood impacts and related drought / water scarcity issues in a comprehensive manner and water harvesting techniques are often not effective.

While water scarcity is increasing due to increase of droughts and melting glaciers (see table 3) there is also a relation between floods and water scarcity issues, especially in urban areas: floods can contaminate groundwater and thus affect people dependent on water pumps, because flood water enter these pumps (see figure 11). This flood water is often contaminated because of waste in drainage channels. By harvesting water upstream flood impacts can be reduced downstream. At the same time, upstream harvested water can reduce vulnerability to droughts and water scarcity caused by floods. The approach to reduce floods through reducing water coming down through water harvesting systems is especially relevant in dense urban areas, where space for drainage channels is limited. Water harvesting initiates in Pakistan are very limited, techniques not well developed and the link with reducing flood impacts not made at a time where flood and drought / water scarcity issues are the main climate change related concerns in Pakistan. Therefore, taking an approach that tackles both issues at the same time is not only cost-effective but also required in an urban context.

As highlighted in Pakistan's Intended Nationally Determined Contributions (INDC): 'There is a huge potential for adaptation in Pakistan, particularly in strengthening and fortifying the flood infrastructure, including water reservoirs and water channels. This would involve enhancing resilience of local communities to the adverse impacts of climate change.'[5]

To enable the Pakistan government to respond to above issues, this project will focus on developing a national urban strategy focused on addressing climate change impacts, especially flood and drought-related, in urban areas, also through spatial planning strategies. At the district, city and community level, a comprehensive approach will be taken to reduce flood risks and water scarcity issues at the same time. Innovative techniques will be used to do this.

Geographic / demographic context

Pakistan has a common border with China, India, Afghanistan and Iran. Pakistan is well known for its geographic as well as climatic variability. A high altitude mountainous region, with several peaks over 8,000 meters, and deserts cover around 14 percent of the country's total landmass. The coastline in the south stretches about 990 kilometres. The presence of 5,000 glaciers makes it one of the most glacially populated regions in the world outside the polar region.

With the current (2018) population estimated to be around 207 million, Pakistan is the fifth-most-populous country of the world.[6]The population has grown with 80 million people since 2000 and could double again by 2050, putting catastrophic pressure on water, sanitation, health services, etc. Aspirations for social mobility and search for better opportunities have already turned Pakistan into the second-most rapidly urbanizing country of South Asia with city dwellers

3 Idem

4 According to government priorities – see section D and section H, adverse flood and drought impacts should be especially addressed in 1) flood plains and drainage areas in highly populated areas (i.e. in urban areas) and / or where livelihoods and assets are most affected, 2) areas where people have difficulty to protect themselves and recover from floods and where access to clean water is limited, especially when water is contaminated due to floods - thus mostly in poor and informal settlements.

5 Pakistan's intended nationally determined contribution (PAK-INDC), p4

6https://www.washingtonpost.com/world/asia_pacific/a-disaster-in-the-making-pakistans-population-has-more-than-doubled-in-20-years/2017/09/08/4f434c58-926b-11e7-8482-8dc9a7af29f9_story.html?noredirect=on&utm_term=.d316ea032af7

accounting for 36 percent of the total population. In coming years this trend is set to continue.[7]

Pakistan's Human Development Index (HDI) value for 2018 is 0.550, which is in the low human development category - positioning the country at 147 out of 188 countries and territories.[8]The Economic Survey 2018 revealed[9] Pakistan's percentage of people living below the poverty line has fallen to 24.3 percent in 2015-16, with 6.1 percent of the Population living below income poverty line, PPP $1.90 a day (%) and 37.1 of the population Working poor at PPP $3.10 a day (% of total employment).

Figure 2: Incidence of poverty by district

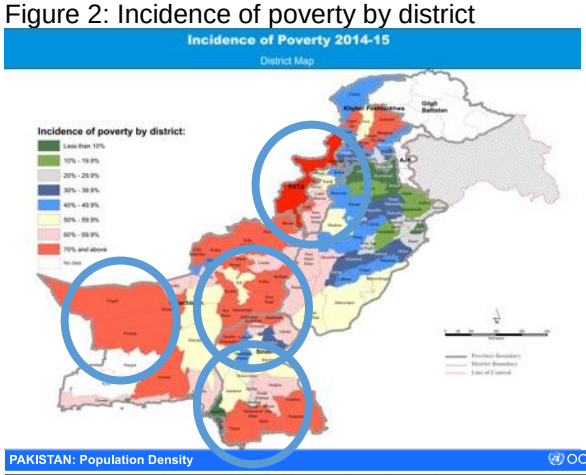
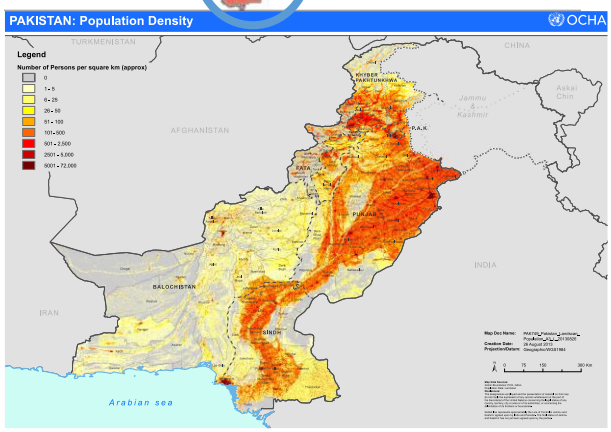


Figure 3: Population density



Geographic and demographic context and climate change: In light of the climate change projections, expected impacts and vulnerabilities (as discussed below), the high percentage of poverty combined with the rapid urbanization trend will lead to more people living is urban areas being at risk of climate change impacts. The reason is that most of the 'newcomers' are poor and therefore often have no choice but to reside in unplanned, informal and unsafe areas, such as close to rivers, drainage channels and on steep slopes.

Economic context

At an average economic growth rate of 4.9 percent from 1952 to 2015, current (2016) gross domestic product (GDP) of Pakistan stands at nearly US$ 278 billion.[10] This classifies Pakistan

7 Pakistan's intended nationally determined contribution (PAK-INDC), p7
8http://hdr.undp.org/en/countries/profiles/PAK
[9]https://profit.pakistantoday.com.pk/2018/04/26/pakistans-percentage-of-people-living-below-poverty-line-falls-to-24-3-percent-economic-survey-2018/
[10]https://data.worldbank.org/country/pakistan

as a lower middle-income country. With reference to current economic output categories, 58.8 percent is accounted for by services (mainly energy, gas and petroleum), 20.9 percent by agriculture and 20.3 percent by industry (of which 65.4 percent is contributed by manufacturing, 14.4 percent by mining and 12 percent by construction). Investments in power generation, energy distribution and 'China-Pakistan Economic Corridor' (CPEC) are expected to provide significant boost to the economy. Several large-scale infrastructure investments, energy and industrial growth projects currently in the pipeline, are expected to further accelerate the targeted economic growth.[11]

Economic context and climate change: In light of the climate change projections, expected impacts and vulnerabilities (as discussed below), public funds are being drained from essential social requirements towards disaster management. For instance, extreme climate events between 1994 and 2013 have resulted in an average annual economic loss of almost US$ 4 billion.Even though funds are moved to disaster management, the government lacks the financial and technical capacity to protect high density areas and especially informal settlements and rural areas and related services and infrastructure, as shown by the devastating impacts of the floods between 2010-2014, which resulted in monetary losses of over US$ 18 billion.

Social context

Pakistan's new poverty index reveals that four out of ten Pakistanis live in multidimensional poverty. The average intensity of deprivation, which is 50.9 percent, shows that each poor person, on average, is deprived in almost half the indicators considered for MPI calculation. However, as can be seen in figure 2 there are blatant differences in poverty incidences throughout Pakistan, where the regions like former Federally Administered Tribal Areas (FATA) and provinces of Balochistan and Sindh are especially poor, with the last two areas also known for high population densities along the country's main rivers (see figure 3). However, even in the relatively richer areas, poverty incidences in informal communities in urban areas are often very high.

The Pakistan Vision 2025, which makes a commitment to make economic growth inclusive and sustainable in order to eliminate poverty, needs measures to achieve its goals, which are also linked to SDGs. To eradicating extreme poverty and hunger, interventions need to focus on the poorest groups; to promote gender equality and empower women, women's traditional livelihoods and tasks (e.g. collection of drinking water) are threatened by climate change as they depend to a very large extent on climate sensitive resources (e.g. water). Regarding reduced child mortality and improved maternal health, more efforts are desired in service and infrastructure delivery, especially in emerging towns, where rural migrants settle, often informally and without access to basic services; regarding combatting HIV/AIDS, malaria and other diseases, outbreaks of dengue and other diseases in the country threaten progress being made. With 60 percent of the population being younger than 30[12], development efforts should focus on this group.

Social context and climate change: As mentioned in Pakistan's INDC: 'The livelihoods of the poor and the underprivileged segments of society are particularly at risk from the ever increasing exposure to natural calamities, such as flash floods, riverine overflows, heavy monsoons, cyclones, droughts and heat waves.'[13] Although, according to Vision2025, the government plans to expand and improve basic services and infrastructure in the country, it lacks the financial resources and technical capacity to do this in towns and villages, especially in

[11]Pakistan's intended nationally determined contribution (PAK-INDC), p7
[12] Pakistan National Human Development Report, 2018; UNDP Pakistan
[13]Pakistan's intended nationally determined contribution (PAK-INDC), p5

informal areas and in a climate sensitive way. In particular, the impacts of floods on basic services, including water contamination, need to be addressed in order for poor communities to escape poverty and reduce disease related mortality, malnutrition, stunting and associated health care and productivity loss related costs.

Environmental context

Pakistan is a large, geographically diverse country, with a number of significant ecological features, including extensive mountains, deserts, riverine, wetlands and coastal ecosystems, supporting distinct, diverse biological communities. Its forest cover is very low (only 4 percent). It has a vast glacial area, which covers about 15,000 square km comprising 5,000 glaciers, which are in rapid retreat. The rate of this retreat has gone up by 23 percent in the previous decade. Protecting the country's environment is necessary because:

- ☐ Pakistan loses almost 6 percent of GDP per annum due to environmental degradation;
- ☐ More than half of the population depends on the use of natural resources for its livelihood;
- ☐ Pakistan is a signatory to several Multilateral Environmental Agreements (MEAs), such as the Montreal Protocol on Substances that Deplete the Ozone Layer; the United Nations Framework Convention on Climate Change; the United Nations Convention on Biological Diversity; United Nations Convention to Combat Desertification; Kyoto Protocol; and the Stockholm Convention on Persistent Organic Pollutants.

Environmental context and climate: deforestation remains a challenge, especially with its rapid urbanization, which increases the demand for wood, and also because of the increased risks of flooding. The same accounts for coastal ecosystems. Climate change will exacerbate this and also other extreme weather risks.

Climate change: observation, projections, impacts and vulnerabilities

Pakistan is among the most severely threatened countries in terms of climate-induced challenges. Individual areas face unique stresses, which can be quite different depending on the geographical location and rate of urbanization of the individual administrative units within Pakistan. This requires a multifaceted approach to climate change at the national level, as well as active engagement with sub-national representatives.

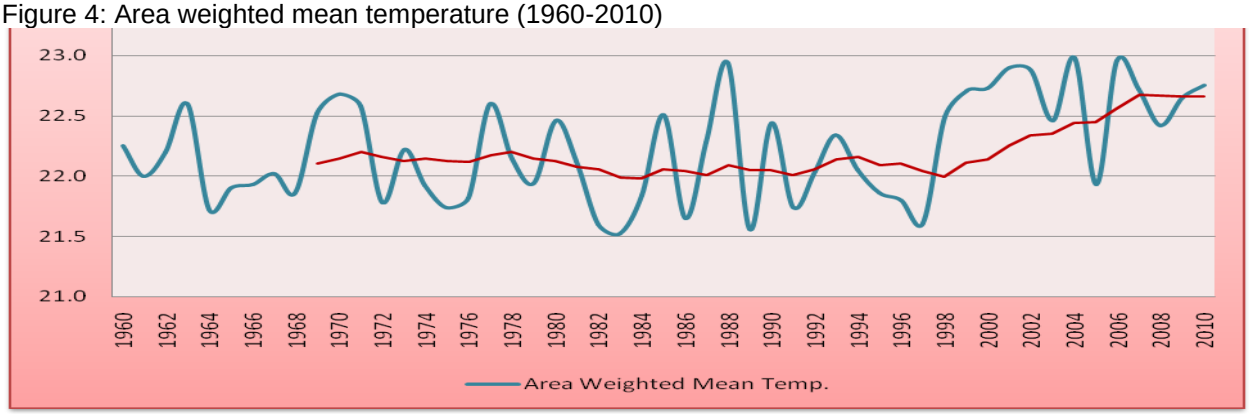
For Pakistan, adaptation to the adverse impacts of climate change is inevitable and likely to become critical in future. Due to geo-physical conditions, climatic extremes and high degrees of exposure and vulnerability, Pakistan has become a disaster-prone country. Frequent exposure to extreme climate-induced events such as droughts, floods, landslides, cyclonic activities, recession of glaciers, glacial lake outburst flooding (GLOF) and heat-waves have led the country to rank amongst top ten most climate-affected countries on the Global Climate Risk Index.[14]

Observational facts and trends
'In the last 50 years, the annual mean temperature in Pakistan has increased by roughly 0.5°C. The number of heat wave days per year has increased nearly fivefold in the last 30 years.

[14] https://germanwatch.org/en/download/20432.pdf

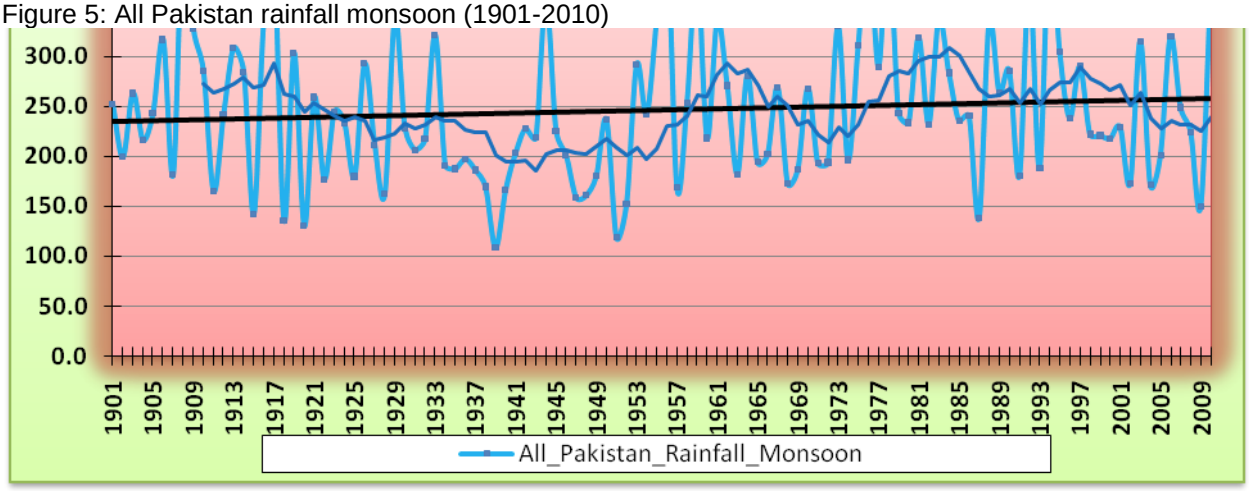
Annual precipitation has historically shown high variability but has slightly increased in the last 50 years. Sea level along the Karachi coast has risen approximately 10 centimetres in the last century.'[15]

Figure 4: Area weighted mean temperature (1960-2010)



Source: Government of Pakistan (2013, p3) Framework for implementation of climate change policy

Figure 5: All Pakistan rainfall monsoon (1901-2010)



Source: Government of Pakistan (2013, p4) Framework for implementation of climate change policy

[15] ADB (2017, p ix) Climate change profile of Pakistan.

Projections

'By the end of this century, the annual mean temperature in Pakistan is expected to rise by 3°C to 5°C for a central global emissions scenario, while higher global emissions may yield a rise of 4°C to 6°C. Average annual rainfall is not expected to have a significant long-term trend but is expected to exhibit large inter-annual variability. Sea level is expected to rise by a further 60 centimetres by the end of the century and will most likely affect the low-lying coastal areas south of Karachi toward Keti Bander and the Indus River delta.'[16]

Table 1: All Pakistan Climate Projections (2011- 2050)

Pakistan	Precipitation (mm/Decade)			Temperature (°C / Decade)		
	A2	A1B	B1	A2	A1B	B1
	+1.73	+1.26	-0.89	+0.51	+0.41	+0.24

Source: IPCC Special Report Emission Scenarios (SRES) and GCISC & PMD and joint report on climate change 2007

Table 2: Regional Climate Projections (2011- 2050)

Region	Precipitation (mm/Decade)			Temperature (°C / Decade)		
	A2	A1B	B1	A2	A1B	B1
Northern areas	+4.6	+2.9	-1.3	+0.76	+0.63	+0.39
Potohar & Upper KPK	+6.1	+3.8	-0.5	+0.01	-0.34	-0.01
Central / Southern Punjab & Lower KPK	-2.98	-1.78	-3.5	+0.63	+0.71	+0.05
High Balochistan	+1.48	+0.92	-0.57	+0.15	+0.26	+0.03
South-Eastern Sindh	+5.1	+3.0	-0.1	0.00	-0.1	+0.01
Sindh & Lower Balochistan	-1.8	-0.98	+0.5	+0.5	+0.27	+0.01

Source: IPCC Special Report Emission Scenarios (SRES) and GCISC & PMD and joint report on climate change 2007

It can be seen in the above table that most regions in Pakistan are showing a positive trend in temperature for the period mentioned. Maximum rise is expected in Northern Areas of the country and Central-Southern Punjab and Lower KPK. However, there are mixed trends of increase and decrease of precipitation in different regions.[17]

Impacts

'Under future climate change scenarios, Pakistan is expected to experience increased variability of river flows due to increased variability of precipitation and the melting of glaciers. Demand for irrigation water may increase due to higher evaporation rates. Yields of wheat and basmati rice are expected to decline and may drive production northward, subject to water availability. Water availability for hydropower generation may decline. Hotter temperatures are likely to increase energy demand due to increased air conditioning requirements. Warmer air and water temperatures may decrease the efficiency of nuclear and thermal power plant generation. Mortality due to extreme heat waves may increase. Urban drainage systems may be further stressed by high rainfall and flash floods. Sea level rise and storm surges may adversely affect coastal infrastructure and livelihoods.'[18]

[16] Idem

[17] Government of Pakistan (2013, p5) Framework for implementation of climate change policy

[18] ADB (2017, p ix) Climate change profile of Pakistan.

Table 3: IPCC Projected Climate Change Impacts for Pakistan

Impacts (IPCC Group II Summary for Policy Makers)	Likelihood (based on SRES) Scenarios	Project Sectoral Vulnerabilities to Climate Change in Pakistan
Over most land areas, fewer cold days / nights, warmer and more frequent hot days / nights.	Virtually Certain	**Water:** Increased water demand due to frequent heat waves; widespread stress on water availability during drought; higher temperature may adversely affect HKH glaciers reserves, which are the main source of water supply in Indus river system (IRS); increased salt water intrusion in Indus delta. **Agriculture:** Warmer temperatures in some areas may result in higher yields, but higher evapotranspiration and water deficit may affect crop yield in other areas. Warmer environment would increase the incidence of pest and disease. Increased extreme weather events would cause crop losses and land erosion in floods and reduced crop yields in droughts. **Energy:** Increased energy demand because of higher temperatures. Decreased hydropower potential due to reduced water availability in long term. **Human Health:** Increased risk of vector-borne disease (e.g. malaria, dengue) and heat related mortality due to warmer temperatures. Increased risk of deaths and injuries from extreme weather events and diarrheal outbreak due to reduced access to clean drinking water. **Ecosystem:** Increased risk of extinction of many species due to the synergistic effects of climate change and habitat fragmentation: Increased threat to the stability of wetlands, mangroves and coral reefs.
Warm spells/ heat waves, frequency increase over most areas.	Very likely	
Heavy precipitation events, frequency increased over most areas.	Very likely	
Areas affected by drought increase.	Likely	
Increased incidence of extreme high sea level.	Likely	

<u>Specific water availability concerns and vulnerabilities</u>

'With rapidly growing population, Pakistan is heading towards a situation of water shortage and by corollary, a threat of food insecurity. Per capita surface water availability has declined from 5,260 cubic meters per year in 1951 to around 1,000 cubic meters in 2016. This quantity is likely to further drop to about 860 cubic meters by 2025 marking Pakistan's' transition from a "water stressed" to a "water scarce" country (The minimum water requirement to avoid food and health implications of water scarcity is 1,000 cubic meters per capita per year).'[19]

Some specific issues concerning the water sector are:[20]

- ☐ The geographic location of Pakistan places the country in the heat surplus zone on Earth, putting it high on the vulnerability scale of climate change with considerable

[19] National water policy (2018, p 1)
[20] National water policy (2018, p 3-4)

increase in frequency and intensity of extreme weather events and erratic monsoon rains (as demonstrated by the unprecedented floods of 2010);

- ☐ Fresh water being a finite resource is progressively becoming scarcer due to persistent increases in its competing demands;
- ☐ Water scarcity can adversely affect the health and well-being of the people of Pakistan and must be resolutely addressed especially since it has serious implications for the nation's food and energy security;
- ☐ Different regions in the country are endowed differently with water in terms of precipitation, surface flow and ground water and there is increased stress on the sharing of water resources;
- ☐ Bulk of drinking water requirement is met by groundwater which is depleting, and its quality is deteriorating;

Some specific issues concerning flooding:[21]

'In 2010, Pakistan was hit by one of the worst natural disasters - floodwaters inundated 38,600 km^2 area in all four provinces and affected an estimated 20 million people, mostly by destruction of property, infrastructure and lands of livelihood, with a death toll close to 2,000. The resulting damages of about $10 billion were unprecedented in scale and magnitude-they were nearly half the cumulative total damages in the last 60 years.

Figure 6: combined flood and drought hazard risk map

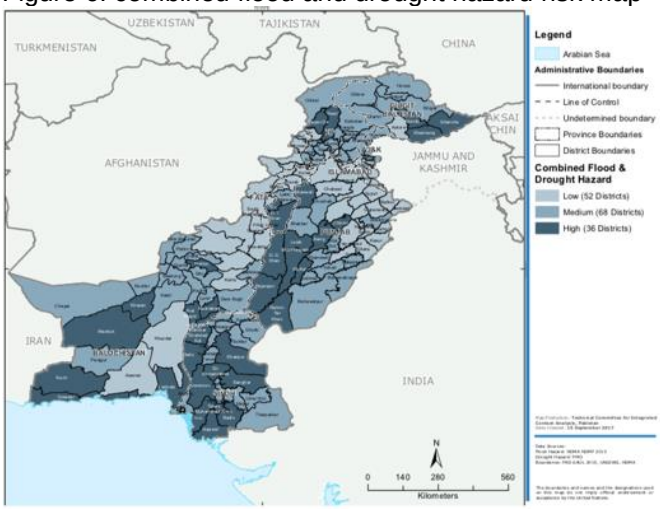


Figure 7: rivers of Pakistan

Source: NDMS (2017) Integrated Context Analysis (ICA) on Vulnerability to Food Insecurity and Natural Hazards

The extent of damages is all the more intriguing as total flooded area during was less than the floods of 1956, 1973, 1976 and 1992. The reason[22] is the growth of villages and settlements in the floodplains, almost twofold in 15 year period, along with development of roads and other infrastructure at increased cost, caused the flood damages to rise to this level and brought home the point that in order to reduce flood damages, the activity in the floodplains must be regulated.

[21] National flood protection plan (2016)
[22] National flood protection plan (2016, p 3)

Above climate change threats are exacerbated by the rapid expansion of urban areas. In order to meet the growing demands of the urban areas, agriculture patterns will change, deforestation will rise, fuel consumption will go up, and groundwater levels will go down, among many other issues. In turn, due to deforestation, erosion and construction in or close to flood plains and drainage channels, the intensity of floods affecting urban areas will increase even more.

The brunt of droughts and floods mostly falls on the poorest people of the country who reside in smaller and informal settlements where the infrastructure and construction are of poor quality. According to the National Disaster Management Authority (NDMA) and UN-Habitat[23], it became evident that communities are vulnerable to various hazards due a number of reasons: geographically, areas along riverbanks or drainage channels are at high risk of flooding. Furthermore, mountainous regions, especially areas below the mountain slopes are prone to landslides. The infrastructural quality is weak and shelters in the region are not disaster resilient and hence cannot withstand floods, winds, and landslides, causing massive destruction. This destruction further aggravates the conditions as services are hampered, water, sanitation, and hygiene (WASH) services become ineffective, resulting in spread of diseases and the already affected households do not have the capacity to cope with the massive losses. In areas of drought, longer dry spells make household vulnerable as access to water is minimum, resulting in domestic and agricultural problems.

In order to enable the population of Pakistan to become climate change and disaster resilient and improve their adaptive capacity, especially of those living in urban disaster-prone areas, it is necessary to identify the characteristics of a “climate-fit” community in the context of Pakistan, and how to improve the resilience of the population considered to be “climate-weak”. Geography plays a major role as disaster-prone areas are more challenging and usually have higher endemic disease rates. However, increased population pressures force people to live in more disaster-prone areas such as along riverbanks, drainage channels, low-lying areas and below mountain slopes. The type, weaknesses, and strong points of a community and their service requirements, especially of women, children, elderly and disabled people, are the main elements to develop disaster resilience plans targeted at that specific community.

Table 4: Historical Flood Damages in Pakistan, 1950-2014

[23]NDMA (2017) Integrated Context Analysis (ICA) on Vulnerability to Food Insecurity and Natural Hazards and UN-Habitat Multi-Hazard and Vulnerability Risk Assessments (MHVRAs) conducted by UN-Habitat in Chitral

Year	Direct Losses (US$ million) 1US$=86PKRs	Lost Lives (number)	Affected Villages (number)	Flooded Area (km^2)
1950	488	2,190	10,000	17,920
1955	378	679	6,945	20,480
1956	319	160	11,609	74,406
1957	301	83	4,498	16,003
1959	234	88	3,902	10,424
1973	5,134	474	9,719	41,472
1975	684	126	8,628	34,931
1976	3,845	425	18,390	81,920
1977	338	848	2,185	4,657
1978	2,227	393	9,199	30,597
1981	299	82	2,071	4,191
1983	135	39	643	1,882
1984	75	42	251	1,093
1988	858	508	100	6,144
1992	3,010	1,008	13,208	38,758
1994	843	431	1,622	5,568
1995	376	591	6,852	16,686
2010	10,000 (@1US$=86 PKR)	1,985	17,553	38,600[a]
2011	3,730 (@1US$=94 PKR)	516	38,700	27,581
2012	2,640 (@1US$=95 PKR)	571	14,159	4,746
2013	2,000 (@1US$=98 PKR)	333	8,297	4,483
2014	500 (@1US$=100.9 PKR)	367	4065	9779
2015	170	238	4,634	2,877
Total	38,053	11,939	192,596	613,721

Source: 2015-Annual Flood Report of Federal Flood Commission, Islamabad.

In summary, climate Change is taking its toll on Pakistan as has been evidenced by an increase in the intensity and frequency of climate induced disaster events in Pakistan. There is an increasing recognition among policy and decision makers of this fact and addressing climate change related flood- and water droughts / water scarcity issues have become government top-priorities. While Pakistan is urbanizing at a fast pace, the battle against climate change adversities will have to be fought in urban areas. With a change in precipitation and temperature patterns, floods and droughts are becoming more intense. The proposed interventions aim to address this situation by putting in place solutions that could reduce the risk and impacts of flooding in urban areas while offering sustainable options for increasing the access of communities to safe drinking water especially in the face of increasing droughts / water scarcity.

Target areas and population

Target communities in Nowshera and Rawalpindi are characterized by a high exposure to floods and droughts / water scarcity (see also annex 3). Climate sensitivity in the city is underpinned by rapid urbanization and population growth, leading to people residing in high-risk flood areas. Underlying vulnerabilities are extreme poverty, informality and limited access to basic services, especially clean water (often due to water contamination caused by floods), gender inequalities and environmental degradation. Moreover, the adaptive capacities at household, community and governance level are barriers for change.

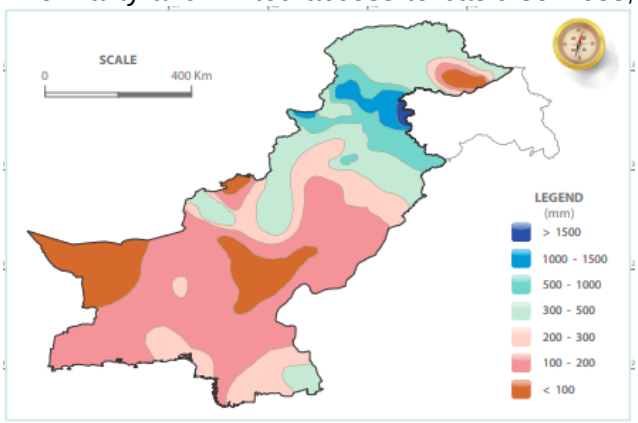


Figure 8: Rainfall in Pakistan

The selection of Nowshera and Rawalpindi cities and target communities is based on a combination of above criteria (especially

flood and drought risks), government preferences, geographic locations that allow for upstream, higher elevation (versus flat surface) water harvesting and rooftop rainwater harvesting options. Climate change impacts and vulnerabilities have been identified through national studies focused on target areas, NGO studies and questions used during consultations with target municipalities and especially target communities (see summary of outcomes in tables 6 and 7).

The link between climate change related floods and water quality and scarcity issues.
As shown above and in annex 1 and 3 in detail, the target cities are heavily and increasingly affected by floods. Floods, in turn, affect water availability and quality because boreholes (on which the poorest household depend) get flooded by flood water that is polluted by waste in drainage channels. This contaminates the groundwater, which becomes undrinkable, leading to water scarcity, even in the wet season. At the same time, droughts are increasing in the dry season and fresh water from glaciers reduce due to climate change.

Upstream water harvesting system both reduce vulnerabilities to floods and droughts / water scarcity issues at the community level (through grey water availability, e.g. for irrigation and toilets). To reduce vulnerabilities related to water scarcity and water borne diseases at the household level, rainwater harvesting and cleaning systems will be installed at households above flood water levels, allowing households to access clean water directly.

Rawalpindi city

Climate change risks, impacts and vulnerabilities

Climate change-related urban flooding and prevailing drought are major concerns in Rawalpindi. The city is vulnerable to flooding during monsoon season. The intensity and frequency of flooding is increasing over the past years. According to Pakistan District level climate risk and hazard assessment, flood risk is high in Rawalpindi district and drought risk is medium. The consultations held in target communities confirmed the same main issues.

Specific flood risks, impacts and vulnerabilities

Rawalpindi city is located in the downstream catchment basin of Lai Nallah (with hills and mountains in the north), which used to be a fresh water stream a few decades ago. It is now the main channel carrying the sewage and storm water of Islamabad and Rawalpindi. Lai Nallah is fed by a number of channels that serve as the main sources of drainage for the twin cities.

Figure 9: Lai Nallah in Rawalpindi

In Rawalpindi city, the Lai Nallah bisects the city dividing it into areas administered by Rawalpindi Municipal Corporation and those administered by Cantonment Administration. Over the years, in absence of any land use regulations and control, both banks of Lai Nallah have been populated and now some of Rawalpindi mostly densely populated residential and

important commercial centres are located here and hence are vulnerable to recurrent flooding in Lai. It is recommended by the national government that a permanent solution of the problem must be evolved as early as possible.[24]

A total of 19 flood events occurred during the last 59 years, among which the flood of July 2001 was the largest. On 23 July 2001, a cloudburst resulted in 620 mm of rainfall recorded in 12 hours in Islamabad. Heavy floods in Nullah Lai—a rain-fed natural stream flowing through the Rawalpindi City—and its tributaries inundated the nearby houses, bridges, and roads. This urban catastrophe resulted in losses to life and property, with a death toll of 61 people, destruction of 800 houses, and damage to 1,069 houses. This is largely because of the encroachment on the banks of the Nullah, against which no action is taken by the concerned authorities.

Rawalpindi's population density around the Nullah Lai is about 4,200 persons per km2 (2012). Due to land scarcity, people have even constructed their houses in the bed of Nullah Lai. Floods start when water levels of the Nullah Lai exceed 5.5 meters, which is usually during the monsoon season (July to September). The Tehsil Municipal Administration blows a siren in low-lying areas when the water level reaches the alert level of 4.8 meters. Those most affected by flooding in Rawalpindi live in slums and low-lying areas. Annually, some 400,000 people are affected by floods in the city.

Specific drought and water scarcity risks, impacts and vulnerabilities[25]

Over the years Rawalpindi has turned into a water scarce city. Currently there are three main water supply sources, Rawalpindi city depends upon. These include Rawal Lake located in Islamabad Capital Territory (ICT), Khanpur Dam located in neighboring Khyber Pakhtunkhwa province and more than 200 operative tube wells. The approximate supply of water from these three sources is 43 mgd. In 1990 the total yield from Rawal Lake was around 42 mgd, which is estimated to decline to 30.85 mgd in 2020 largely due to siltation if the water inflow remains the same. This trend translates into more dependence on ground water sources, which are already depleting fast. The excessive exploitation of ground water sources through ever increasing number of tube wells is pressing hard the water table. The unavailability of municipal piped water supply; in numerous new housing schemes and in areas of Rawalpindi, where municipal piped water supply is not sufficient; leaves households with no other option but to make their own arrangement mostly in the shape of installation of domestic pumps for extraction of ground water or to get water from other neighbourhoods. The heavy reliance on ground water resources is causing water table to fall alarmingly. For instance, in 1980 the average water table in Rawalpindi was 40 ft which has gone down since to 150 ft or even more in some cases, making further extraction uneconomical. If the existing trends continue the ground water sources will be depleted further at much faster pace. In total, 80 percent of the groundwater boring and wells in Rawalpindi have become dry and is assessed to be unfit for drinking. Moreover, the water resource vulnerability evaluation index proved that the water resources in Rawalpindi found to be relatively vulnerable according to the vulnerability standards. Rapid increase in population, reduction in water table due to excessive withdrawal, change in rainfall

[24] Pakistan government (2016, p 67) National flood protection plan

[25] Excerpted from Sindhu, A.S.; Rawalpindi-Islamabad: Multi Hazard Risk Mapping; Plan International Inc. Pakistan; 2014

pattern and poor socioeconomic condition have greatly contributed to the relative vulnerability to climate change in Rawalpindi[26].

Population

As per the preliminary results of National Housing and Population Census 2017, Rawalpindi district has a total population of 5,405,633 distributed in 888,765 households. Of this population 2,875,516 or 53 percent resides in urban settlements of the district. Of the total urban population 2,098,231 is concentrated in Rawalpindi city alone. The annual growth rate is 2.75 percent. The average household size is around 5,8 persons per household. The religious distribution is that 96.8 percent are Muslim, 2.47 percent Christian and 0.73 percent belong to other religious groups. The main industries of the city include oil refineries, gas processing, steel manufacturing, iron mills, railroad yards, textiles, leather goods production, etc. Because of these industries, it is regarded as one of the most polluted cities in the world.

Target communities and population

For the implementation of the AF project, the following communities in Rawalpindi city are proposed to be targeted:

Table 5: target communities in Rawalpindi and estimated population

Union Council (UC) No.	UC Name (area)	Estimated Population as on 31 Dec 2016*	Estimation by UC representative 2018
UC # 1	Ratta Amral	29,149	
UC # 2	Dhoke Ratta	28,883	
UC # 4	Dhoke Mangtal	33,390	43,000
UC # 5	Dhoke Hassu North	20,544	38,700
UC # 6	Dhoke Hassu South	19,980	34,000
UC # 12	Dhok Najju	28,152	40,000
UC # 37	Dhoke Dalal	24,310	
Total		184,408	155,000

*Source: Punjab Development Statistics, 2016; Punjab Planning and Development Department

Community consultations and women focus group discussions took place in the most flood and water scarcity affected communities: UC 4, 5 and 6. Within these communities the most vulnerable and poorer households, and especially women and youth, will be targeted for household-level water harvesting activities.

Overview UC 4, 5 and 6

Poor 60 % (depend upon daily wage labour)
Average Household size: 7
Access to electricity: 100%
Access to clean water: Contamination is a widespread issue.
Types of Water Supply:

- Tap water: 65-70%
- Hand pumps: 2%

[26] Shabbir, Rabia, and Sheikh Saeed Ahmad. "Water resource vulnerability assessment in Rawalpindi and Islamabad, Pakistan using analytic hierarchy process (AHP)." *Journal of King Saud University-Science* 28.4 (2016): 293-299.

	• Boreholes: 25% • Wells: 1-2% • Water vendors: 5%
Access to sanitation	100% (poor though)
WASH	Many areas do not have an underground sewerage system and instead depend upon open sewers in the streets.

Target communities and their populations, of which youth and children are highly represented, are mostly affected by interrelated water scarcity, water borne diseases and floods. Floods can be as high as 4 meters above the ground, affecting houses, but also enter boreholes, wells, hand pump, contaminating groundwater. Women and children are especially hit hard by floods, diseases and water scarcity (see above). Poverty is rampant. Men resort to daily wage labor while women contribute in household incomes by working as domestic servants or undertaking works like sewing/tailoring in their homes. Although flood reduction is a priority need, community members fear that government flood protection measures will lead to the removal of encroachments from Lai Nallah's banks and thus to their displacement. The community has a strong sense of togetherness. Women mentioned that they and their households would be ready to contribute their labor in any community led interventions. Many people know construction skills as men work as masons and construction labor. These skills can be harnessed for community based/community led initiatives involving simple construction skills. Overall, the community has a strong urge to improve their living conditions. This urge can be harnessed to mobilize the community for community-based initiatives.

The project will focus on communities/areas and households that are affected by flood, water scarcity and related diseases, especially those dependent on groundwater / boreholes that are polluted. Women and youth will be promoted as agents of change, while specific needs especially of children, but also other vulnerable groups, will be considered.

Figure 10: Target communities and flood risks in Rawalpindi

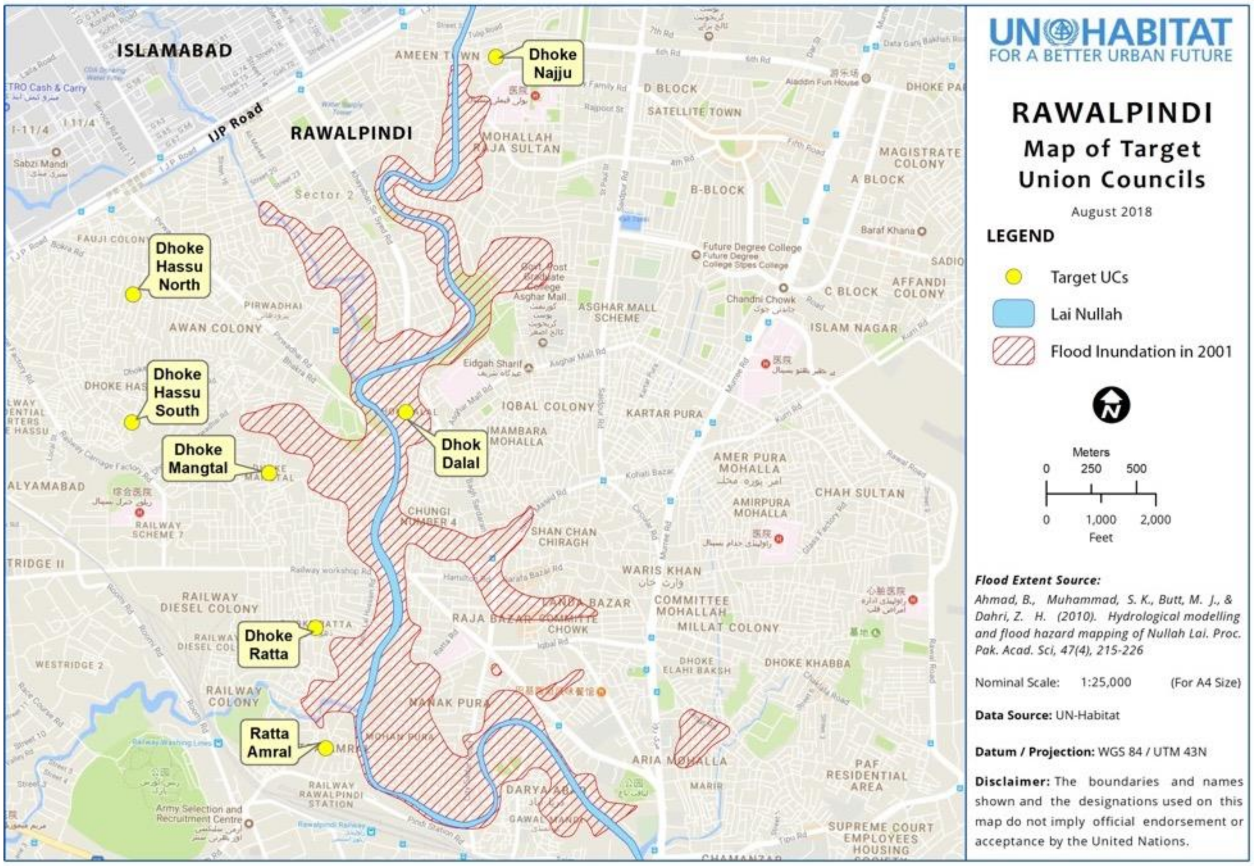

UN-HABITAT
FOR A BETTER URBAN FUTURE
RAWALPINDI
Map of Target Union Councils
August 2018
LEGEND
Target UCs
Lai Nullah
Flood Inundation in 2001
Meters
0 250 500
0 1,000 2,000
Feet
Flood Extent Source:
Ahmad, B., Muhammad, S. K., Butt, M. J., & Dahri, Z. H. (2010). Hydrological modelling and flood hazard mapping of Nullah Lai. Proc. Pak. Acad. Sci, 47(4), 215-226
Nominal Scale: 1:25,000 (For A4 Size)
Data Source: UN-Habitat
Datum / Projection: WGS 84 / UTM 43N
Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
ISLAMABAD
RAWALPINDI
IJP Road
Dhoke Najju
Dhoke Hassu North
Dhoke Hassu South
Dhoke Mangtal
Dhok Dalal
Dhoke Ratta
Ratta Amral

Table 6: target communities and population, main climate change hazards and effects, barriers to adapt and possible resilience building interventions (based on consultations (see Part II.H and annex 1)

Community	Population / beneficiaries (Disaggregated)	Main climate change hazards and impacts	Effects on community / underlying vulnerabilities	barriers to adapt	Possible resilience building interventions identified (and which may be feasible)
Dhoke Mangtal (UC 4) Dhoke Hassu North (UC 5) Dhoke Hassu South (UC 6) Dehook Najju (UC 12)	43,000 (2018 estimation) 38,700 34,000 40,000 Total: 155,700 - Female: 47% - < age14: 37% - age 15-24: 21% - age 25-60: 39 % - > age 60: 3% - Disabled: 2% - Some Afghan refugee families	1. Water scarcity (caused by increased droughts and contaminated water due to increase of floods that contaminate ground water)	- The poor households are most affected as they cannot afford to bear the cost of installing a borehole and neither can pay for availing the facility from private water vendors. - Getting water for poor households which make up more than half of the community cost them considerable portion of their meager incomes - Collection of water largely rests with women and children. Sometimes they spend hours in this activity - Lack of water availability also compromise hygiene needs, which in turn affect health. - Scarcity of water is also a source of feuds among neighbors. Gender (women) specific: - Women have to travel almost two kilometers to bring drinking water from two nearby water sources--private boreholes (in Dhok Najju).	- Dependence on groundwater, which is polluted and for which water tables have dangerously gone down - For a borehole, households have to dig as deep as 300 feet and even more, which is costly - Absence of water sector planning at various levels. - Lack of awareness and technical support Gender (women) specific: - Women are not involved in any community-based decision making - The respondent women had little idea of water harvesting techniques and how they may affect their lives - Since they are poor they would not be able to invest in rainwater harvesting technology.	- Rainwater harvesting - Construction of new dams - Rehabilitation of existing tube wells
		2. Water borne diseases (caused by contaminated water due to increase of floods that	- Contaminated water is a source of number of water borne diseases including diarrhea, gastro and hepatitis to name a few. - The poor households are among the most affected as they prefer quantity over quality	- People do not have a control on quality of water being supplied through municipal authorities as well as water vendors. - General lack of awareness and absence of options	- Laying of water supply pipes in a manner that they are not close to sewerage system. - Installation of water filtration

		contaminate ground water)	Gender (women) specific: - The prevalence of water borne disease and epidemics especially affects younger children. Taking care of them primarily comes to women increasing their burden and affecting their productive time. Disability among children is especially high.	- Households who can afford have installed water filters while some also practice boiling of water before consumption for drinking purposes. Gender (women) specific: - Women are not involved in any community-based decision making	plants and their regular maintenance - Boiling/disinfection of water before consumption. - Awareness campaigns
		3. Flooding from Nallah Lai and other drains	- Absence of land use planning and control has also contributed in localized flooding. The natural drainage channels as well as Lai Nallah have been encroached leading to narrowing of their traditional right of ways. - In absence of an effective solid waste management system, waste ends up in local drains and Lai Nalla causing high levels of pollution. - Although floods affect all, they affect most to those households who are located just next to the Lai Nalla and other drains. - During rainy season the houses located next to Lai Nallah and other drains get affected almost annually. Gender (women) specific: - Women being responsible for housekeeping have to put a lot of effort and time in cleaning their houses whenever these are affected by floodwaters. - The monsoon season brings fear and especially women have to stay extra conscious spending sleepless	- Dense area and little options to move away from risk areas - Households located next to Nallah Lai and other drains largely keep their ground floors free of furniture and other hard to move objects especially during the flooding season. - At some places, people have constructed small embankments, walls to remain safe from flooding. However, this strategy rarely helps. Gender (women) specific: - Women are not involved in any community-based decision making	- Construction of new dams - Other proposed interventions are (partly) being done by the government)

			nights.		

Note: identified possible concrete interventions such as tube wells are suggestions from community members consulted but will not be developed because of one or several of the following reasons: 1) government is already developing projects, 2) not feasible and / or cost-effective, 3) possible negative environmental or social risks / impacts (e.g. tube wells will be flooded), 3). Thus, the project will focus on community level and household level water harvesting systems.

Figure 11: drainage channels closed-in by houses and filled with waste in target communities in Rawalpindi – flood levels reach four meters above the channel banks, which is the 2nd floor of houses.

Figure 11b: Flood and drought coping mechanisms – ground water gets polluted because boreholes (see pump) gets flooded. Water is collected from other neighbourhoods a few times a day.

Nowshera city

Climate change impacts and vulnerabilities

According to Pakistan District level climate risk and hazard assessment, Flood risk for Nowshera is very high and drought risk is medium. Heavy rains during monsoon cause flooding every year in Nowshera. As per the National Disaster Management Plan (NDMP) 2013-22, the district has a total risk weight of 24.12 in overall relative severity index of the country. The consultations held in target communities confirmed the same main issues.

Specific floods risks, impacts and vulnerabilities[27]

Nowshera city is located along the River Kabul and north of a small mountain range. Within a stretch of about 15 km, between M1 Kabul River Bridge and Nowshera, Kabul River is primarily a confluence area for 7 major river courses, which makes this region very vulnerable to flood hazards. In absence of any formal land use planning effort, the city has expanded uncontrolled. Many residential neighbourhoods, public buildings like schools, hospital and even government offices and commercial areas are located close to the river, so much so that the boundary walls of these structure now act as embankments for the river. There are a number of hill torrents locally called *Khawaar,* which drain into the River Kabul. Some of these pass through the city. Due to uncontrolled development of the city and its adjoining areas, building structures have been constructed in the ways of these torrents. This situation also results in localized flooding. City's waste water is directly drained into the river Kabul. Flash flooding is a common phenomenon in district Nowshera; due to the mountainous terrain in the southern parts of district and due to encroachment in the urban centre of Nowshera City, flash flooding is increasing. The urban Centre/ Nowshera City, Nowshera Cantt, Pabbi, Akora Khattak, Jahangira and rural area of Khesgi Payan, Kheshgi Bala, Akbar Pura, Pir Sabak, Nizampur,Kaka Sahab, Cherat, and surrounding areas are all prone to flash floods.

Figure 13: Rescue from floods in Nowshera

There have been various floods in the district. Some notable events are those of 1950, 1956,1957,1973,1976,1978,1988,1992. However, the highest flood the district suffered which was 15 Federal Flood Commissions Reports 17 in July 2010 which caused exceptional damages. An estimated loss was recorded as US $ 10 billion and US $ 3.7 billion respectively in 2010-11 floods in Nowshera. Ninety percent of the families were displaced in Nowshera during the floods in 201028. It caused drastic losses to infrastructure, government installations, properties, businesses, livestock and houses.

Specific drought and water scarcity risks, impacts and vulnerabilities

[27]For this section three main sources have been cited: District Disaster Risk Management Plan Nowshera developed by District Disaster Management Unit of Nowshera, 2014; Nowshera City Multi Hazard Risk Assessment, developed for UNISDR in 2011; and views of the local residents as recorded during discussions with them.

[2828] Reducing Vulnerability through Distster Risk Management in KP Pakistan, Project Funded by Royal Norwegian Embassy in Islamabad

Nowshera widely suffers from contamination of drinking water. The District Disaster Management Plan 2014 notes, "In District Nowshera water samples were collected from different sources such as tube wells, dug wells and hand pumps. Most parameters were found to be much higher than what are considered permissible levels by the WHO. More than 60 percent of the samples were found to be unfit for drinking. The results indicated water quality in Nowshera deteriorated due to the floods in 2010. The areas where water quality issues were severe included parts of Mohib Banda, Dheri Mian Ishaq, Tetaray, Khush Maqam, Jabba, Nowshera Kalan, Azakhel Payan, Bara Banda, Amankot, Hakeem Abad, and Dag Besood." This is problematic since the risk of droughts is increasing simultaneously: according to Pakistan District level climate risk and hazard assessment, the drought risk is medium for Nowshera.

Population

According to National Housing and Population Census 2017, Nowshera district has a total population of 1,518,540. The average household size is 7.6 persons. 197,673 people live in Nowshera City. The religious distribution is that Muslims comprise 99 percent; Christian 0.5 percent; Ahmadi 0.3 percent and Hindu 0.1 percent. The main clans are Khattak, Durranis, Kakakhels, Yousafzai, Afridi.[29] Economically speaking, 22 percent of the population relies on agriculture while majority of the people are in other profession or in government service.[30]Nowshera City is further divided into three larger portions: Nowshera Kalan (or area being administered by Nowshera Municipal Committee); Nowshera Cantonment and Risalpur Cantonment. Both cantonments are managed by their respective cantonment boards. Nowshera Kalan, or older part of Nowshera, has a total population of 83,567. This area is targeted for the project.

Overview Nowshera Kalan

Poor	50 % (depend upon daily wage labour)
Average Household size:	6.7
Access to electricity:	100%
Access to clean water:	Contamination is a widespread issue. Types of Water Supply: • Tap water: 27% • Hand pump: 22% • Motor pump: 47% • Dug well: 2% • Other: 2%
Access to sanitation	97% (poor though)

Target communities and their populations, of which youth and children are highly represented, are mostly affected by interrelated water scarcity, water borne diseases and floods. Floods mainly come from the river, but also from channels sourced from the mountains, affecting houses, but also enter dug wells, hand pump, and motor pumps, contaminating groundwater. Women and children are especially hit hard by floods, diseases and water scarcity (see above). Poverty is rampant. The male members of households in many households earn their living through menial labor in Nowshera and other places in Pakistan. Nowshera's construction workers are famous for their skills in plastering. The other livelihood sources include government jobs, jobs in small scale industry, shop keeping etc. Very few females are in paid employment. Mostly the educated women work as teachers in government schools.

[29] District Disaster risk management plan Nowshera 2014

[30]Idem

The project will focus on those communities/areas and households that are affected by flood, water scarcity and related diseases, especially those dependent on groundwater / boreholes that are polluted. Women and youth will be promoted as agents of change, while specific needs of especially children, but also other vulnerable groups, will be considered.

Figure 14: Target communities in Nowshera

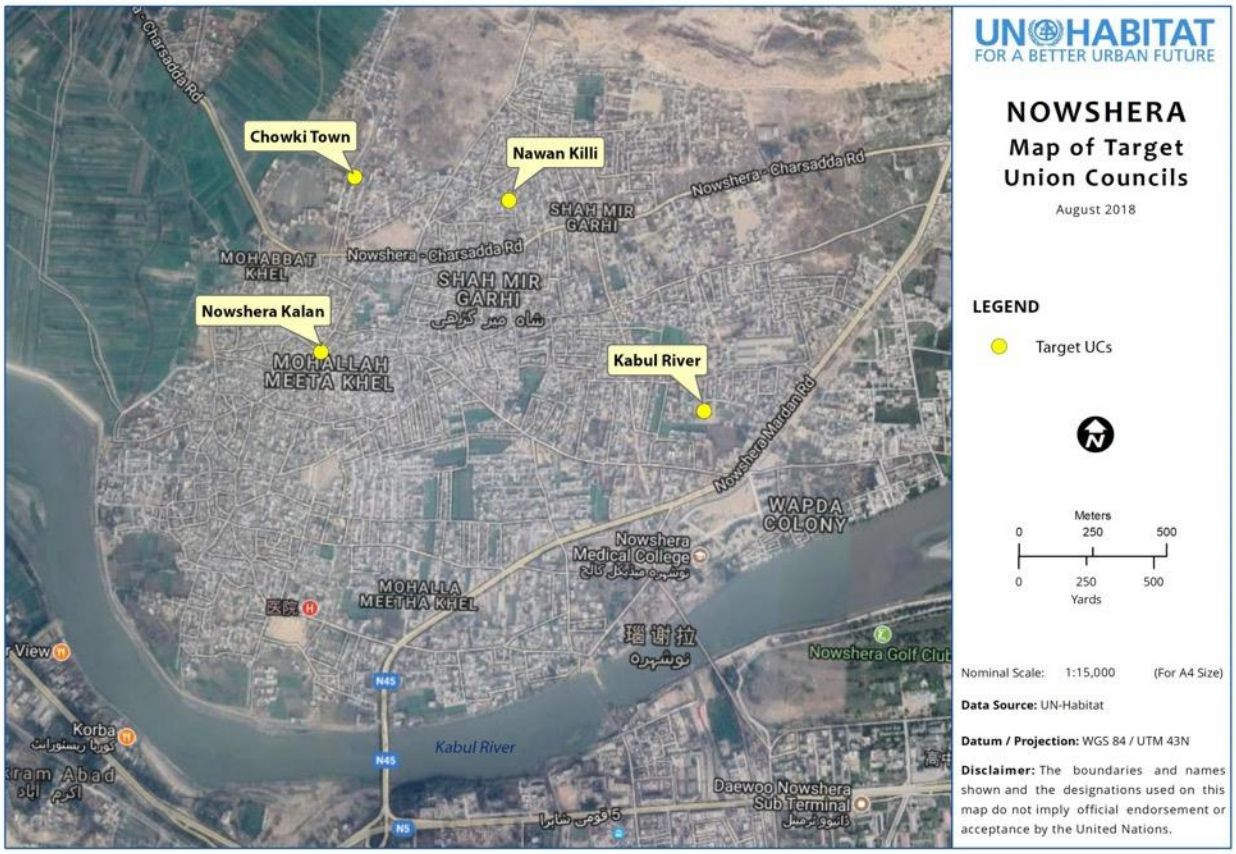


Table 7: target communities and population, main climate change hazards and effects, barriers to adapt and possible resilience building interventions (based on consultations (see Part II.H and annex 1).

Community	Population / beneficiaries (Disaggregated)	Main climate change hazards and impacts	Effects on community / underlying vulnerabilities	barriers to adapt	Possible resilience building interventions identified (and which may be feasible)
Nowshera Kalan	83,567 - Female: 48% - < age14: 38% - age 15-24: 20% - age 25-60: 40 % - > age 60: 2% - Disabled: 2% - Nowshera district had once sheltered a very large number of Afghan refugees. (As per UNHCR report March 2018, registered refugees are 36,675 in the district) In recent years it became one of the main areas where IDPs from trouble hit tribal areas and Swat took refuge. However, the exact population of this refugee population in Nowshera Kalan is not known.	1. Drought / scarcity of clean water (caused by increased droughts and contaminated water due to increase of floods that contaminate ground water)	- The available water from municipal supplies stinks and is highly contaminated. - The ground water up to the depth of 100 ft is not fit for human consumption. - The poor households not being able to afford water purification/filtration systems are compelled to consume contaminated water	- Citizens consider that supply of water is responsibility of government. - Especially poor and lower middle income households can't afford to install boreholes to extract groundwater from safer depths - Households generally are not aware of household level low cost water treatment technologies as is apparent from lack of availability of these technologies. - Water harvesting at community and household levels has never been considered as an option. Most of the respondents had not heard of them even.	- City's water distribution system should be overhauled. - Water filtration plants should be installed in every neighborhood and these plants should be regularly maintained.
		2. River flooding	- Over the years, the haphazard and unplanned growth of the city resulted in encroachment of river banks. Whenever river overflows the surrounding localities are inundated. - Besides River Kabul a number of natural water channels that drain into River Kabul also pass through the city. During rainy season, these channels also cause flooding inundating	- The communities are not familiar with community-based flood management measures. - Flood resilient building codes and practices and land use controls are not in place. - Like River Kabul, the natural water channels that pass through the city have also	- Construction of retaining walls and embankments. - Construction of check dams and water storage

			neighboring areas. - Settlements located in close proximity to River Kabul and water channels that drain into the river are among the most vulnerable areas. The poor households that make up the majority of these settlements are little prepared to reduce their vulnerability to recurrent flooding events.	been encroached. At certain locations, buildings have been erected even in the beds of water channels. When rainwater flows in these channels it causes damage to these structures. - The city has a poor drainage system - The river and the water channels have been turned into dumping points for city's solid waste. This situation chokes them and obstructs the free flow of flood waters.	ponds - Installation of an effective flood early warning system.
		3. Diseases/epidemics (caused by contaminated water due to increase of floods that contaminate ground water)	- There is high prevalence of diseases like dengue, gastro, diarrhea, choler and hepatitis. Local residents attribute them to poor sanitary conditions of the city. - The disease outbreak intensifies in flooding seasons. - Kabul River has been turned into a dumping site for solid waste of the city besides its being the disposal point for city's sewage. - People of all ages and all sexes are affected. However, it is the poor households and children who are most affected from water borne diseases - The burden of disease not only causes health problems but also causes economic losses by reducing the productive time available to poor families. - Poor households have to allocate a considerable portion of their meager incomes on healthcare. - Incidences of diarrhea are high among the infants and younger children	- The municipal authorities neither have financial resources nor have technical skills at their disposal to address city's chronic water contamination challenge. - Many households have installed hand pumps as main source of water supply. However, these too do not deliver clean drinking water - Concerned authorities have so far been unsuccessful in launching effective public health awareness campaigns and preventive measures to control outbreak of dengue, malaria and diarrhea.	- Concerned authorities should design an effective waste managemen t plan for liquid and solid waste to stop the contaminatio n of drinking water from them.

Note: identified possible concrete interventions such as retaining walls and embankment are suggestions from community members consulted but will not be developed because of one or several of the following reasons: 1) government is already developing projects, 2) not feasible and / or cost-effective, 3) possible negative environmental or social risks / impacts (e.g. tube wells will be flooded), 3). Thus, the project will focus on community level and household level water harvesting systems.

Figure 15: Flood impact in Nowshera. Source: Aug. 3, 2010 (U.N. photo by Amjad Jamal).

Figure 16: Man drinking water from a hand pump in Nowshera

Source:www.bostonglobe.com. A Majeed/AFP/Getty Images

2. Project Objectives

The main objective of the proposed project is to enhance community and local and national-level government capacities to address climate change-interrelated urban flood and drought / water scarcity issues. This will be achieved through the following proposed sub-objectives:

Community level:

1. Enhance community- and household-level flood resilient water harvesting facilities and strengthen capacities to plan, construct, operate, maintain and duplicate these.

District / City level:

2. Enhance city and district-level up-stream water harvesting facilities (that also reduce flood impacts down-stream) and strengthen government capacities to plan, construct, operate, maintain and duplicate these in areas suitable for tackling flood and drought issues at the same time.

National level:

3. Strengthen national-level capacity to guide / direct city-level development considering climate change and disaster risks and impacts, especially floods and droughts.

3. Project Components and financing

Table 8: project components and financing

Project Components	Expected Concrete Outputs	Expected Concrete Outcomes	Amount (US$)
Component 1 Community level activities: Enhance community- and household-level flood resilient water harvesting facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these.	Output 1.1. (concrete) 5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	Outcome 1.1. Increased adaptive capacity within the water sector at community level – 35,000 people benefitting directly from rainwater harvesting facilities (7 people per household) and around 200,000 indirectly In line with AF outcome 4	2 million
	Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate water harvesting facilities at community level, and to reduce waste in drainage channels through awareness raising campaigns	Outcome 1.2. Strengthened awareness and ownership of flood and water risks and impacts and how to address these at community level In line with AF outcome 3	800.000
	Total		2.8 million
Component 2 District / city level activities Enhance city and district-level up-stream water harvesting facilities (that also reduce flood impacts down-stream) and strengthen capacities to plan, construct, operate, maintain and duplicate these	Output 2.1. (concrete) 40 district / city-level water harvesting facilities (small reservoirs) constructed (or smaller number if bigger reservoirs are possible)	Outcome 2.1. Increased adaptive capacity within the water sector at district / city level – all inhabitants along downstream drainage channels benefit from the intervention In line with AF outcome 4	1.2 million
	Output 2.2. Two district / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans. These strategies are decision-making tools for cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors	Outcome 2.2. Strengthened urban level government capacity to reduce climate change related flood and drought risks, also beyond city boundaries In line with AF outcome 2	200,000

	Output 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans		100.000
	Total		1,5 million
Component 3 National level activities: Strengthen national-level capacity to guide / direct city-level development considering climate change and disaster risks and impacts, especially floods and droughts.	Output 3.1. 100 government officials (women men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.	Outcome 3.1. Strengthened national level government capacity to reduce climate change related risks and impacts in urban areas In line with AF outcome 2	300,000
	Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One set of National guidelines for spatial / urban planning considering climate change / disaster risks developed	Outcome 3.2. Policies and plans improved to respond to urban climate change risks and impacts In line with AF outcome 7	483,014
	Total		7.83,014
5. Total components			**5,083,014**
6. Project/Programme Execution cost			533,576
7. Total Project/Programme Cost			5,616,590
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			477,410
Amount of Financing Requested			**6,094,000**

Projected Calendar:

Milestones	Expected Dates
Start of Project/Programme Implementation	06-2019
Project/Programme Closing	06-2024
Terminal Evaluation	09-2023

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project components

In order to achieve the overall project objective to "enhance community and local and national-level government capacities to address climate change-interrelated urban flood and water scarcity issues," the project combines horizontally and vertically interrelated activities: spatial strategies and concrete innovative interventions focused on reducing flood and water scarcity risks and impacts at the city and community level combined with the establishment of a national policy and regulatory framework for adaptation action at the urban level.

A specific approach to respond to the needs of women, children and youth will be taken while also considering the needs of other vulnerable groups. This is achieved through a 'gender' baseline and approach which requires a data baseline and the engagement of representatives of these groups in consultations– and where groups are formed and sustained throughout all stages of the project and through which communities participate in project implementation: in planning and executing activities and monitoring. Below, the rationale for the need of the different components is discussed.

Component 1: Community level activities

In line with AF outcomes 3 and 4 and Pakistan's government priorities (see section D), this component will focus on enhancing community and household-level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these.

This will be done through a detailed community level spatial analysis of flood and drought risks and impacts to inform and develop community level plans, to train community members (especially women and youth) and to develop practical knowledge management products. Rainwater harvesting techniques used will be a combination of traditional techniques improved with (inter) national good practices to ensure water is clean / safe. The focus area will be on poor and informal areas that are dependent on non-piped water sources, such as boreholes, that get contaminated by flood waters and poor drainage and sewerage systems. This will be done through the following outputs:

1.1. 4500 of community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques
1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate rainwater harvesting facilities at community level, and to reduce waste through awareness raising campaigns.

The proposed activities are required to increase community-level climate change-related awareness of flood and drought impacts and capacity and ownership to develop, operate and maintain interventions in target communities, which is important for the sustainability of the project, as well as the appropriate response to local needs. The proposed concrete interventions (i.e. rainwater harvesting) are also needed to provide 'prove' for best practice / replication for effective innovative water harvesting techniques at the community and household level, which are almost non-existent in Pakistan.

Besides upstream water harvesting facilities (that also reduce flood impacts downstream) (output 2.1) vulnerabilities related to water scarcity and water borne diseases at the household level need to be addressed. Therefore, rainwater harvesting systems will be installed at

households above flood water levels, allowing vulnerable (i.e. poor, informal, dependent on boreholes) households to access clean water directly. Major cause of water contamination causing health risks during floods in the target areas is waste being dumped in the drainage channels, leading an increase of flooding and health issues since contaminated flood water enters boreholes and contaminate groundwater (see figure 11). To reduce waste in drainage channels with the purpose to reduce flood impacts and health issues, awareness raising campaigns will be organized.

A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed: women and youth groups will management and maintain these facilities. Therefore trainings will focus on these groups. During the full proposal, the willingness to pay for these facilities will be assessed in detail and a model developed to save money for maintenance and replication of these facilities.

Component 2: District / city level activities

In line with AF outcomes 2 and 4 and Pakistan's government priorities (see section D), this component will focus on enhancing district and city-level up-stream water harvesting facilities (that also reduce flood impacts down-stream) and strengthen capacities to plan, construct, operate, maintain and duplicate these in areas suitable for tackling flood and drought issues at the same time. Moreover, government capacities will be strengthened to avoid people moving into high-risk areas.

This will be done through the development of spatial planning strategies / plans that consider flood and drought risks and impacts, to train district and city level officials in target areas and to develop knowledge management products. Comprehensive rain water harvesting plans will be part of the spatial planning strategies, which will include the following focus / assessments: watershed areas, settlements including mushroom growth of informal settlements and planned sectoral areas, existing and proposed land use, undertaking hydro geological survey, carrying out study of the supply of water to planned and un planned settlements identifying their sources, treatment facility, waste water treatment facility, etc.

Water harvesting techniques used will focus on up-stream water harvesting / flood reduction. International good practices will be used to ensure water can be used as 'grey' water. This will be done through the following outputs:

2.1. 40 district / city-level water harvesting facilities (small reservoirs) constructed (or smaller number if bigger reservoirs are possible)
2.2. Two ditrsict / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans. These strategies are decision-making tools for cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors.
2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plan

The proposed activities are required to sustain the interventions at district and city level and to provide 'proof' for best practice / replication for effective innovative up-stream water harvesting (and flood reduction) techniques and strategies at the district and city level.

Component 3: National level activities

In line with AF outcomes 2 and 7 and Pakistan's government priorities (see section D), this component will focus on strengthening national-level capacity to guide / direct city-level

development taking into account climate change and disaster risks and impacts, especially floods and droughts.

This will be done by improved policies and regulations that support reducing climate change urban-related flood and drought risks and impacts. This in turn will be done by developing a national urban strategy / policy and national guidelines for spatial planning strategies and building codes that take into account climate change and disaster risks and impacts, especially floods and droughts (but also heat stress and storms). Moreover, recommendations will be made about how to enforce the river act in terms of reducing people moving into high risk areas. This will be done through the following outputs:

3.1. 100 government officials (women and men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.
3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed
3.3. One set of National guidelines for spatial / urban planning considering climate change / disaster risks developed

The proposed activities are required to guide local urban development from the national level and to sustain the project at the national level by anchoring best practices, lessons and approaches to national strategies and programmes. The set of National guidelines for spatial / urban planning will be developed using the approaches and practical lessons learned at the community and city level: at the community level detailed community level spatial analysis of flood and drought risks and impacts to inform and develop community level plans (output 1.2) will conducted. This entails a detailed study of the flood and droughts impacts on the community and its assets and multiple sectors and how the community could be planned best spatially taking these risks into consideration. This information will also feed into city-level spatial strategies to be developed for the target cities (output 2.2), which will entail a strategy for spatial development for the whole city, taking into consideration flood and drought risks, also beyond city boundaries, and other relevant risks and development, such as population growth, need for services and infrastructure, etc., and by considering impacts on multiple sectors. These guidelines can be used by municipalities and communities to develop these spatial strategies, but also as a decision-making tool to manage floods and droughts and other risks on people, assets, sectors, etc., through spatial planning in and beyond the cities. In both Rawalpindi and Nowshera for instance, the source of floods come from beyond city boundaries, which needs to be included in strategies to reduce flood impacts.

Relevant institutions, especially spatial planning-related, and how the project will build on these

Pakistan's 18th constitutional amendment in 2010 ensures that urban planning and urban design, urban land-use control, and urban development and management and disaster management are primarily provincial subjects in Pakistan. As per section 87 of Punjab Local Government Act 2013, Municipal Corporations, Rawalpindi Municipal Corporation was established and operates with 5 departments namely, planning, regulations, infrastructure, finance and services. Functions of the Planning department includes spatial planning, master planning, zoning, land use planning, urban design, urban renewal and ecological balances; building regulations, prepare and implement schemes for protection of environment; enforce all municipal laws, rules and bye-laws. Infrastructure Department provides, manages, operates, maintains and improves the municipal infrastructure, including; water supply and control and development of water sources; sewage and sewage treatment and disposal; storm water drainage; establish landfill site and recycling plants; roads and streets traffic planning. Finance departments prepare annual and revised budgets; management and control of local funds including taxes, fees, charges etc. Some of the key functions of Services Department include

sanitation and solid waste collection and sanitary disposal of solid, liquid, industrial and hospital wastes, treatment and disposal including landfill site and recycling plants. This project is directly linked to annual work plans of these departments and activities will contribute and will be linked at multiple institutional structures within the municipality. More specifically under this project, formulating city-level spatial planning strategies considering climate change risks and impacts, especially floods and droughts will contribute the planning department, enhancing its decision-making capacity. Building of rainwater harvesting facilities will be coordinated with the Infrastructure and Service departments ensuring those will be incorporated into work plans of the service department and the Infrastructure Department. Project will ensure adequate representation from these departments in the training activities of government officials to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans.

Rawalpindi Development Authority (RDA) which is mostly responsible to perform planning functions complementing the Rawalpindi Municipal Corporation and Rawalpindi Water and Sanitation Agency (RWASA) which complements water and sanitation functions in Rawalpindi Municipal Corporation are other key institutional structures which will be benefitted from the project actions.

With regard to Nowshera city there are three main administrative parts—one that lies in domain of Nowshera Municipal Committee, one that lies in the limits of Nowshera Cantonment Board and the one that comes under Risalpur Cantonment Board. Similarly, Khyber Pakhtunkhwa Urban Policy Unit plays a major role in special planning in Nowshera. The project will coordinate with all these institutions to ensure that a) project outputs are contributing to special planning, b) project actions are incorporated into their annual work plans and adequate participation of officials in training programmes.

The National Disaster Management Authority (NDMA) of Pakistan established through an act of Parliament is the executing arm of National Disaster Management Commission which is headed by Prime Minister of Pakistan while all the chief ministers of provinces and certain federal ministers are its members. In each province there is a Provincial Disaster Management Commission headed by the respective chief minister of the province and operates through the respective Provincial Disaster Management Authority (PDMA). At district level there is a district disaster management authority headed by respective deputy commissioner. This multi-governance disaster management structure functions as multi-layered decision-making process which requires in Disaster Management particularly managing dams and rivers. When it comes to flood management, other institutions also play an important role. For instance, all the large dams and flood management structures come under preview of Federal Flood Commission (FCC). Consultations for the formulation of concept proposal included NDMC, FCC and NDMAs and PDMAs and will be part of the project implementation framework. This helps to ensure that institutions engage in upstream actions are well aware of the project and tools developed through the project will be shared at all levels.

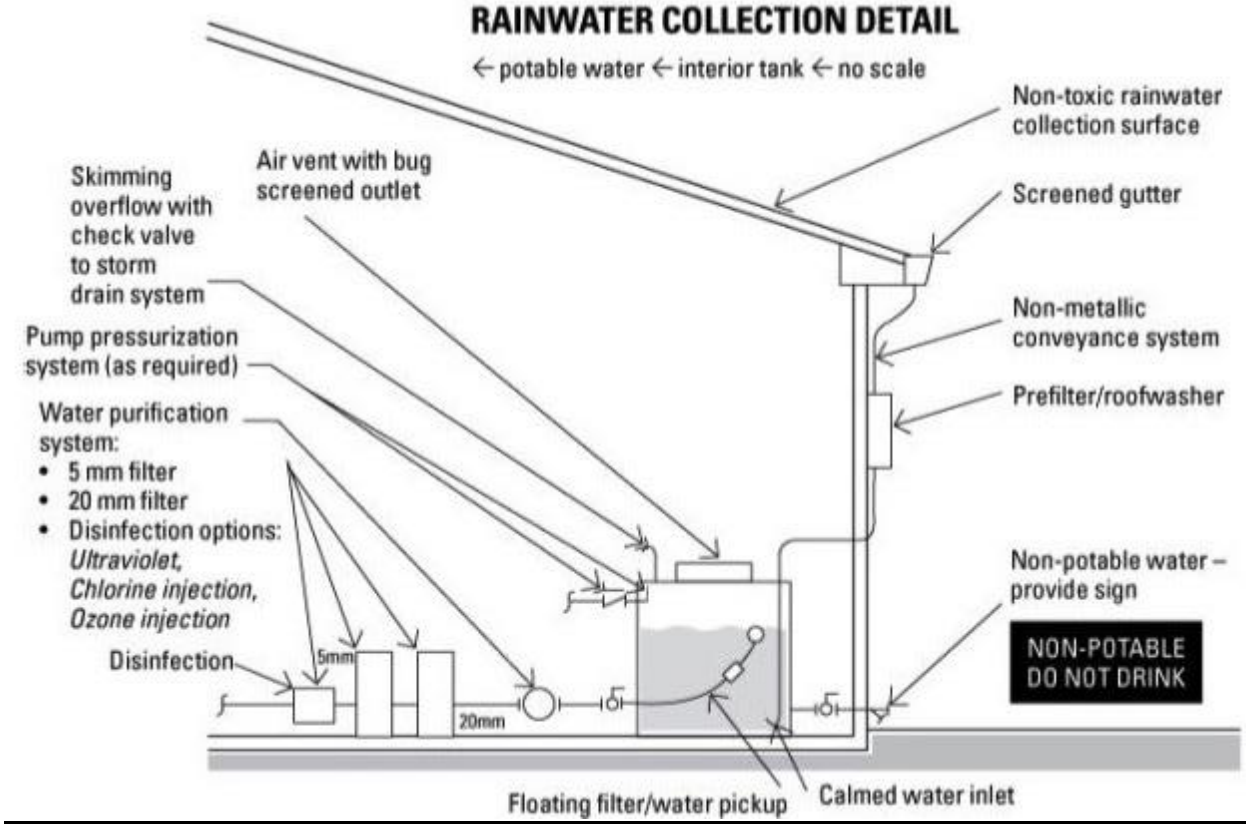
Waste Management is one of the primary municipal functions of local governments in Pakistan. The unchecked dumping of solid waste in and at the embankments of waterways including Kabul river and its tributaries in Nowshera and in Lai Nallah and its tributaries in Rawalpindi is known to increase urban flooding. The Government has taken significant institutional and infrastructure investment in solid waste management. Recently established Rawalpindi Waste Management Company is one example. The provincial government in Khyber Pakhtunkhwa is in the process of establishing Water and Sanitation Services Companies in various districts. These actions will take more of the responsibilities of infrastructure and operational activities of solid waste management. However multi-stakeholder efforts are required to make solid waste management effective and in particular ensuring sustainable waste free river banks to reduce

the flood risk. Therefore, while managing flooding is one of the main targets of proposed AF project, all efforts will be made to make the project play a catalytic role to reduce the cause that contribute to flooding including poor waste management. The project focus will limit only to advocacy on waste management through community mobilization, and coordination with concerned institutions.

Technical interventions component 1 and 2

Household level water harvesting techniques

Figure 17: possible domestic water harvesting technique with elevated storage tank.



Rainwater harvesting is an established practice in many areas and has promising prospects as a sustainable solution in Pakistan though it is new to the target cities. UNHABITAT's experience in rainwater harvesting in many parts of Pakistan has shown positive results. Likewise construction of small dams and water storage infrastructure is part of a many development interventions and dialogues.

When it comes to commercial success of rainwater harvesting technologies, there are two key aspects: increasing domestic market for products and increasing skilled labour will contribute to increase livelihoods of poor communities and local economy. This strength can be gathered from the success of domestic solar energy interventions in Pakistan in recent years. Solar energy solutions have made their ways in every corner of the country. Much can be learnt from this success. With water getting scarcer, it can safely be assumed that appropriate rainwater harvesting technologies can also succeed commercially offering new business and employment opportunities.

As regards to paying for water, many communities are already paying for water for informal water supplies and it is a major practice in urban poor. UN- Habitat's recent study on Willingness to Pay for WASH conducted in Pakistan (in Jacobabad) concluded that people are willing to pay a decent amount for better water services. Hence it can be safely assumed, that if offered affordable options, communities will be willing to pay for clean water too in shape of rainwater harvesting technologies. UN-Habitat can draw its regional experience where community led tariff structures and business models are introduced for water facilities in urban poor settlements to establish a realistic community based business model for rainwater harvesting facilities. The 'willingness' to pay and exact household contributions to establishing rainwater harvesting systems will be further examined during the full proposal development phase.

Rainwater harvesting tanks will be designed to be operational not only in times of water availability as rain water harvesting tools but also usable in dry seasons with operational benefits of filtration over storage. This makes continues usage of tanks (no idle time) and ensures routine cleaning throughout the year. Methods such as "dry system", the collection pipe "drys" after each rain event since it empties directly into the top of the tank are easy to maintain and keep cleaner. Fixing in elevated foundation can provide easy access to operate sediment removal taps. A simple, graphically illustrated maintenance guidance manual will be provided to each house-hold with orientation at the time of installation. Services if field staff of Public Health Departments who are at presently engaged in inspections of houses in the communities to control spread of Dengue fever; may be utilized for routine inspection of rainwater harvesting tanks. Moreover, A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed: women and youth groups will management and maintain these facilities. Therefore, trainings will focus on these groups.

Different International techniques are used to clean the water for drinking purposes, including 1) Boiling, 2) Adding solutions, tablets or crystals, 3) Adding chlorine, 4) Using water filters, 5) Using RO water filtration plants, 6) Iodine treatment, 7) Zonation, 8) Solar Disinfection, 9) Using cloth to filter, 10) Clay vessel filtration, 11) Flocculation, 12) Aeration, 13) Sand pressure filtration, 14) Desalination plants, 15) Sedimentation, 16) Slow sand filters. Internationally, wastewater is also treated to use water for drinking. See annex 4 for more info water harvesting techniques / options on water cleaning techniques.

Based on feasibility (costs, context, etc) and community preferences, appropriate techniques will be selected during the full proposal phase.

<u>District / city-level water harvesting techniques and locations</u>

Besides introducing rainwater harvesting technologies at household level, the same will also be developed at community scale. The target areas in both cities are densely populated. This leaves limited porous surfaces that could facilitate the seepage of rainwater to recharge aquifers. To address this problem, upstream water harvesting facilities will be constructed in public spaces without use, to reduce downstream flood impacts and to enhance water accessibility at the same time. To sustain these initiatives; policy and technical guidelines will be made part of respective spatial plans, building byelaws as well as national urban development policy and strategies.

With respect to the development of new water reservoirs that could serve dual purpose of water storage to address the issue of seasonal flooding as well as to meet cities growing water needs, the following optional locations have been identified at this stage. However, it is pertinent to mention that identification of and development of water reservoirs and their cost estimation

require thorough technical and feasibility studies and environmental and social impact assessments, which will be conducted at the full proposal development phase. The Pakistan team will consult the Federal Flood Commission, Punjab Small Dam Organization, Capital Development Authority and municipal institutions of Rawalpindi and Nowshera to further discuss in detail the exact sites and estimated costs for developing small reservoirs that could serve the intended purpose. For the sake of project budgeting, the UN-Habitat Pakistan team found that the average cost given by Punjab Small Dams Organization for a small dam is around USD 30.000. Depending on the feasibility and environmental and social impact assessments, which will be conducted during the full proposal development phase, the dams could be designed larger or smaller.

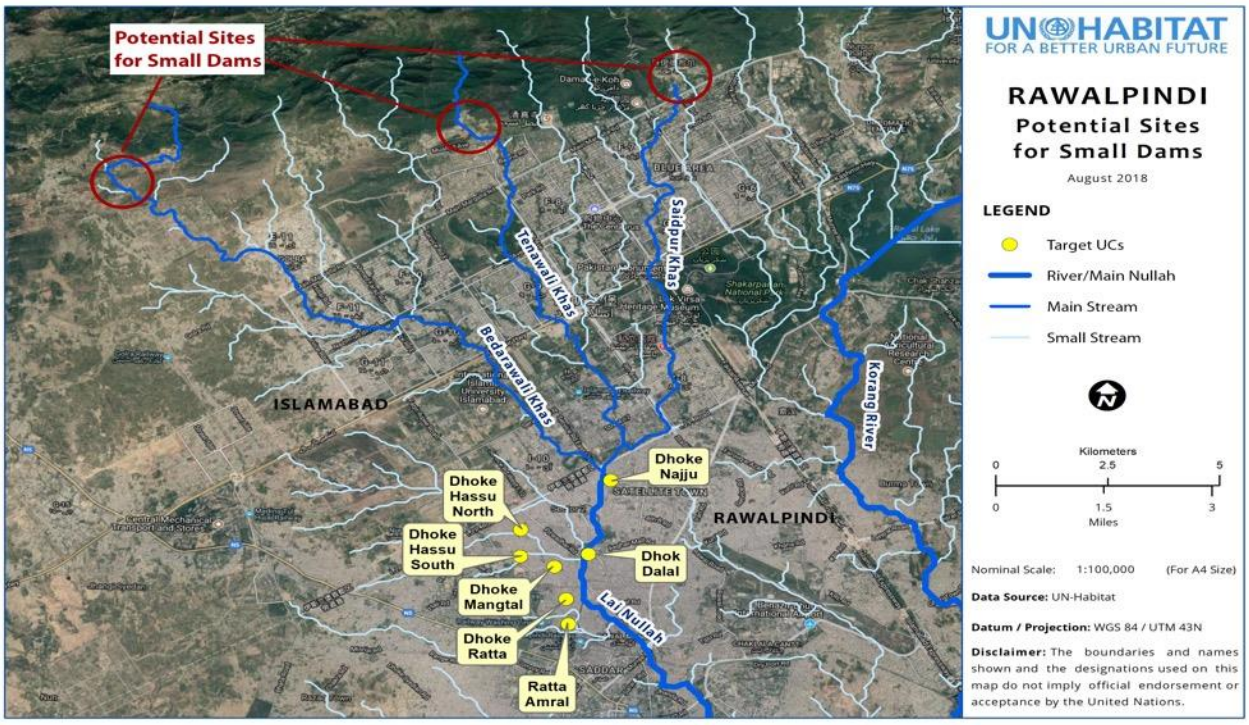
Potential sites for small dams, reservoirs and lakes for Rawalpindi/Islamabad:

1. On Saidpur khas at the foothills of Margallah hills
2. On Tenawali Khas at the foothills of Margallah hills
3. On Bedarawali khas at the foothills of Margallah hills

These tributaries feed into the main stream of Nullah Lai and also cause localized flooding.

Various streams coming down the Margallah Hills are perennial which supply water continuously throughout the year. During the rainy season, the volume of water increases which flow in to the Korang River and Lai Nallah and finally to Soan River—a minor tributary of River Indus. This water goes unutilized and is wasted ultimately in to the sea. If some suitable types of storage tanks/lakes or dams are constructed over these perennial streams, this could be used for direct water harvesting purposes or for recharging the ground water thus raising the water table down the stream. For security purposes such tanks/lakes can be built inside large units like Naval Headquarters, Pakistan Air force Headquarters, Faisal Mosque, International Islamic University, Marghuzar Zoo, Japanese garden, other public land, etc., wherever feasible. Similarly minor water storage projects could be identified in the PNS Hafeez Naval Hospital, Air University, Bahria University. A few mini dams have also been constructed by local population in surrounding villages which can be used as sample for this project. Examples of such intervention does exist in NUST campus area in Islamabad. They have developed 4 artificial lakes which meet the requirement of campus water by recharging the ground water for the tube well (see section D).

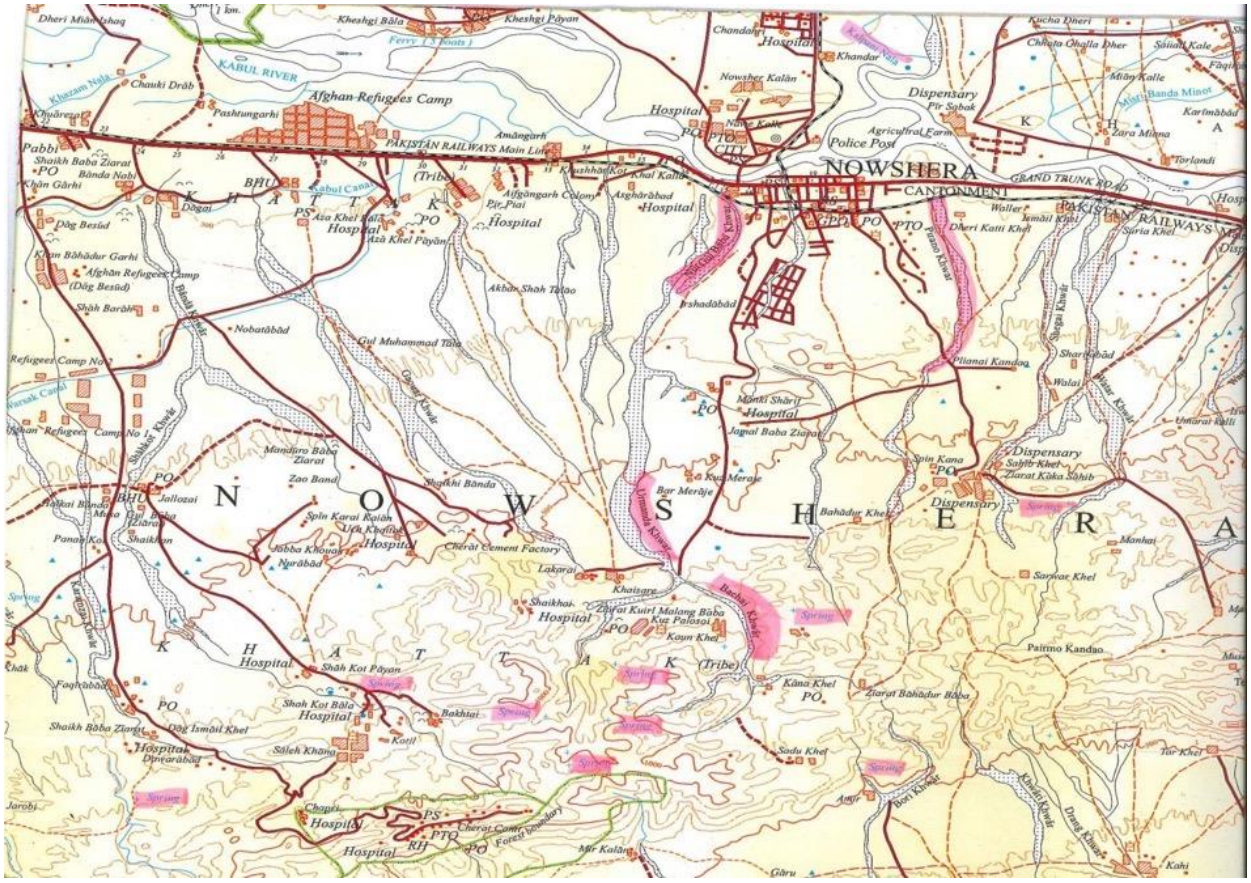
Figure 18: potential sites of small water reservoirs around Rawalpindi / Islamabad



Potential sites for small dams, reservoirs and lakes for Nowshera:

The foothills of the Cherat Mountains over Bachai Khwar,Urmanda Khwar and Nur Gul Baba Khwar and springs along the water courses (Khwar). The options are highlighted below.

Figure 19: potential sites of small dams around Nowshera



B. Economic, social and environmental benefits

The fundamental benefit of the project is to save human lives, protect community assets and increase water security through flood protection and water harvesting measures. Further, the project will produce co-benefits in terms of water-related-livelihood protection and income security, improved quality of human life, community capacity-building and women and youth empowerment, and reduction of environmental degradation, as follows:

Table 9: Expected economic, social and environmental project benefits

Type of benefit	Baseline	With/after project
Economic	Climate change is already leading to economic losses and inefficiency of water collection caused by floods and droughts, which impact households, assets, markets, boreholes, etc.	Component 1: ❑ Recurrent flooding episodes in target areas of both Nowshera and Rawalpindi result in structural damages to housing structures and loss of household items thus draining meager household savings and their fragile economies. The interventions will positively contribute in arresting these recurrent losses. - ❑ Accessing water for household consumption puts a daily strain on households' productive time in general and that of women and children in particular. With improving this access, households in general and women and children in particular allocate the saved

		time for more economically productive activities like livelihood and education, thus bringing positive changes in household economies. ❑ Water borne diseases increase the health cost burden for poor households on one hand and robbing them of productive time on other. A reduction in health burden thanks to easier access to clean drinking water will bring positive economic benefits to poor households. ❑ Recurrent flooding also affects business activities in the target areas as these are home to some of these cities' main commercial centers. With reduction in incidences of flooding, these business activities will also be positively impacted thus contributing to community and city scale economies. ❑ Rainwater harvesting is known to be a method for economically efficient use of natural resources. ❑ Rainwater harvesting will open new business and employment opportunities (Note: At the full proposal scale, an effort will be made to somehow quantify these anticipated economic impacts as currently no data is available in this regard) Component 2: ❑ The strategies will contribute in addressing the recurrent localized and large-scale flooding events in the target districts. As highlighted in the concept note, some of the main business centers and activities are concentrated in areas which is vulnerable to flooding. Thus, the district/city scale plans and strategies will positively contribute in climate resilience of these business activities bringing many economic benefits to community and city scale economies. ❑ The rainwater harvesting will promote economically efficient use of natural resources at city/district scale. (Note: At the full proposal scale, an effort will be made to somehow quantify these anticipated economic impacts as currently no data is available in this regard) Component 3: ❑ Successive flood induced disaster events in Pakistan have shown, that poorly resourced district, provincial and federal governments have to slice regular development allocations (mostly for education and health sectors) to make available funds for emergency relief, rescue and infrastructure rehabilitation. Effective plans and strategies for disaster risk reduction and management and climate resilience, as proposed in the concept note, will positively contribute in checking these trends and will in turn reduce pressure on meager development allocations. ❑ The rainwater harvesting and climate resilience as proposed in the concept note will contribute to promote a culture of economically efficient use of natural resources and reaping economic benefits from climate adaptation and resilience at national scale.

Social	Climate change is already leading to negative social impacts, especially caused by floods and droughts, leading to rural –urban migration and social tension and incoherent development.	Component 1: ❑ Consistent vulnerability to floods have cause a general sense of insecurity in the target households and communities. Once this vulnerability is reduced a relative sense of security will enhance. ❑ Flooding events in the target cities also cause disruption of education attainment for children as large number educational institutions are also located in flood prone areas. The intervention will contribute to school safety and continuation of children's education. ❑ The disease burden currently households have to carry thanks to scarcity of clean drinking water reduces households' social wellbeing. The project will reduce this burden and hence will contribute to their social wellbeing. ❑ The considerable time, especially poor women and children have to allocate in hauling water compromise their leisure opportunities. By easing this burden, the project will contribute in bringing more leisure time for them. ❑ Community consultations have shown that water related disputes are common in target areas. These disputes, in some cases, have sparked violence. By addressing the water scarcity, the project will address this issue and thus will contribute in strengthening neighborliness and community cohesion. ❑ Continuously seeking favors from neighbors and water providers on part of poor households to access water causes them to compromise on their self-esteem and dignity. The project will bring them this socio-psychological relief. ❑ The project will also contribute in strengthening the spirit of self and mutual help and sufficiency among the target communities. With them being better mobilized and organized, the target households and communities will be in a much better position to negotiate for their water, development and protection to disaster rights with the authorities and service providers. Component 2: ❑ With introduction of participatory and gender and poor sensitive plans and strategies at city and district scale will contribute in amplifying all social benefits anticipated to be reaped by the project interventions at community level as mentioned above. With the proposed approach, the project will contribute in introducing a new way of planning with wider participation of communities and stakeholders in a gender and poor sensitive manner. This will in turn contribute in making planning a social justice tool. Component 3: ❑ The project's three-tiered planning approach—community, city/district and provincial/national is designed to amplify community learning at all tiers of governance and to develop an integrated and mutually supportive planning approach. It is anticipated that with

		the introduction of much needed provincial and national level urban development plans, policies and strategies which are gender, poor, disaster and climate sensitive will contribute in turning rapid urbanization of Pakistan into a social, economic and environmental opportunity
Environmental	Climate change is already leading to negative environmental impacts, especially differences in temperature and precipitation, leading to floods and droughts, which in turn leads to erosion, deforestation, etc.	Component 1: ❑ Currently the target communities are suffering from a complex nexus between climate change, floods, water scarcity and contamination, environmental degradation and human health. The community level activities including mobilization, sensitization and introduction and promotion of water harvesting as well as awareness about impacts of waste on floods and health will bring many environmental benefits to communities including: better sanitation and hygiene conditions, recharging of aquifers, reduced pollution levels, environmentally efficient use of natural resources and improved sensitization towards climate and environment. The project aims to directly contribute in reducing pressure on groundwater which has resulted in drastic lowering of water tables. Component 2: ❑ The city/district level plans and strategies will contribute in better management of urban wetlands and their environmentally sustainable integration into larger urban development interventions. The flood management measures will also contribute in addressing environmental challenges associated with flooding especially its impact on built and natural environments. At full proposal scale these factors will be further explained with local examples and case studies. Component 3: ❑ The national and provincial level strategies and plans will have environmental sustainability as cross cutting theme besides gender and poor sensitivity. The proposed plans, policies and strategies that the project will facilitate to develop will contribute in turning rapid urbanization of Pakistan from an environmental and climate challenge to a climate adaptation and environmental sustainability opportunity.

Groundwater plays a vital role in irrigation, urban and rural water supplies and in sustaining ecological service, including the base flow of rivers. Due to water scarcity, the intense use of groundwater is becoming a source of concern as it is the ultimate water buffer. Making better use of groundwater through recharge, retention and reuse can reduce the impact of climate change.

Underground water and ground wells can be best managed in Pakistan to ensure sustainability and adapt to climate change by following measures proposed in National Action Plan on Sustainable Consumption and Production.

1. Protect groundwater through management and technical measures like building dams for artificial recharge especially of threatened aquifers, and adopt concept of integrated water resources management.
7. Create awareness and promote rain-water-harvesting at household and local levels
8. Develop and implement groundwater regulatory framework to control and optimize groundwater extraction.
9. Initiate programmes for implementation of rules and monitoring of groundwater, including its quality, quantity, withdrawal and recharge potential.
10. Adopt participatory approach in water management that will engage all stakeholders particularly marginal groups.
11. Carry out periodic scientific monitoring of water aquifers and identify hot spot areas of contamination and their sources.

The first two measures are in line with the proposed Adaptation Fund Project and will support sustainability of water accessibility

Approach to ensure equal distribution of benefits to the most vulnerable

In annex 2, a gender approach and baseline is included. This is a 'work-in-progress' annex, which means all details will be provided during the full proposal development phase. At this stage a 'basic' approach and baseline for women is provided, but more details will be included, including specific approaches for children and youth

C. Cost effectiveness

The National Economic & Environmental Development Study (NEEDS) shows that the average cost of adaptation to flood disasters in Pakistan ranges between US$ 2.0 - 3.8 billion per annum, depending on the frequency and intensity.[31] Through spatial planning and protective infrastructure, costs associated with damage and loss, especially caused by floods will be reduced, especially if this spatial model will be replicated in other settlements in Pakistan.

UN-Habitat analysed both individual proposed interventions and the total package of proposed interventions from a cost-perspective point of view (besides other activity selection criteria related to sustainability and potential environmental and social risks) to maximize the beneficiaries reached and impacted. Although larger upstream water harvesting / flood reduction interventions may be more cost-effective than multiple community / household level flood resilient water harvesting facilities, this project proposes to set-up both. The reason is that community / household level flood resilient water harvesting facilities will provide direct benefits to the most vulnerable people in the most vulnerable communities and because it will allow the testing of community / household-level innovative techniques that can be replicated elsewhere.

Cost-effective rationale component 1: setting-up community- and household-level flood resilient rainwater harvesting facilities is a cost-effective way of supplying clean water in areas which experience droughts, where drinking water (from boreholes) is contaminated by floods and poor drainage and sewerage systems, which is often in informal areas, especially if innovative techniques will be replicated elsewhere.

Flood can influence surface water quality because the rainwater picks up surface materials, soils, wastes and other pollutants in runoff from slopes, open grounds, lawns, farms, streets,

[31] Pakistan's INDC, p14

factories, and other areas into the receiving water bodies. Contamination of large water bodies or groundwater through infiltration of flood water through pumps / wells, is often much higher during and immediately after rainstorms. Rising temperature increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas.[32]

Both is the case in both target communities. Target communities / households have little support from municipalities to access clean water because of the informal status of the community (i.e. no basic services). Tube wells have been dug by community members themselves but these are now a lost investment because of groundwater contamination.

Alternative water supply options are boreholes, piped water, etc. As for boreholes, the risk of water contamination still exists. Regarding piped water, this could be designed in a flood resilient manner (e.g. pipes above flood levels), but installation is a challenge in the dense and informal target areas and management would not be done by the direct beneficiaries, which could lead to unforeseen high user costs. Therefore rainwater harvesting is the remaining cost-effective option to provide clean water (which is a priority in target areas (see table 6 and 7) to people that have alternative option than to use contaminated groundwater (through boreholes) or to collect water in other areas of the city (see figure 11 as example) due to their informal status / high poverty.

Community-level capacity building is proposed to ensure ownership and sustainability of the project and proposed activities, including establishing operation and maintenance arrangements, which in turn will avoid costs when infrastructure is not used and maintained properly.

Alternatively, interventions are planned from state or municipal level, but this would reduce ownership of the project and interventions and thus have negative effect on sustainability and related costs.

Cost-effective rationale component 2: Land use planning strategies are considered to be one of the most cost-effective ways to understand and respond to climate change risks and vulnerability, especially to avoid future development in risk areas (and cost associated with this potential risk, such as destroyed houses and assets. Besides that, proposed larger upstream water harvesting / flood reduction interventions are cost-effective because these will address flood and water scarcity issues at the same time and for a large area.

Alternatively, infrastructure interventions, such as strengthening of drainage channels and construction of resilient assets and houses in areas at risk of floods could be proposed, but this would be costlier in the dense target areas.

From a sustainability point of view, capacity building of government institutions will improve the long-term impact of the project, including associated avoided costs related to floods and drought impacts.

Cost-effective rationale component 3:
Similar to land use planning strategies, at the district/city level, the development of National strategies to reduce flood and drought impacts, especially when considered comprehensively, in

[32] Mosley, Luke M. "Drought impacts on the water quality of freshwater systems; review and integration." *Earth-Science Reviews* 140 (2015): 203-214.

urban areas, can be considered to be a cost-effective way to avoid flood and drought-related costs throughout the country – it will allow government institutions to make strategic choices, also from a cost-effective point of view.

The proposed AF Project will play a catalytic role in triggering paradigm shift by incorporating climate change concerns into the national and regional urban development strategy. In Pakistan for the time being there is no urban development policy. Most of the urban development is dominated by fragmented projects.

Table 10: Cost-benefit analysis of proposed interventions

Interventions / activities		Target Community	Estimated nr of beneficiaries	Estimated cost (US$) and cost-effectiveness of direct beneficiaries
Priority investments	**Detailed activities**			
Component 1 Community level activities:	Output 1.1. (concrete) 4500 of community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	Rawalpindi: especially UC 4,5 and 6, but also 1,2, 12 and 37 Nowshera Kalan (including UCs namely Nowshera City, Kabul River, Chowki Town and Nawan Kallaey)	Direct: 35000 Indirect: around 200.000	USD 57 pp
	Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate water harvesting facilities at community level, and to reduce waste in drainage channels through awareness raising campaigns	Rawalpindi: especially 4,5 and 6, but also 1,2, 12 and 37 Nowshera Kalan (including UCs namely Nowshera City, Kabul River, Chowki Town and Nawan Kallaey)	200.000	USD 4 pp
Component 2 District / city level activities	Output 2.1. (concrete) 40 district / city-level water harvesting facilities constructed (or smaller number if possible)	Rawalpindi: especially UC 1,2, 4,5, 6, 12 and 37 + whole of Rawalpindi Nowshera Kalan + other parts of Nowshera District	Direct: 200.000 (for floods) Estimations for water use to be made	USD 6 pp

	Output 2.2. Two district / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans. These strategies are decision-making tools for cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors	Rawalpindi City Nowshera City	2 million 200.000	USD 0,00009 pp
	Output 2.3. 50 government officials trained and guidelines developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans	Rawalpindi City Nowshera City	Direct: 50	USD 400 pp for training only
Component 3 National level activities:	Output 3.1. 100 government officials (women men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.	Concerned federal and provincial government officials	Direct: 100	USD 400 pp for training only
	Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One set of National guidelines for spatial / urban planning considering climate change / disaster risks developed	Federal and Provincial Governments	Not relevant	Not relevant

Altogether, the project will be cost-effective by:

- Avoiding future costs associated with damage and loss due to climate change impacts (especially floods and drought) and to ensure the interventions are sustainable;
- Efficient project operations because of 'in-house' technical support options and capacity building expertise and because of direct partnering with government institutions and university (thereby building their capacity as well as reducing costs);

- ❑ Community involvement through community capacity building
- ❑ Selected technical options based on cost-, feasibility and resilience/sustainability criteria

D. Consistency with national or sub-national strategies

With its highly sensitive ecosystems and recent history of frequent natural disasters, Pakistan has placed great emphasis on climate change policy, planning and implementation. Pakistan's response has been closely aligned with its strategies for sustainable development, environmental protection, achieving the sustainable development goals (SDGs) (to which Pakistan's "Vision 2025" is linked) and objectives of the Convention on Climate Change. Adoption of the National Climate Change Policy (2012) and National Disaster Risk Reduction Policy (2013) provided a comprehensive framework for policy goals and actions towards mainstreaming climate change, especially in economically and socially vulnerable sectors of the economy. A follow-up to these policies was the launch in 2013 with the Framework for Implementation of the Climate Change Policy (2014-2030), which outlines the vulnerabilities of various sectors to climate change and identifies appropriate adaptation and mitigation actions. The Framework document was developed to serve as a catalyst for mainstreaming climate change concerns into decision-making at national and sub-national levels and to create an enabling environment for an integrated climate-compatible development process. International communication to the UNFCCC followed with the Nationally Determined Contribution in 2016. Most recently, the National Flood Protection Plan (2016) and National Water Policy have been launched (2018), which propose actions for (climate change related) flood management and recognize water scarcity as an emerging (climate change related) priority.

This project has been designed to align with above national, sub-national and sectoral development policies, strategies and plans on development, climate change and disaster resilience. To respond to the most current government priorities, this proposed project is especially aligned with the National Flood Protection Plan and National Water Policy.

At the local level, functional plans related to climate change or spatial planning exist for Rawalpindi or Nowshera. The disaster management plans of these cities do mention climate change. The AF project will address this situation by facilitating concerned institutions to develop climate and DRR sensitive spatial and sectoral plans. It is pertinent to mention that AF project's priorities are.aligned.with broader national plans and policies.

Table 11: summary of the main climate change related policies and national and sectoral policy priorities that align with this project

Policy/Document	Year submitted/ ratified	Policy priorities that align with this project
Climate change priorities		
Pakistan NEEDS study[33]	2011	Adaptation assessment: Water resources (flooding and water demand): ☐ Flood plain management along the flood corridor to ensure minimum damage to human lives and infrastructure during floods. ☐ Climate proofing of future infrastructure investments to cater to the threats of climate induced disasters such as floods.
National Climate	2012	The National Climate Change Policy states a number of priority areas: **1) Water resources**

[33] https://unfccc.int/files/adaptation/application/pdf/pakistanneeds.pdf

Change Policy[34]		2) Agriculture and livestock **3) Human health** 4) Forestry 5) Biodiversity **6) Disaster preparedness** **7) Socioeconomic issues (poverty, gender)**
Framework for implementation of the climate change policy (2014-2030)[35]	2013	Relevant sectors, objectives and strategies: **<u>Water sector:</u>** Objective 1: Conserve water Strategy 1.2. Local rainwater harvesting measures Objective 3: Integrated water resource management Objective 6: Develop resilient water infrastructure Strategy 6.1. Water storage capacity Strategy 6.2. Irrigation infrastructure **<u>Disaster preparedness sector:</u>** Objective 3: Develop integrated hazard mitigation strategies Objective 4: assess future likely flood levels in Indus river system Objective 5: natural disaster information and early warning Objective 6: develop resilient infrastructure **<u>Health sector:</u>** Strategy 1.4. Clean drinking water **<u>Urban planning sector:</u>** Objective 1: Introduce innovative town planning Strategy 1.4. Hazard mapping and zoning
Nationally Determined Contribution[36]	2016	The NDC focuses primarily on mitigation issues, but outlines a number of relevant adaptation priorities: **Short term** Strengthen adaptation planning capacity Strengthen disaster risk management capacity **Medium term** Improving irrigation Water resource management Climate resilient infrastructure
National development priorities		
National Sustainable Development Strategy: Pakistan's pathway to a sustainable & resilient future.	2012	NSDSS has primary focus on promoting 'green economy' and outlines environment sustainability as a key pillar. Under that it focuses on: - Preparing for climate change and its accompanying uncertainties through comprehensive adaptation and mitigation planning and concrete implementation measures - Improve environmental governance at all levels and enhance community-level environmental management by strengthening the capacity of union councils, tehsil municipal administration and district governments (local level). - Undertake strategic adaptation responses at the policy,

[34] http://www.gcisc.org.pk/National_Climate_Change_Policy_2012.pdf
[35] http://www.gcisc.org.pk/Framework%20for%20Implementation%20of%20CC%20Policy.pdf
[36] http://www4.unfccc.int/ndcregistry/PublishedDocuments/Pakistan%20First/Pak-INDC.pdf

		management / operational and community levels with a focus on facilitating bottoms up adaptation with maximum localized ownership. The inevitable climate adaptation response should be driven by a focused adaptation program and plan.
Pakistan 2025[37]	2014	Blueprint for growth (recognizes global warming and climate change as one of the priority areas): In the physical domain, the major threat is posed by climate change, associated with increased frequency and intensity of floods and hurricanes, prolonged droughts and growing water stress shift of disease vectors, and the frightening possibility of the melting of the Himalayan icecap (page 16).
Sectoral priorities		
National Environmental Policy	2005	It provides an overarching framework for addressing the environmental issues facing- Pakistan, particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification, natural disasters and climate change
National Disaster Risk Reduction Policy[38]	2013	Relevant Policy objectives: 2.4.1. Creating an integrated national capacity to identify and monitor vulnerability and hazard trends including potential climate change impact 2.4.3. Strengthening an integrated disaster preparedness and response capacity from the local to the national level 2.4.4. Promoting development planning that considers and addresses disaster risks alongside environmental and climate change concerns 2.4.5. Strengthening the structural and non-structural resilience of key infrastructure and lifelines in Pakistan 2.4.6. Strengthening capacity at national and provincial levels to facilitate and provide support to the implementation of DRR policies, plans and programs across sectors and in high-risk areas 2.4.7. Strengthening Local Level Risk Reduction capacity focusing upon communities, and supportive linkages with Union Councils, tehsils and districts 2.4.8. Ensuring DRR is systematically integrated into recovery and reconstruction programming, “building better, safer and stronger” and informing DRR mainstreaming in general
National flood protection plan[39]	2016	Relevant planning strategy The plan recognised the National Water Policy as an important strategy to be implemented in parallel: The planning strategy has thus following relevant elements: - Reducing flood: 1. Dams and reservoirs 2. High flow diversions 3. Channel improvement - Reducing susceptibility to damage: 1. Flood Forecasting and Early Warning 2. Construction of flood protection and river training works i.e. levees, dikes, spurs etc.

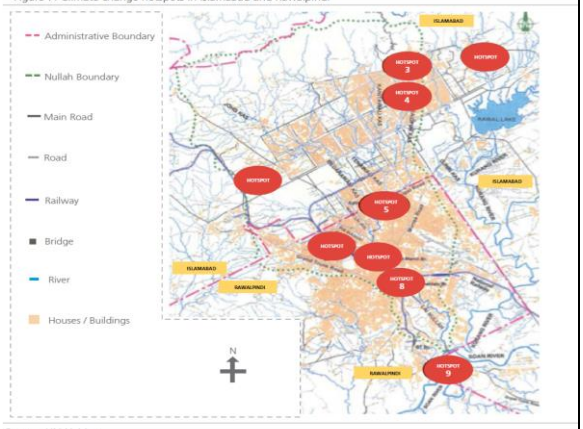
[37] http://fics.seecs.edu.pk/Vision/Vision-2025/Pakistan-Vision-2025.pdf
[38] http://www.ndma.gov.pk/Documents/drrpolicy2013.pdf
[39] http://mowr.gov.pk/wp-content/uploads/2018/05/National-Flood-Protection-Plan-IV-NFPP-IV-1.pdf
http://www.lead.org.pk/lead/Publications/Visual%20Guide%20National%20Flood%20Protection%20Plan-IV.pdf

National water policy[40]	2018	Most relevant policy objectives: 2.2. Augmentation of the available water resources of the country through judicious and equitable utilization via reservoirs, conservation and efficient use; 2.3. Improving availability, reliability and quality of fresh water resources to meet critical municipal, agricultural, energy, security and environmental needs; 2.4. Improving urban water management by increasing system efficiency and reducing non-revenue water through adequate investments to address drinking water demand, sewage disposal, handling of wastewater and industrial effluents; 2.7. Providing food security and expanding water availability to help adapt to climate change, population and other large-scale stresses; 2.12. Flood management to mitigate floods and minimize their damages; 2.13. Drought management with emphasis on long term vulnerability reduction; 2.15. Promoting appropriate technologies for rain water harvesting in rural as well as urban areas; 2.16. Regulating groundwater withdrawals for curbing over-abstraction and promoting aquifer recharge; 2.21. Profitable use of flood water towards promotion of local irrigation practices; 2.27. Climate change impact assessment and adaptation for sustainable water resources development and management; Most relevant priorities: 3.2 Storage: The most important instrument of mitigation against the impact of climate change on water resources is storage. If the pattern of rainfall becomes erratic with more than average rain in one year and a drastic reduction in the next years' rainfall, the only to conserve the surplus rainwater in wet years is to store it and release it in dry years, when required. For storage and new irrigation projects a national master plan must be developed which must cater for storage, floods, arid areas, irrigation, urban water and tariff rationalization. 3.3 Leveraging Technology: Adoption of new technologies is urgently needed Relevant water conservation needs: 7.3 It is recognized that the large annual and seasonal variability of fresh-water availability makes it necessary to: - Build small and medium dams for local and regional use; - Build check dams and delay action dams for recharge of aquifers and to reduce the flow velocities and erosion; - Recharge the underground aquifers during floods and surplus water flow periods for later use. - Provide subsurface dams, wherever feasible. 7.4. The Water Conservation Plans shall include: - Adoption of rainwater harvesting technology. - Adoption of water conservation techniques/technologies at the farm

[40] https://drive.google.com/file/d/17VO_3ysV5s-dEmMeAfKlOxCnV5yBFvlq/view

		level.
National Sanitation Policy	2006	- The sanitation policy covers solid waste management, to which this project will align
Sub-national priorities		
Rawalpindi and Nowshera Development and Strategic Plan		The project is in line and will ensure consistency with: - Annual plans - Structure plan - Local plans - Sectoral plans
The flood management plan of Rawalpindi And Rawalpindi district disaster risk reduction plan	2009	The following areas are identified as being most vulnerable to floods: - Dhoke Najju - Zia ul Haq Colony - New Phagwari - Mohallah Raja Sultan - Dhoke Ratta - Ratta Amral - Gawalmandi - Javed Colony - Chamanzar - Tipu Road - Dhoke Ellahi Bakhash All these localities are located along Lai Nallah.
Nowshera district disaster risk reduction plan	2014	Priority Areas: - Established the institutional and legal system for disaster management - Prepare disaster management plans at various levels - Conduct multi-hazard, vulnerability and risk assessment - Establish multi-hazard early warning and evacuation systems - Promotion of Training, Education and Awareness in relation to DM - Strengthen programs on disaster risk reduction at local level - Infrastructure development for disaster risk reduction - Mainstreaming disaster risk reduction into development - Establish District Emergency response System - Capacity Development for Post Disaster Recovery

Figure 7. Climate change hotspots in Islamabad and Rawalpindi



Source: UN-Habitat

E. Compliance with relevant national technical standards

Environmental and social impacts assessment requirements and procedures

Promulgation of an Ordinance in 1983 followed by the Pakistan Environmental Protection Act, 1977, made EIA a legal requirement. For enabling the project proponents in designing EIAs, the Pakistan Environment Protection Agency (Pak-EPA) first developed an elaborate form, and later completed guidelines and regulations. Presently, EIAs are conducted for all large developmental

projects. Devolution of environmental matters to the provinces has caused uncertainty about the Environmental Act and the role of Pak-EPA.[41]

Projects Requiring an EIA (Screening)

Section 12 of the Federal and Punjab Acts require filing of an EIA for projects that are likely to cause adverse environmental effects. The term "adverse environmental effect" means impairment of, or damage to, the environment and includes: (a) impairment of, or damage to, human health and safety or to biodiversity or property; (b) pollution; and (c) any adverse environmental effect as may be specified in the regulations (§ 2 (i)). Primarily, the statutes require Rules/Regulations to provide for lists of projects requiring an IEE/EIA. As per the requirement of the Statutes, the Regulations 2000 (Regulation 3 and 4, Schedule I and II) list categories of projects requiring either IEE or EIA. For an overview see annex 2

Under this regulation, proposed activities under output 2.1. require an IEE- Regulation 3**:**

F. Water management, dams, irrigation and flood protection

- ☐ Dams and reservoirs with storage volume less than 50 million cubic meters of surface area less than 8 square kilometres
- ☐ Irrigation and drainage projects serving less than 15,000 hectares.
- ☐ Small-scale irrigation systems with total cost less than Rs.50 million.

The IEE will be prepared during the full proposal development phase following Federal government and sectoral guidelines and following steps / processes as described in the 2014 Government of Pakistan and International Union for Conservation of Nature and Natural Resources. Environmental Impact Assessment Handbook for Pakistan.[42]However, it will also assess potential risks and impacts in line with the AF ESP and GP considering the 15 AF principles. This will be not only done comprehensively for output 2.1., but also for all other activities.

Table 12: overview of relevant national technical standards and how the project complies to these

Expected concrete output/intervention	Relevant rules, regulations, standards and procedures	Compliance, procedure and authorizing offices
Output 1.1. (concrete) 5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	- Minimum drinking water quality standards proposed by WHO - Applicable national and provincial drinking water quality standards - Building byelaws applicable in Rawalpindi and Nowshera - Applicable standards and guidelines by Rawalpindi Water and Sanitation Agency (RWASA) and Tehsil Municipal Administration Nowshera - Guidelines as enshrined in National Drinking Water Policy	The project team will ensure due consultation with MoCC, Provincial Environmental Protection Agencies (EPAs) of Punjab and Khyber Pakhtunkhwa, Rawalpindi Water and Sanitation Agency (RWASA) and Tehsil Municipal Administration of Nowshera besides involving respective communities to select appropriate household level water harvesting technologies. In the due course, input will also be taken from National Disaster Management

[41] http://cmsdata.iucn.org/downloads/niap___eia_handbook.pdf

[42] http://cmsdata.iucn.org/downloads/niap___eia_handbook.pdf

		Authority and respective provincial and district disaster management authorities to incorporate resilience to disasters and climate change elements in this intervention. The community level interventions will be steered by Shehersaaz by taking along respective Union Councils and community based organizations.
Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate water harvesting at community level, and to reduce waste in drainage channels through awareness raising campaigns	- Punjab Local Government Act and Khyber Pakhtunkhwa Local Government Act call for preparation of Union Council Level development plans. The prescribed requirements for preparation of these plans will be followed. - NDMA's guidelines for working with vulnerable communities and groups. - Planning guidelines from Punjab and Khyber Pakhutunkhwa Planning and Development Departments - Applicable national and provincial laws - Annual Development Plans of Rawalpindi Water and Sanitation Agency, Rawalpindi Municipal Corporation, Nowshera Tehsil Municipal Administration	Integrated union council level plans will be developed with active participatioin of elected representative of concerned union councils and their administration; officials and elected representatives of Nowshera and Rawalpindi's municipal corporations; target households and their community based organizations. This process will be steered by Shehersaaz with input from Project Steering Committee. All efforts will be made to keep these UC level plans aligned with Annual Development Plans of Rawalpindi WASA, Rawalpindi Muncipal Corporation, and Nowshera Tehsil Municipal Administration. National Disaster Management Authority's Children and Gender Cells guidelines, where applicable, and Community Based Disaster Risk Management Guildelines will also be followed to ensure the participation of men, women, elderly, children and youth, transgender and members of religious and ethnic minorities.
Output 2.1. (concrete) 40 district / city-level water harvesting facilities (small reservoirs)	- National and Provincial Environmental Protection Acts - Applicable national and	By taking into account legal and planning requirements; detailed assessments and feasibility studies will be

constructed (or smaller number if bigger reservoirs are possible)	provincial laws for natural and artificial water bodies and water supply schemes - Land use / master plans of Rawalpindi, Nowshera and Islamabad[43] - Relevant water sector development plans and strategies of federal government, Punjab, Khyber Pakhtunkhwa, and Rawalpindi and Nowshera Districts.	undertaken by hiring the services of water sector development experts through a transparent and competitive bidding process. UNHABITAT will take lead in this regard in due consultation with Project Steering Committee. Technical input will be sought from Federal Flood Commission, Ministry of Water Resources, Punjab Small Dam Organization, Islamabad Capital Territory Administration, Capital Development Authority, Rawalpindi Municipal Corporation, Nowshera Tehsil Municipal Administration and Pakistan Council of Research in Water Resources (PCRWR).
Output 2.2. Two city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans	- Urban Planning Guidelines from Punjab Urban Unit and Khyber Pakhtunkhwa Urban Unit. - Urban Planning Guidelines and requirements by provincial Planning and Development Departments of Punjab and Khyber Pakhtunkhwa. - Local Government Acts of Punjab and Khyber Pakhtunkhwa (both provide for and emphasize on preparation of Master / Land use/Spatial Plans for urban centers - National, Provincial and District Disaster Management Plans - Good practices by UNHABITAT and Shehersaaz - Annual Development Plans for Punjab, Khyber Pakhtunkhwa, Rawalpindi and Nowshera Districts. - Incumbent master plans for Nowshera and Rawalpindi	UNHABITAT will take a lead and will extend technical and financial support to concerned municipal/local government institutions for preparation of these plans. Broad based consultation and participation from stakeholders including citizens and vulnerable groups will be ensured. All efforts will be made to make these plans incorporate resilience to climate induced risks. This intervention will capitalize upon the fact that currently no long term urban development plans are in place either for Nowshera nor for Rawalpindi cities. Further the respective local government acts for Punjab and Khyber Pakhtunkhwa provinces provide for preparation of master plans for urban areas.

[43] Since Rawalpindi and Islamabad has a shared watershed and basin for Lai Nallah, the potential locations for upstream water reservoirs lie in areas that come under the jurisdiction of Capital Development Authority and Islamabad Capital Administration. Likewise the Federal Ministry of Capital Administration and Development also has a stake. Hence their officials will also be made part of project's relevant interventions.

	at the time of implementation of the project	
Output 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans	Not relevant	UNHABITAT will take a lead and develop training and operational manuals based upon project's interventions and learning for the concerned local government officials of Nowshera and Rawalpindi. The training sessions will be delivered by experience trainers while inviting the project's staff to share their experiences with the trainees.
Output 3.1. 100 government official (women men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.	Not relevant	UNHABITAT will take a lead and develop training and operational manuals based upon project's interventions and learning for the concerned local government officials of Punjab and Khyber Pakhtunkhwa. The training sessions will be delivered by experience trainers while inviting the project's staff to share their experiences with the trainees.
Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One set of National guidelines for spatial / urban planning considering climate change / disaster risks developed	- Pakistan Vision 2025 - National Climate Change Policy and Implementation Plan - National Disaster Risk Reduction Policy - National and Provincial Disaster Management Plans - National Water Policy - National Environment Policy - National Sanitation Policy - National Housing Policy - National Building Codes - Work done by Provincial Urban Units - Habitat III -	UNHABITAT along with other project partners will initiate the process for formation of National Urban Policy and strategy as required by New Urban Agenda to which Pakistan is a signatory. Considering the fact that, urban development is a provincial subject in Pakistan and MoCC is the focal agency for Habitat III in Pakistan; the project will organize urban dialogues inviting all the stakeholders. With inputs from these dialogues, consultative meetings will be organized in all the provinces and regions of Pakistan. With inputs from these consultative meetings; UNHABITAT will work with MoCC to draft a National Urban Policy and

		strategy. All efforts will be made to make this policy sensitized to urban resilience. Comments will be invited from all stakeholders including citizens on the draft policy before its presentation to Federal Cabinet for approval.

G. Duplication with other funding sources

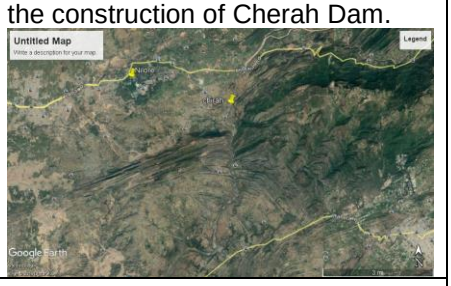
The target areas selected for this project were chosen because of their high vulnerability and inability to adapt to climate change, as well as because the Government of Pakistan has identified as a priority area. However, the target sites are also characterised by minimal other work by development partners in climate change (other donor initiatives were discussed during national and local consultations and are summarised in Section H).

Nevertheless, relevant projects have been identified through the consultation mission and through institutional knowledge of UN-Habitat, thanks to its long history of operations in Pakistan. Table 13 below summarises other relevant projects that are either ongoing, recently completed, or about to start in Pakistan. Historical projects are not included.

Table 13: Relevant projects / programmes, lessons learned and complimentary potential.

Relevant projects/programme, executing entity and budget	Relevant interventions and lessons learned	Complimentary potential and non-duplication
National		
UNDP Adaptation Fund - Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods in Northern Pakistan (US$3.9m) – 2010 – 2015 UNDP Green Climate Fund - Scaling up of Glacial Lake Outburst Flood (GLOF) risk reduction in Northern Pakistan (US$37m)	Focus on addressing GLOF impacts in the north Lessons: use human cantered and livelihood strengthening approach. General approach: 80 percent of flood issues can be addressed through spatial planning and resilient building design / regulations. There is a huge need and scope for water harvesting, also in path of floods	Project is in other target area and focuses on GLOFS. As recommended (through consultation) take approach as recommended
ADB Promoting Urban Climate Change Resilience in Selected Asian Cities: Technical Assistance Report. Pakistan is part of the selection. 2015	Activities and target cities not clear	Coordinate with ADB and government on developing a national urban strategy focused on climate change related risks and impacts
UNDP Water Project Pakistan 2011-2012	Improve the water supply in flood-effected areas in twelve districts all over Pakistan. All in all 200 solar water pumping systems were installed to	Project was in other target areas. PV technique will be considered in feasibility studies.

	provide thousands of families and animals with clean and safe drinking water. Intervention is not very cost-effective.	
Rawalpindi		
UNDP Pakistan Urban Poverty Alleviation Project (UPAP) in Rawalpindi 2007-2008	According to local civil society organizations, the UPAP provided technical and financial support to local organizations for a variety of community based infrastructure development interventions including installation of tube wells, pavement of streets, construction of culverts, widening of drains etc. UNDP stopped it halfway without providing any details regarding the closure of the project	UPAP and REIP also covered some of those areas which are being proposed for this Adaptation Project. Shehersaaz undertook a social audit of REIP and recalls that the project suffered from a variety of issues that contributed in under-performance of the project. Two of the key ones included limited engagement of local government institutions and local civil society groups in the planning and implementation of the project. This project will ensure all stakeholders are well consulted and involved.
Asian Development Bank Technical support and financial assistance for Rawalpindi Environmental Improvement Project (REIP)	One of these was to improve the quantity and quality of drinking water in Rawalpindi City. Like UPAP, REIP was also closed without accomplishing its planned targets.	
Japan International Cooperation Agency (JICA) under a follow-up cooperation worth Rs. 13 million has extended equipment to the Pakistan Meteorological Department (PMD), Islamabad for flood forecasting system of Lai Nullah and Improving the early warning system, deepening of Lai Nallah's bed, construction of embankments etc.	Besides these measures, the local municipal institutionundertake annual cleaning of the Lai especially prior to the monsoon season. These measures do have contributed in lowering the flooding risk as is evident from the testimonies of local residents. However the local administration has not been able to devise sustainable solution to floods and to stop the inflow of untreated domestic sewage and industrial waste water into Lai.	Projects in target areas will be well coordinated with JICA and government bodies.
Government of Pakistan, Ministry of water resources 1229 Construction of Chera Dam, Rawalpindi / Islamabad USD 45 million	UNHABITAT has requested Ministry of Water Resources for provision of this project's details. On receiving these details, the same will be highlighted in the detailed proposal	The project for the construction of the Cherah Dam in Rawalpindi was approved to be constructed on Soan River in 2009 as a joint venture of the Punjab government and the Capital Development Authority, with the former being the executing agency. The construction of the dam was approved by the Executive Committee of the National Economic Council with an estimated cost of Rs5.3 billion and was to be completed by 2013,

		according to its PC-1. The dam was to have a capacity of 15 million gallons a day (MGD), with the water being equally shared by Islamabad and Rawalpindi. However, It is pertinent to mention that so far there is no progress on ground for Chera Dam project as Government of Punjab wants to revise the PC-I and financing plan of the project. The construction of Cherah Dam will have no impact on the proposed AF Project interventions. The proposed location of the Cherah Dam and target areas are in opposite directions. Hence the target area will not be impacted by the construction of Cherah Dam. 
Rawalpindi Water and Sanitation Agency (WASA) is currently implementing the following relevant projects: Lai Nallah Protection, Dredging/Desilting Work (Phase 1) (PKR 197.13 million) Extension of Water Facilities in Extended Controlled Area Recently notified by Punjab Government (PKR 250 million)	UNHABITAT has requested Rawalpindi Water and Sanitation Agency for provision of this project's details. On receiving these details, the same will be highlighted in the detailed proposal	
NUST authoritiesthree small lakes known as NUST Lake for storing rain water by building a small wall. 	These dams collect water from the rain falling within the campus over a small area as catchment area. These lakes are being used as Fish Ponds and as source for charging the ground water level of the Tube Well of the campus. This is a very good example of Water harvesting.	The stream known as Kacha Lei Nala starts from sector H-12 of Islamabad where campus of the National University of Sciences and Technology (NUST) has been constructed. This stream passes right through the campus. Overlap with this intervention will be avoided
World Vision Financial support to communities in Rawalpindi	World Vision could not provide a sustainable solution to address drinking water scarcity crisis in the communities. The project	The project ended and should not focus on pumps for groundwater

for installation of water pumps for extraction of ground water for household consumption.	was not well planned and suffered from a lack of engagement and capacity building of community based organizations. Moreover, groundwater was polluted in some areas	
Nowshera		
Government of Pakistan, Ministry of water resources 1253 Remodeling of Warsak Canal System in Peshawar & Nowshera Districts USD 94 million	UNHABITAT has requested Ministry of Water Resources for provision of this project's details. On receiving these details, the same will be highlighted in the detailed proposal	
International		
UNDP Maldives 2010-2015 USD 9 million Increasing climate resilience through an Integrated Water Resource Management	Output 1.2. focuses on rainwater harvesting schemes redesigned, interconnected and structurally improved to buffer climatic extremes and ensure equal water supply for all households during dry periods	Consult UNDP Maldives to extract lessons and recommendations for this project

No household or community level rainwater harvesting activities have been identified in Nowshera or Rawalpindi cities. Most of the people meet their water needs through extraction of ground water though the quality of groundwater is not fit for human consumption.

H. Learning and knowledge management

It is aimed to ensure project compliance with AF and UN-Habitat standards for Knowledge Management (KM) and advocacy. The strategic framework for the KM, Advocacy & Communication Strategy (KMAS) specific to this project is based on aims, objectives and best practices of both organizations regarding knowledge management (KM), advocacy and communications.

Table 14: key KM Terminology[44]

Knowledge	Is know-how, understanding, experience, insight, intuition and contextualized information
Information	Is contextualized, categorized, calculated and condensed data
Data	Are facts and figures which relay something specific, but which are not organized in any way
Knowledge Management	Is the deliberate and systematic coordination of people, technology, processes and organizational structure to add value through reuse and innovation. This achieved through creating, sharing and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory to foster continued learning
Advocacy	Is set of targeted actions directed at policy and decision makers in support of a

[44]Knowledge Management in the United Nations system. 2016, Joint Inspection Unit. United Nations, Geneva

	specific issue in order to influence decision-making at the local, national and international level to create positive change for people and their environment
Communication	Refers to the specific tools and platforms utilised to efficiently and effectively disseminate knowledge and information so that it reaches target audiences and the public

Throughout this project, a wealth of data, information, and valuable knowledge concerning community vulnerabilities, and especially those of women and youth (in line with the AF gender policy) and resilience to climate change will be generated at the community and city levels. To ensure that useful lessons and experiences gained are successfully captured, retained, utilized, and shared throughout the project, a clear KM, Advocacy & Communication Strategy (KMAS) accompanying actionable work plan will be formulated as a point of reference for all project staff and implementing partners. Adhering to this strategic framework and work plan will facilitate the effective coordination of resources and efforts at all stages of the project implementation, monitoring, and evaluation.

Knowledge Management at project level is achieved through the development of appropriate actions (gathering data; analysing processes, results, and personal experiences; generating and disseminating knowledge products and lessons learned, etc.) so that the knowledge captured and generated at the individual and project level is systematized and shared to reach the largest number of beneficiaries as quickly as possible.

A strong and actionable work plan allows effective knowledge sharing, advocacy and communications. Once knowledge products and lessons learned have been generated and developed, it is necessary to effectively communicate and share these with specific target groups and audiences as well as the public.

The core benefits of a successful KMAS within this project are outlined below:

- ☐ Improves visibility of project activities and results to raise awareness on climate change impacts and adaptation at multiple levels and especially for women and youth
- ☐ Enhances capacity for knowledge retention and reuse (at community, national and international level, including specific focus on women and youth)
- ☐ Enhances knowledge sharing and increases collaboration (within and across communities, relevant institutions, and organisations, including specific focus on women and youth)
- ☐ Improves learning (organisationally, locally, and globally)
- ☐ Strengthens accountability vis-à-vis project delivery and compliance with environmental, social, gender, youth, and human rights standards.
- ☐ Increases project impact through learning and access to information, including specific focus on women and youth
- ☐ Avoids duplication
- ☐ Facilitates modification of current and future projects based on lessons learned
- ☐ Strengthens stakeholder/knowledge networks, including specific focus on women and youth
- ☐ Contributes to normative work of the Government of Pakistan, provincial governments, and other stakeholders, and of the Adaptation Fund & UN-Habitat.

Implementation of KMAS is within each component and activities of this project to capture and share lessons.

The planned activities under component 1 will provide communities and households and especially women, with a better understanding / knowledge of how to construct, use and

maintain flood resilient water harvesting systems, using innovative techniques. Participatory approach (involving communities in planning and implementation activities) will lead to increased local knowledge on climate change adaptation, especially related to urban floods and water scarcity issues. Educational and information material will be produced for community awareness and advocacy and will be used from the inception of community engagement. This contributes to better understand the climate related issues and best possible solutions that communities can adapt. The project will also use a participatory monitoring process, which will enable the beneficiary communities to work directly with the project's M&E officer, to highlight issues in delivery and to strengthen adaptation benefits, including in replication and sustaining the project's gains. Knowledge products will be developed for replication purposes in other communities.

The planned activities under component 2 aim at producing the same knowledge but then for government and city officials. Raising awareness of city/ district officials involved on issues related to community resilience, community actions and partnership approach etc., can generate greater commitment and support for addressing issues. Moreover, capacities for developing pro-active spatial plans considering flood and drought risks, will be strengthened. Such engagement of awareness raising will also pave the way for policy review to ensure the project's sustainability and the development of a conducive policy environment. All relevant information should be fed back to the provincial and national governments when appropriate.

As for the planned activities under component 3, this is a strong knowledge production component focused on developing national policy and technical guidelines. This will address the technical capacity gaps in spatial planning and regulatory frameworks related to infrastructure development and urban development considering climate change risks and impacts.

Visibility of project activities including lessons will be communicated (As a UN protocol of Pakistan's One UN System) using press releases and media events through UN Information Center (UNIC) of Pakistan and they shall disseminate the same with the other UN agencies, also the human-interest stories will be published in the UNIC run newsletters. The details of the project shall be projected on the country website and the social media campaigns.

At the regional level, the lessons, tools, methodologies and guidelines from the project will be consolidated and added to the regional knowledge database and shared with the Regional Climate Change focal point/team and other country offices through the Knowledge Management focal point within the UN-Habitat Regional office for Asia and the Pacific. Regional knowledge platforms, such as Asia Pacific Expert Group Meeting, Asia City Summit are other openings for dissemination of KPs.

At the international level, the lessons from the project will be shared with the UN-Habitat best practices unit within HQ through the Knowledge Management focal point for dissemination to all countries; and similarly, through the Regional Climate Change focal point/team with the Climate Change Planning Unit within the Urban Planning and Design Branch for consolidation of all knowledge products related to Climate Change. Thematic networking sessions and events in global events such as World Urban Forum will be targeted.

A specific approach to women and youth includes the following (see outcomes consultations Part II.H):

- ☐ Reading material and videos targeting women and youth will be prepared in local languages

- ☐ Ensure that women are being visibly engaged as agents of change at all levels of disaster preparedness, including education, communication, information and networking opportunities.
- ☐ Build the capacities of national and local women's groups' and provide them with a platform to be heard and to lead.

Table 15: learning objectives and knowledge products per output

Expected concrete output/intervention	Learning objectives (lo) & indicators (i)	Knowledge products
Output 1.1. (concrete) 5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	(lo): involving community members and especially women and youth in construction and maintenance of facilities (i) number of community members involved	See below
Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate water harvesting facilities at community level, and to reduce waste in drainage channels through awareness raising campaigns	(lo): community members have the technical capacity to operate and maintain water harvesting facilities (i) Trainings conducted and people attending them	Eight plans developed Technical manuals produced Video's produced
Output 2.1. (concrete) 40 district / city-level water harvesting facilities constructed (or smaller number if possible)	(lo): involve district and city officers in planning and design of facilities (i) number of district and city officers involved	See below
Output 2.2. Two district / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans. These strategies are decision-making tools for cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors	(lo): District and city government have capacity to plan, construct, maintain and replicate best practice water harvesting facility (i): Manual published online and shared nationally through workshop	Spatial strategies developed: These strategies are decision-making tools for cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors. Manual to plan, construct, maintain and replicate best practice

Output 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans		water harvesting facility as part of spatial planning strategies
Output 3.1. 100 government official (women men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.	(lo): Concerned government officers have capacity to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools. (i): Manual published online and shared nationally through workshop	Manual for guiding / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.
Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One set of National guidelines for spatial / urban planning considering climate change / disaster risks developed	(lo): Concerned government officers have capacity to guide / direct urban development considering climate change and disaster risks and impacts (i): National strategies and guidelines developed	National urban strategy / plan focused on climate change / disaster risk reduction developed National guidelines for spatial / urban planning considering climate change / disaster risks developed

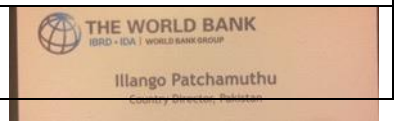
Capturing lessons learned will be throughout the life of the project at multiple levels. Knowledge capturing will be centred on the case studies, beneficiary satisfactory surveys, stakeholder feedback sessions, research and issue papers and policy briefs. Good practices and key lessons learned of the project will be shared locally and nationally for policy dialogues. Knowledge products are shared nationally regionally and internationally at meetings, workshops, conferences and global knowledge networking events such as the World Urban Forum.

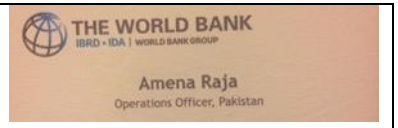
I. Consultative process

The project has been designed based on the outcomes of consultations at the national-, district-, city- and community level. Consultations with UN agencies, NGO's, etc. took place to understand climate change impacts in Pakistan, to identify potential focus and target areas and to identify potential risks for vulnerable groups and compliance to human rights, Labour standards, etc. At the national, district- and city-level, consultations further focused on ensuring that the project aligns with national and sub-national priorities. At the community level, consultations focused on understanding local climate change impacts and effects, barriers to adapt and possible interventions to address negative impacts. Consultations with community representatives and women took place to identify specific impacts and needs and to develop specific groups baselines and approaches to ensure equal distribution of benefits (see annex 2). Below table provides an overview of stakeholders consulted, consultation objectives, outcomes, conclusions and consultation evidence. During the full proposal phase, consultations will focus on fully identifying sub-projects and to identify all associated potential environmental and social risks and impacts through community consultations. For detailed surveys and attendance sheets, see annex 1.

Table 16: Initial consultation outcomes and conclusions

Stakeholder, incl. role/function	Objective	Outcome	Conclusion	Evidence
Mr. Khizar Hayat Khan Federal Secretary Ministry of Climate Change (MOCC)	- Align proposed project with national priorities	- Very welcoming to a project that addresses water scarcity (new priority) and flooding	- Focus on water scarcity and flood issues	 Date: 04-06-2018 Method: interview / discussion
Mr Irfan Tariq DG and AF focal point Ministry of Climate Change	- Align proposed project with national priorities - Agree on way forward	- Priority issues: water scarcity (new priority) and flooding - Name of ministry will be changed to climate change and human settlements – so more urban focus - Request to develop a national urban policy - Priority town: Nowshera - Also, water scarcity issue in Islamabad and Rawalpindi – technique needed to conserve / harvest water + urban planning	- Focus on water scarcity and flood issues - National urban policy and urban planning strategies to reduce climate change impacts (floods and droughts) part of project - Focus on Nowshera if feasible. Consider Islamabad and Rawalpindi if vulnerable area	 Date: 04-06-2018 Method: interview / discussion
Lt. Gen Omar Mahmood Hayat Chairman National Disaster Management Authority MOCC	- Align proposed project with national priorities - Understand main disaster /	- Cities are not planned for floods and water - Land use plans and building codes needed to avoid people moving into risk areas and building codes to construct	- Include land use planning strategy and resilient building codes components in the project	

Fiaz Hussain Shah Director General National Institute of Disaster Management MOCC	cc issues	resilient houses - Suggested to focus more south compared to donor focus on tribal / northern areas		Date: 04-06-2018 Method: interview / discussion
Ms. Ingrid Christensen Country head ILO **Abid Niaz Khan** National programme coordinator	- Identify main potential risks / issues to comply to ILO standards - Understand main labour-related needs	- Ensure safety and health (155 and 187) are guaranteed during activities, especially for women - Suggest promoting decent work / livelihood options (skills, protection, diversification) and build upon existing skills - Ensure maintenance arrangements are institutionalised – work with provincial / district irrigation departments	- Ensure safety and health (155 and 187) are guaranteed during activities, especially for women - Consider skill development, e.g. for resilient house design, in project - Work with provincial / district irrigation departments	 Date: 04-06-2018 Method: interview / discussion
Mr. Shakeel Ahmad Chief Development unit UNDP **Amanullah Khan** Chief Environment and climate change UNDP	- Understand main disaster / cc issues - Map lessons learned other projects	- In process of developing community of practice focused on 'urban' - One relevant rural water harvesting project - One relevant flood project focused on livelihood recovery + AF and GCF GLOF projects - Lessons: use human center and livelihood strengthening approach - General approach: 80 percent of flood issues can be addressed through spatial planning and resilient building design / regulations - There is a huge need and scope for water harvesting, also in path of floods	- Use lessons from projects - Include spatial planning, building design / regulations and water harvesting components in the project	 Date: 04-06-2018 Method: interview / discussion
Mr. Illango Pathchamuthu Country director	- Understand main disaster /	- Need of land use planning and building codes, especially in	- Include land use planning and building codes	

World Bank **Amena Raja** Operations officer World bank	cc issues - Map lessons learned other projects	Punjab - Need to address issue of water scarcity in Karachi (due to salt water) - Use lessons from some 2-3 relevant flood-related projects	component in project - Use lessons learned from flood-related projectt	 Date: 05-06-2018 Method: interview / discussion
Mr. Ahmed Kamal Chief Engineering Advisor & Chairman Federal Flood Commission Ministry of Water Resources	- Align proposed project with national priorities - Understand main disaster / cc issues	- Most relevant policies / plans: National flood protection plan and National water policy – priorities are water scarcity and floods - ADB, JICA and WWF (GCF) interested in flood plan - Suggest combining local water harvesting knowledge / techniques with world and regional best practices to improve system and clean water - Suggest developing a city water management model and to raise public awareness about water scarcity / conservation needs - Co-funding from government is option	- Fully align with National flood protection plan and National water policy - Avoid overlap with ADB and JICA projects - Focus on combining local water harvesting knowledge / techniques with world and regional best practices to improve system and clean water - Consider developing a city water management model – perhaps as part of national urban policy - Explore options of co-funding from government	 Date: 05-06-2018 Method: interview / discussion
Ms. Fareeha Ummar Progamme specialist UN Women	- Identify main potential gender related risks - Understand main gender needs in Pakistan	- Legal status: consider potential risk of 'violence against women (domestic) and harassment. - Religious / cultural status: misinterpretation but often dependent on men (also in decision-making), which can be a problem with e.g. rescue work, especially when women are not registered – key challenges: mobility, social norms and	- Ensure safety and health are guaranteed during activities - Include women in decision-making processes, where possible - Focus on women with water-related activities – also with skills and capacity focus - Work with national	

		mindsets - Women are generally water 'handlers' - Suggest working with national commission 'status of women' and gender focal points within NDMA and departments - Suggest focussing on skills + capacity development	commission 'status of women' and gender focal points within NDMA and departments - Consider working with Lahore women university	Date: 05-06-2018 Method: interview / discussion
Mr. Hussain Ullah Head of preparedness unit OCHA	- Identify main potential human right risks - Understand main issues and needs when it comes to disaster preparedness and response	- Main issue: water scarcity – there is no proper water and floods management system and the most vulnerable are hit hardest - Punjab has good data - Sindh has a governance gap - Balochistan has some good water scarcity coping strategies – but question is how to purify water - Suggest to carefully study landscape requirements for water harvesting - NDMA has good report identifying most hazard impacts vulnerable areas	- Focus on water scarcity issue - Identify areas appropriate for water harvesting (with slope) - Use NDMA data to identify target area with above	 Date: 05-06-2018 Method: interview / discussion
Ms. Almas Saleem Executive director SheherSaaz NGO **Abdul Shakoor Sindhu** Chief Technical Advisor SheherSaaz NGO	- Identify main urban climate change and disaster issues - Identify potential target areas based on assessments - Discuss cooperation options	- Main issues floods and water scarcity - Suggest focussing on Nowshera and Rawalpindi as both (flash) floods and water scarcity are issues - SheherSaaz in only NGO in Pakistan that focuses on urban issues in a comprehensive way - Agreement on cooperation on consultations	- Assess Nowshera and Rawalpindi as best target areas - Work together on consultations	 Date: 06-06-2018 Method: interview / discussion

Initial local government and community representatives' consultation Nowshera	- Understand main climate change related impacts and specific effects and barriers to adapt - Identify main issues and needs - Understand main concerns - Identify targets communities - Identify possible interventions	- Concerns of the poor don't reach the government - Impact: 2-meter flood (river -north side - and flash – from mountains 10 km away – south side) leading to death and destruction - Most difficult to adapt / recover: business, contaminated water, unhygienic situation - Priorities / needs regarding floods: 1) safety, 2) water (contamination) and food, 3) housing, crops, cattle (destroyed) - Water source: wells - Need to build water reservoir dams and; need of rescue kits during floods and shelter after floods; need of gender approach (health, hygiene); need of training of carpenters, electricians, etc. - Most affected communities:	- Consider inputs in project design.	  Date: 06-06-2018 Method: group discussion

Initial local government and community representatives' consultation Rawalpindi union council 4-5-6	- Understand main climate change related impacts and specific effects and barriers to adapt - Identify main issues and needs - Understand main concerns - Identify targets communities - Identify possible interventions	- Impact: floods up to 1st floor (4 meters) in very dense area leading to death, destruction, diseases, electricity power cut (also outside flood period), etc. + water scarcity due to drought and contaminated water (year-round) due to floods - Most difficult to adapt / recover: contaminated water (using boreholes – there is a lot of waste. - Priorities / needs regarding floods: 1) safety (especially children falling and in and elderly, 2) water (contamination) - Need to reduce flood water from source (as very dense area; need clean water year-round in communities; - Most affected communities: union councils 4-8 + further along the channels (10 km)	- Consider inputs in project design.	   Date: 07-06-2018 Method: group discussion
Mr Irfan Tariq DG and AF focal point Ministry of Climate Change With representatives from SheherSaaz	- Agree on main approach, components and target areas - Agree on steps / way forward	- Agreement on main approach and components – will review document - Agreement on main steps / way forward – will send letters to target municipalities to get their official buy-in - Include Islamabad by-law on water harvesting in building	- See left	 Date: 08-06-2018 Method: interview / discussion

		design in project design		
Rawalpindi community consultations Rawalpindi union council Union Councils 4-5-6	- Understand climate change related issues and needs in target areas	- Flooding, diseases and droughts / water scarcity are all getting a lot worse and water scarcity is the most pressing issue Water scarcity specific issues: - The poor households are most affected, as they cannot afford to bear the cost of installing a borehole and neither can pay for availing the facility from private water vendors - Getting water for poor households make up more than half of the community cost them socially as well as economically. In these households, collection of water largely rests with women and children. Sometimes they have to spend hours in this activity and hence to compromise their time which they can otherwise use for leisure or productive activities--education and employment. - Scarcity of water is also a source of feuds among neighbors. Diseases specific issues: - Contaminated water is a source of number of water borne diseases including diarrhea, gastro and hepatitis to name a few. Flood specific issues: - Floods are recurrent phenomenon thanks to the close proximity of Lai Nallah and presence of some natural drains. - Absence of land use planning and control has also contributed in localized flooding. The natural drainage channels as well as Lai Nallah have been encroached leading to narrowing of their traditional right of ways. Barriers for adaptation: - Dependence on (polluted) groundwater of which the water table has gone down dramatically - Absence of water sector planning at various levels and lack of awareness and technical support. - People do not have a control on quality of water being supplied through municipal authorities as well as water vendors	 Date: 04-07-2018 Method: discussion and survey (see annex 1)

		- Lack of waste management leading to more flood risks and groundwater pollution		
UN gender working group UNIC UNIDO UNDP UNDSS UN-Habitat Shehersaaz	- Understand main gender specific related issues and needs regarding climate change, also in target areas	Identified Challenges for women to adapt to climate change vulnerabilities - Women are typically absent from the forum where Disaster Risk Reduction (DRR) decisions/ planning is made, so when priorities are established, the interests of women are often poorly represented. - Women are often absent from trainings for disaster management. - Difficulties in finding adequate shelter, food, safe water, and fuel for cooking, as well as problems in maintaining personal hygiene and sanitation, prevent women from performing their usual roles at home in disaster situations. - Women also suffered from water crises due to the scarcity of clean drinking water. The majority of the women faced drinking water problem and communication problem due to damaged roads, culverts, and embankments. - Mobility problems during floods	Measures Proposed for strengthening adaptive capacity of women - Make them part of Awareness campaigns - Prepare reading material and videos for them in local languages - Train women to use technologies for water harvesting - Ensure that women are being visibly engaged as agents of change at all levels of disaster preparedness, including in early warning systems, education, communication, information and networking opportunities. - Improve the knowledge, skills and behaviours of vulnerable women for a good quality warning, evacuation, shelter and rehabilitation mechanism. - Build the capacities of	  Date: 31-07-2018 Method: discussion

		- There exists no mechanism to communicate with women groups	national and local women's groups' and provide them with a platform to be heard and to lead - Development of a women volunteers team within each community to address women and girls special needs - Mainstreaming gender into policy processes, programmes and projects can help ensure that such processes equitably benefit women and men while allowing optimal use of the unique knowledge and skills of women and men. By the same token, gender mainstreaming can advance social policy (including gender equality) while ensuring greater returns on adaptation and disaster risk reduction investments. - Consider the level of women's access to technology and finances, health care, support services, shelter and security in times of disaster.	

Rawalpindi women consultations Rawalpindi union council Union Councils 4-5-6	- Understand main gender specific related issues and needs regarding climate change in target communities	- Flooding, diseases and droughts / water scarcity are all getting a lot worse Flood specific issues: - Women being responsible for housekeeping put a lot of effort and time in cleaning their houses whenever they are affected by floodwaters. - The monsoon season brings fear and especially women have to stay extra conscious spending sleepless nights. Disease specific issues: - The prevalence of water borne disease and epidemics especially affects younger children. Taking care of them primarily comes to women increasing their burden and affecting their productive time. Disability among children is especially high. Water scarcity specific issues: - Women have to travel almost two kilometers to bring drinking water from two nearby water sources--private boreholes. Barriers for adaptation: - Women are not involved in any community-based decision making. - Poverty is rampant. Men resort to daily wage labor while women contribute in household incomes by working as domestic servants or undertaking works like sewing/tailoring in their homes. - Most of the households are poor and disease burden is high. No social safety nets or subsidized healthcare facilities are available to households. - Most of the households are poor. The meager earnings do not afford them the opportunity to invest in water filtration or other effective measures for having clean water for household uses. - Generally, households do not have knowledge of household level low cost but effective water purification technologies. Concerns: - They fear that flood protection measures involving removal of encroachments from Lai Nallah's banks may lead to their displacement. - Locality/neighborhood is densely populated having little space for water collection ponds. They were also of the view that since they were tenants and poor they would not be able to invest in household level rainwater harvesting technology.	 Date: 01-08-2018 Method: discussion and survey (see annex 1)

		Women skills, strengths and leaders - The sense of togetherness can be transformed into effective women / community organization and can be encouraged to undertake community driven or community led initiatives.	
Nowshera community consultations Nowshera Kalan	Understand climate change related issues and needs in target areas	- Flooding, diseases and droughts / water scarcity are all getting a lot worse and water scarcity is the most pressing issue Water scarcity specific issues: - The available water from municipal supplies stinks and is highly contaminated. - The ground water up to the depth of 100 ft is not fit for human consumption. - The poor households not being able to afford water purification / filtration systems are compelled to consume contaminated water - Flood specific issues: - Over the years, the haphazard and unplanned growth of the city resulted in encroachment of river banks. Whenever river overflows the surrounding localities are inundated. - Besides River Kabul a number of natural water channels that drain into River Kabul also pass through the city. During rainy season, these channels also cause flooding inundating neighboring areas. Disease specific issues: - Contaminated water is a source of number of water borne diseases including diarrhea, gastro and hepatitis to name a few. Barriers for adaptation: - Especially poor and lower middle income households can't afford to Install boreholes to extract groundwater from safer depths - Households generally are not aware of household level low cost water treatment technologies - The communities are not familiar with community-based flood management measures. - The river and the water channels have been turned into dumping points for city's solid waste.	 Date: 01-08-2018 Method: discussion and survey (see annex 1)
Mohammad Shakeel Malik Federal Secretary Ministry of Climate	- Get feedback on the proposal before final	- Include water purification and waste management approach in the proposal	Date: 06-08-2018 Method: discussion

Change (MOCC)	endorsement		

J. Justification

The proposed project components, outcomes and outputs fully align with 1) national and local government / institutional priorities and gaps identified, with 2) identified community and vulnerable groups needs and 3) with the Adaptation Fund outcomes. This alignment has resulted in the design of a comprehensive approach in which the different components strengthen each other and in which outputs and activities are expected to fill identified gaps of Pakistan's' and target cities' current climate change response and corresponding institutional capacities. In fact, the selected interventions / activities are directly confirmed and / or proposed by the national, state and municipal governments and inhabitants of target communities through consultations, as reported in Part II.H above.

The project aims to maximizing the funding amount for concrete adaptation interventions: see outputs 1.1. and 2.1.; funding allocation to the other outputs is required to support the execution of these concrete interventions in a sustainable way as well as to respond to government priorities / requests. The table below provides a justification for funding requested, focusing on the full cost of adaptation reasoning, by showing the impact of AF funding compared to no funding (baseline) related to expected project outcomes.

While Pakistan stands among the list of those countries which are most vulnerable to impacts of climate change, the national level efforts are not at par with the adaptation requirements of the country. In 20112-13 the National Climate Change Policy was introduced followed by a Climate Change Act 2016-17. However, the mainstream or integration of climate change adaptation and mitigation in planning and development has still to go a very long way. The AF Funds are required to catalyse this process. These funds will be used not only to address the urban climate change vulnerability by offering practical technologies and solutions at community and city scale, but also to catalyze the spatial planning practices and urban development policies and strategies in a climate sensitive manner. The project outcomes will provide an opportunity for the Ministry of Climate Change to demonstrate practical, sustainable solutions which can be replicate through incorporating such proposals to the ministerial fund-raising tool from Planning Commission (PC1). This has been discussed during the consultation held by UN Habitat recently.

Target communities / households have little support from municipalities to address flood and drought / water scarcity issues, mainly due to the informal status of the communities (i.e. no basic services), high poverty incidences and lack of resources and capacities. Boreholes have been dug by community members themselves but these are now a lost investment because of groundwater depletion and contamination. Therefore, to address drought / water scarcity issues affecting the vulnerable target community / households, funding of innovative rainwater harvesting systems is needed. To reduce flood impacts in the same areas, up-stream water harvesting options that also reduce down-stream floods are needed. These will be planned through spatial strategies that look beyond city boundaries and basic sectors.

Table 17: Overview of impact of AF funding compared to no funding (baseline) related to expected project outcomes

Expected concrete output/intervention	Baseline (without AF)	Additional (with AF)	Comment and alternative adaptation scenario's
Output 1.1. (concrete) 5000 community / household level flood resilient i.e. elevated to not be affected by flood water) rainharvesting facilities constructed, using innovative techniques Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate rainwater harvesting facilities at community level, and to reduce waste in drainage channels through awareness raising campaigns	Communities in target cities don't have the capacity to plan, operate and maintain community and household-level water harvesting facilities, which are urgently needed to respond to clean water needs.	The proposed activities / interventions under component 1 will allow communities, and especially women and youth in target cities to plan, operate and maintain community and household-level water harvesting facilities, which are urgently needed to respond to drought / clean water needs.	Alternative adaptation scenarios are the enhancement of boreholes or piped water. However, water from boreholes could get contaminated by flood water and piped water could also be at risk because of high flood levels.
Output 2.1. (concrete) 40 district / city-level water harvesting facilities constructed (or smaller number if possible) Output 2.2. Two district city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans. These strategies are decision-making tools for	District and city government officials in target cities don't have the capacity to plan, operate and maintain water harvesting facilities, taking into account flood and drought risks through spatial planning strategies, which is urgently needed to respond to climate change flood and drought risks	The proposed activities / interventions under component 2 will allow city government officials to plan, operate and maintain water harvesting facilities, taking into account flood and drought risks through spatial planning strategies / decision-making	Alternative adaptation scenarios are resettlement or the construction of larger drainage channels, which are not feasible from a cost perspective and environmental and social risks point of view and will also not have the benefit of water supply. Due to the severe historical flood impacts, community-level flood reduction

cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors Output 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and houses and to develop spatial plans			interventions won't reduce flood impacts enough.
Output 3.1. 100 government officials (women and men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools. Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One set of National guidelines for spatial / urban planning considering climate change / disaster risks developed	There is no national strategy to deal with urban areas, especially taking into account climate change risks and impacts. Although spatial planning strategies are an effective tool to avoid people moving into high flood risk areas, national strategies focused on this are lacking.	The proposed activities / interventions under component 3 will allow the national government to guide / direct urban development considering climate change and disaster risks and impacts through different strategies	Alternative adaptation scenarios are a focus on the development of sub-national strategies, but this will reduce the complete government buy-in, including budgets.

K. Sustainability

The project aims to sustain adaptation benefits achieved and replicate best practices (i.e. lessons) after the end of the project through a combination of anchoring activities into existing government programmes and strategies and community plans, including for infrastructure operation and maintenance and by sharing lessons and best practices (see part II.G).

Institutional sustainability

The project will pave the way for the national government and local authorities to sustain and up-scale the project to other districts and cities by developing relevant national strategies, which have been requested by the government and which will be anchored into existing ministry and

municipal programmes. As per LOA/MOA, the Beneficiary Community or Govt. Department will be responsible for the Operation and Maintenance of Infrastructure and Technology.

Moreover, trainings will be conducted to strengthen relevant government capacities and best practices and lessons learned from all component outputs and outcomes will be shared at the national and sub-national level.

Social sustainability
By organizing and fully engaging community members and vulnerable groups in project activities, including assessments during project preparation and the development of plans/ strategies and monitoring, the project aims to achieve long-lasting awareness and capacities of community members. Moreover, communities will develop plans and community members will be trained to operate and maintain assets developed. Possible social risks and impacts will also be identified and assessed in detail and if needed, mitigation, during the full proposal development phase.

Economic sustainability
Investing in increasing the resilience of vulnerable assets is a sustainable economic approach. It will avoid future costs related to drought and flood impacts. The national strategies, as well as community plans will consider economic opportunities.

Environmental Sustainability
The national strategies, as well as community plans will also consider environmental impacts. Possible environmental risks and impacts will also be identified and assessed in detail and if needed, mitigation, during the full proposal development phase.

Financial sustainability
The proposed interventions are fully aligned with national and sub-national priorities and programmes and therefore, the government actively supports the project and interventions, including anchoring it to existing programmes.

Technical sustainability
The water harvesting facilities will be designed and constructed using resilience and building back better principles. This will enhance the durability/sustainability significantly. Besides that, a feasibility study and environmental and social impact assessment will be conducted for the planned facilities during the full project development phase and formal partnerships with target municipalities will be established for the maintenance of facilities.

A Settlement WASH Committee (SWC) will be formulated is an inclusive group of elected community members from the rainwater harvesting households to a) monitor the usage of rain water facilities in their settlements, b) discuss WASH development issues faced by the entire community c) seek support from city authorities. SWCs, as they are elected directly by the people are answerable and accountable to the people who elected them. Through tools like mass meeting and social audit business plans for maintenance and replacements of systems, representatives keep communities informed about the implementation of their decisions and status of resource utilization. SWCs will be registered with city authorities to create institutional linkages, make rainwater harvesting as a part of city water supply programme. It is encouraged women participation in SWCs. Community training will be provided to SWCs and operations manual for SWC will be developed and orientation will provided. Moreover, A community-based model for managing and maintaining household-level rainwater harvesting facilities is proposed:

women and youth groups will management and maintain these facilities. Therefore, trainings will focus on these groups.

Below table provides an overview of project outputs and arrangements to sustain / maintain these. Details for the arrangements will be identified during the full project development phase through consultations with DG, MOCC and Chairman Federal Flood Commission, concerned disaster management authorities, local municipal institutions in Rawalpindi and Nowshera and local civil society groups and communities.

Table 18: overview of outputs and arrangements to sustain / maintain these

Expected concrete output/intervention	Arrangements to sustain / maintain activities / interventions
Output 1.1. (concrete) 5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	Development of community plans for operation and maintenance and agreement established between communities and municipal government about maintenance arrangement and built community-based skills on operation and maintenance. Guidelines/operational manual on the use and maintained of Rainwater Harvesting Systems will be developed in local languages
Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate water harvesting facilities at community level, and to reduce waste in drainage channels through awareness raising campaigns	
Output 2.1. (concrete) 40 district / city-level water harvesting facilities constructed (or smaller number if possible)	As per LOA/MOA, the Beneficiary Community or Govt. Department will be responsible for the Operation and Maintenance of Infrastructure and Technology. Exact responsibilities and arrangements will be identified and agreed upon during the full proposal development phase
Output 2.2. Two district / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans. These strategies are decision-making tools for cities to manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors	Formally approve the plans as part of district / city development plans. During the preparation greater involvement of planning bodies (units) expected and promoted to enhance sense of ownership
Output 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans	Guide developed and widely used tools localized/updated to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to develop spatial plans
Output 3.1. 100 government officials (women men) trained to guide / direct urban development considering	

climate change and disaster risks and impacts, using especially spatial planning tools.	
Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One National guidelines for spatial / urban planning considering climate change / disaster risks developed	Guidelines for spatial / urban planning considering climate change / disaster risks developed using internationally accepted tools and guidelines such as International Guidelines on Urban and Territorial Planning.

L. Environmental and social impacts and risks

The proposed project seeks to fully align with the Adaptation Fund's Environmental and Social Policy (ESP) and the Gender Policy (GP). Further to part II.E above on project compliance with national technical standards, outlined below is a summary of the findings of the initial (concept note stage) screening of all components and activities / interventions against the 15 AF principles to identify potential environmental and social risks and impacts. With this information, the entire project risk has been categorized.

Because of the nature of the proposed interventions (water harvesting facilities under output 2.1), the entire project is currently categorized as a medium risk (Category B) project. The proposed water harvesting facilities are concrete intervention with possible adverse environmental and social impacts. Specific concerns are related to equal access to water, informal use of construction sites and negative impact on natural habitats, biodiversity and land and soil. During the full project development phase, when detailed information of the location and design will be made available an environmental and social impact assessment will be conducted in line with national technical standards, which will provide information for a more accurate categorization. As for the activities under the other outputs, potential risks concerns are related to equal access to benefits and avoidance of adverse impacts on marginalized and vulnerable groups and women, but these risks will be mitigated.

During the full proposal development phase, detailed screening of all components and activities / interventions against the 15 AF principles will take place to identify all potential environmental and social risks, assess impacts in detail and propose mitigation measures when needed. This will be done by collecting detailed information on proposed activities /interventions, conduct feasibility studies of concrete interventions and assess environmental and social impacts of potential risks, all through studies in line with national technical standards and community and vulnerable groups consultations.

A 'gender' baseline and approach / strategy is under development (see annex 2) to reduce potential risks and maximize benefits for marginalized and vulnerable groups, including women, youth, elderly and disabled and to ensure that project benefits will be allocated equally, that discrimination nor favouritism in accessing project benefits can take place and that adverse impacts are avoided. Besides that, potential environmental and social risks and impacts are assessed in more detail in the ESP compliance annex (annex 2).

Below table provides an overview of the 15 AF principles and a checklist if further assessment is required during the full project development phase. In the ESP compliance annex 1, screening outcomes of all project activities / interventions against the 15 AF principles are discussed in detail.

Table 19: checklist of the 15 AF principles:

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	x	
Access and Equity		x
Marginalized and Vulnerable Groups	x	
Human Rights	x	
Gender Equity and Women's Empowerment	x	
Core Labour Rights	x	
Indigenous Peoples	x	
Involuntary Resettlement	x	
Protection of Natural Habitats		x
Conservation of Biological Diversity		x
Climate Change		x
Pollution Prevention and Resource Efficiency	x	
Public Health	x	
Physical and Cultural Heritage	x	
Lands and Soil Conservation		x

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

A. Record of endorsement on behalf of the government[45]

Muhammad Irfan Tariq, Directlor General, Minsitry of Climate Change, Government of Pakistan	Date*: August 6, 2018*
Ahmad Kamal, Chief engineer advisor / chairman FFC/CE(DSC), Ministry of Water Resources, Government of Pakistan	Date: August 1, 2018

Tele # 9245528
Fax # 9245533

D.O.No. 6(2)/2006-Arch.
Government of Pakistan
Ministry of Climate Change
LG & RD Building
****

Islamabad the 6th August, 2018

SUBJECT: LETTER OF ENDORSEMENT FOR ADAPTATION FUND ON URBAN WATER HARVESTING AND FLOOD MANAGEMENT NEXUS IN NOWSHERA AND RAWALPINDI

I am pleased to endorse UN Habitat Project Programme Proposal on "Urban Water Harvesting and Flood Management Nexus In Nowshera And Rawalpindi" for adaptation fund in my capacity as National Focal Point for Pakistan Adaptation Fund.

(Muhammad Irfan Tariq)
Director General (Env & CC)

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, DC., 20433
USA

6. 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.

CEA/CFFC
Tel: 051-9244600
051-9244604

No. FC-1(2)CEA/CFFC-UN-Habitat/2018
Government of Pakistan
Ministry of Water Resources
Office of Chief Engineering Adviser/Chairman, FFC
6-Attaturk Avenue, G-5/1, Islamabad

Islamabad, Pakistan, the Ist August , 2018

Subject: SUPPORT FOR THE PROJECT: 'URBAN WATER HARVESTING AND FLOOD MANAGEMENT NEXUS IN RAWALPINDI AND NOWSHERA'

This is with reference to a Concept Proposal received from UN Habitat, Pakistan Office dated July 31, 2018 on the subject matter.

The Federal Flood Commission, Government of Pakistan, is pleased to support the project "Urban Water Harvesting and Flood Management nexus in Nowshera and Rawalpindi" prepared by UN Habitat Pakistan, as the project is aligned with the objectives and expected benefits as envisaged in the approved National Flood Protection Pan-IV (NFPP-IV).

Accordingly, FFC is pleased to endorse the above project proposal with support from the Adaptation Fund.

Yours sincerely,

Ahmed Kamal
Chief Engg Advisor/Chairman FFC/CE(DSC)

To:

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

B. **Implementing Entity certification**

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, including the Pakistan NDC, Pakistan 2015, the National water policy and the and National flood protection plan, subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.
for Rafael Tuts Director, Programme Division UN-Habitat  Signature
Date: 06-August-2018 | Tel. and email: +25420762-3726 raf.tuts@un.org
Project Contact Person: Laxman Perera
Tel. And Email: +81927247121 Laxman.perera@un.org

ANNEX 1: Detailed consultations reporting / evidence

Content:

- ☐ Rawalpindi community consultations
- ☐ Rawalpindi women focus group discussions
- ☐ Nowshera community consultations
- ☐ Rawalpindi women focus group discussions (to be included in full proposal)

Rawalpindi community consultations

RAPID COMMUNITY SURVEY
BUILDING URBAN CLIMATE RESILIENCE IN PAKISTAN
UN-HABITAT - ADAPTATION FUND
Focus: community level – union councils (most vulnerable communities in target areas)
Method: group discussion

Note: focus group discussionswere done with representatives of three union councils (UCs) in Rawalpindi City. The names of UCs are: Dhok Mangtaal (UC # 4); Dhok Hassu North (UC # 5); and Dhok Hassu South (UC # 6). Although the National Population and Housing Census was conducted in late 2017 in Pakistan; Pakistan Bureau of Statistics (PBS) has only released the preliminary census result and has yet to release the detailed disaggregated demographic figures. The recent UC wise detailed census data is yet not available. To compensate this deficiency, we have referred to the population estimates made by Government of Punjab's Planning and Development Department (P&DD). According to P&DD) on 31 Dec 2016, the mentioned Union Councils had following estimated population figures:

Name of Community/Area	Estimated Population on 31 Dec 2016*	Population figures quoted by community representatives
Dhoke Mangtal (UC 4)	33,390	43,000
Dhoke Hassu North (UC 5)	20,544	38,700
Dhoke Hassu South (UC 6)	19,980	34,000
Total Population	73,914	115,700

*Source: Punjab Development Statistics, 2016; Planning and Development Department, Government of Punjab, Lahore

1. Basic assessment information

Name community leaders (e.g. chairpersonunion council)	1. Waqas Ali (UC 6) 2. Atta-ur-Rehman (UC 6) 3. Muhammad Riaz (UC 5) 4. Irfan Mughal (UC 5) 5. Muhammad Tufail (UC 4)
Contact details and photo	See Part II.H
Date assessment conducted	04 July 2018
Attendance sheet filled	See below
Photos of consultation made	See Part II.H

2. Community profile

Provincial, District and municipal name	Province: Punjab; District: Rawalpindi; Municipality: Rawalpindi Municipal Corporation	
Community / union council name		Dhok Mangtaal (UC 4); Dhok Hassu North (UC 5); and Dhok Hassu (UC 6)
Location (on map)		Please see attached map
Total population (number)		Please see table above
Number or percentage	Female	47%

(please identify vulnerable groups in target areas – through discussion and data collection)	< age 14 (children)	37%
	age 15-24 (youth)	21%
	age 25-60	39%
	> age 60 (elderly)	3%
	(ex) Refugees / displaced (from where?)	An exact percentage is not known. However a number of Afghan refugee families reside in these communities. Besides a number of families have also moved from the tribal areas especially after the military operation against militants in Pakistan's former Federally Administered Tribal Areas which have recently been merged in Khyber Pakhtunkhwa Province.
	Informal people	Areas are informal
	Indigenous people	Not known
	HIV positive	Not known
	Disabled population	2%
	Other relevant	N/A
Households (number) + average per household		Based upon official population estimates for 2016: Number of Households: 11,371 Average Household size: 6.5 to 7 Based upon population figures provided by community representatives: Number of households: 16,528 Average Household size: 7
Poverty rate (%)		Around 60% households can be placed in the category of poor as they depend upon daily wage labour.
Access to electricity (%)		100%
Access to clean water (%) and type (borehole, piped)		Access to clean water: The quality of drinking water in these areas does not meet the prescribed standards as water contamination is a widespread issue. Types of Water Supply: • Tap water: 65-70% • Hand pumps: 2% • Boreholes: 25% • Wells: 1-2% • Water vendors: 5%
Access to sanitation (proper toilet) (%)		100%
Main livelihoods / income in community		60% households depend upon daily wage labour by working in nearby city markets or getting engaged in other menial labour. Only 12% households earn their living through formal sector employment. Around 10% individuals capable of earning are unemployed. The rest earn their living through trade, property rents, and manufacturing and different service sector jobs.
Issues	Floods (or risk areas)	Please see file titled meeting minutes
	Droughts (or risk areas)	
	WASH (issues)	Regarding drainage of household waste water, many areas do not have an

		underground sewerage system and instead depend upon open sewers in the streets. There is currently no facility for the treatment of sewage before its disposal to Lai Nallah.

3. Climate change – trends analysis

Expected outcome: Agreement on at least one or two climatic hazards, which have most impacted the community

Climate Change hazards	a) In the last 10 years, has the community been affected by:	Has this issue been getting:
Droughts (e.g. lack of clean water for household use, damage to crops)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say.
Extreme heat (e.g. resulting in electrical problems, health impacts, crop/fisheries damage)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
River flood (directly from main river)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Flash flood (local flooding due to poor drainage)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Storms/cyclones (e.g. destruction to house or goods, disruption to services, etc.)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Diseases (e.g. dengue, malaria, diarrhea)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say

Top 3 most problematic climatic hazards

Hazard	Occurrence between 2008 and 2018 (years)	Possible comment
1. Water Scarcity	Persistent hazard	
2. Water Borne Diseases	Persistent hazard	
3. Flooding in Nallah Lei and other drains	Recurrent hazard	

4. Climate change – questionnaire

These questions help to analyze current and future climate risks, barriers to adaptation and factors/resources facilitating the coping strategies used by community and way of improving their resilience.

What problems / effects does your community face because of the one or two most problematic climatic hazards (see result trend analysis) and how do these affect men, women, elderly, youth, disabled people, (ex) refugees in your community?

Most problematic climatic hazard	Problems / effects (e.g. agriculture destruction, lack of water or food for cattle, drinking water scarcity, disease, death, damages of houses or other assets, need to move somewhere else,	Who (what group) is most affected?	How does hazard impact those most affected?

	need to invest in protection, need to find other income)		
Water Scarcity	Water scarcity is the most pressing problem of the area. The municipal piped water supply does not meet household's needs. The water tables have drastically fallen. For boreholes, residents have to dig as deep as 300 feet. In various instances, even this effort fails. For a borehole, a household has to bear a cost of PKR 250,000 to 300,000 (US$ 2500 to 3000). Given high poverty rates in the area, all households do not afford to bear this cost. Hence they have to depend upon generosity of their neighbor to get water for domestic use. The public tube wells have been dug at the depth of 700 to 800 feet. Many public tube wells have gone dry. The local administration does not have funds to rehabilitate the existing ones or install new tube wells. Water vendors have installed private filtration plants and deliver a 20 liter container of water for PKR 50 (US$ 0.5) Water tankers also supply water in certain localities where they can move to. The official rate for a 10,000 liter water tanker is 400 PKR (US$ 4). However it is rarely available. People have to bribe for getting this facility. On average they have to pay PKR 1000 to 1500. Private vendors have also installed their tube wells. They provide a water tanker for PKR 2200 to 2500 (US$ 25 to 30). Couple of months back, the Supreme Court of Pakistan banned the operations of private tube wells/water hydrants. This drive has escalated the cost of a private tanker to PKR 5000 (US$50). An additional problem with water tankers is that they cannot access every locality thanks to narrow streets and congested/encroached roads.	The poor households are most affected. As they cannot afford to bear the cost of installing a borehole and neither can pay for availing the facility from private water vendors. The official water tanker facility is rarely available and even if available, only the influential ones or those who can pay the bribe access this facility.	Getting water for poor households who make up more than half of the community cost them socially as well as economically. In these households, collection of water largely rests with women and children. Sometimes they have to spend hours in this activity and hence to compromise their time which they can otherwise use for leisure or productive activities--education and employment. Cost of water is too high for poor households and it takes away a considerable portion of their meager incomes. With water available in limited quantities, poor households also have to compromise their hygiene needs which in turn affect their health. Scarcity of water is also a source of feuds among neighbors. While sharing of water shows local residents compassion, the consistent scarcity sometimes begin to tax these sentiments, resulting in weakening of community bonds.
Water borne diseases	The quality of drinking water available in the communities is also not up to the mark. The contaminated water is a source of number of water borne diseases including diarrhea, gastro	The poor households are among the most affected as they prefer quantity over	

	and hepatitis to name a few.	quality while getting water as charity from their well off neighbors.	
Floods	Floods are recurrent phenomenon thanks to the close proximity of Lai Nallah and presence of some natural drains. Absence of land planning and control has also contributed in localized flooding. The natural drainage channels as well as Lai Nallah have been encroached leading to narrowing of their traditional right of ways. In absence of an effective solid waste management system, the household, commercial and industrial waste ends up in local drains and Lai Nalla causing high levels of pollution. The abundance of plastic waste dumped on the banks of Lai Nallah contributes to flooding.	Although floods affect all, they affect most to those households who are located just next to the Lai Nalla and other drains. During last few years, more than 20 houses have been destroyed by flooding events. During rainy season the houses located next of Lai Nallah and other drains get affected almost annually.	

The magnitude of barriers to adaptation

What stops your community from coping with current impacts of the most problematic climatic hazards (see result trend analysis)? These can be e.g. lack of knowledge / education, lack of skills, lack of money, lack of land tenure, lack of irrigation, lack of drinking water supply, health issues, bad infrastructure, lack of drainage system, lack of natural resources like forests, etc.).

Most problematic climatic hazard	1) What is currently limiting your community from coping with or adapting to the impacts? (What makes it difficult for you to deal with them or makes it difficult to make changes to deal with them) 2) in what ways has your community already adapted to deal with these issues?	Ranking most important factors
Water scarcity	The groundwater has become the major source of water supply in the area. Over the years, water tables have dangerously gone down. For a borehole, households hav to dig as deep as 300 feet and even more. In many cases even going to this much depth does not avail any result. Since majority of households have very limited incomes, they can't afford this investment. A very large number of households in the community (more than half) are actually tenents. For this status they cannot make an investment in water bores and hence have to depend upon their house owners. The municipal authorities are of the view that unless there is made a major investment in water sector, they cannot provide a sustained supply of water to households. A proposal is still pending with National Assembly of Pakistan about drawing water from River Indus at the point of Ghazi Brotha located in neighboring Attock district. Besides requiring a huge investment then runs in tens of billions of rupees; drawing water from Indus for urban water supplies need a lot of political consensus and agreement among provinces-hence a very lenghty process. Households have not thought of rainwater harvesting options at community or household level. This is largely due to lack of awareness and technical knowhow.	1. Absence of water sector planning at various levels. 2. Absence of large scale investments in water sector development 3. Lack of awareness and technical

	Adaptation: In absence of an efficient municipal water supply, people have resorted to boreholes putting in huge investments. Water vendors have emerged supplying water in large quantities as well as filtered water for drinking. This has generated new business opportunities. People have installed suction pumps on water supply pipes. According to them without these pumps they do not get water from municipal water supply. This activity is illegal, but it is going on unchecked.	support.
Water borne diseases	People do not have a control on quality of water being supplied through municipal authorities as well as water vendors. The drinking water quality standards are not followed. There is no regulatory body to ensure the quality of water from these sources. The general lack of awareness and absence of options are also contributing factors. Adaptation. Households who can afford have installed water filters while some also practice boiling of water before consumption for drinking purposes.	
Floods	Efforts by the local authorities to launch annual cleaning drives for Nallah Lai have contributed in recurrence of flooding in Nallah Lai. However the dumping of solid waste in it is going unchecked. The communities, although themselves contributing in this problem, find them helpless in this regard. They argue that since a proper solid waste management system does not exit, they have to resort to open dumping of waste. Adaptation: Households located next to Nallah Lai and other drains largely keep their ground floors free of furniture and other hard to move objects especially during the flooding season. At some places, people have constructed small embankments, walls to remain safe from flooding. However this strategy rarely helps.	

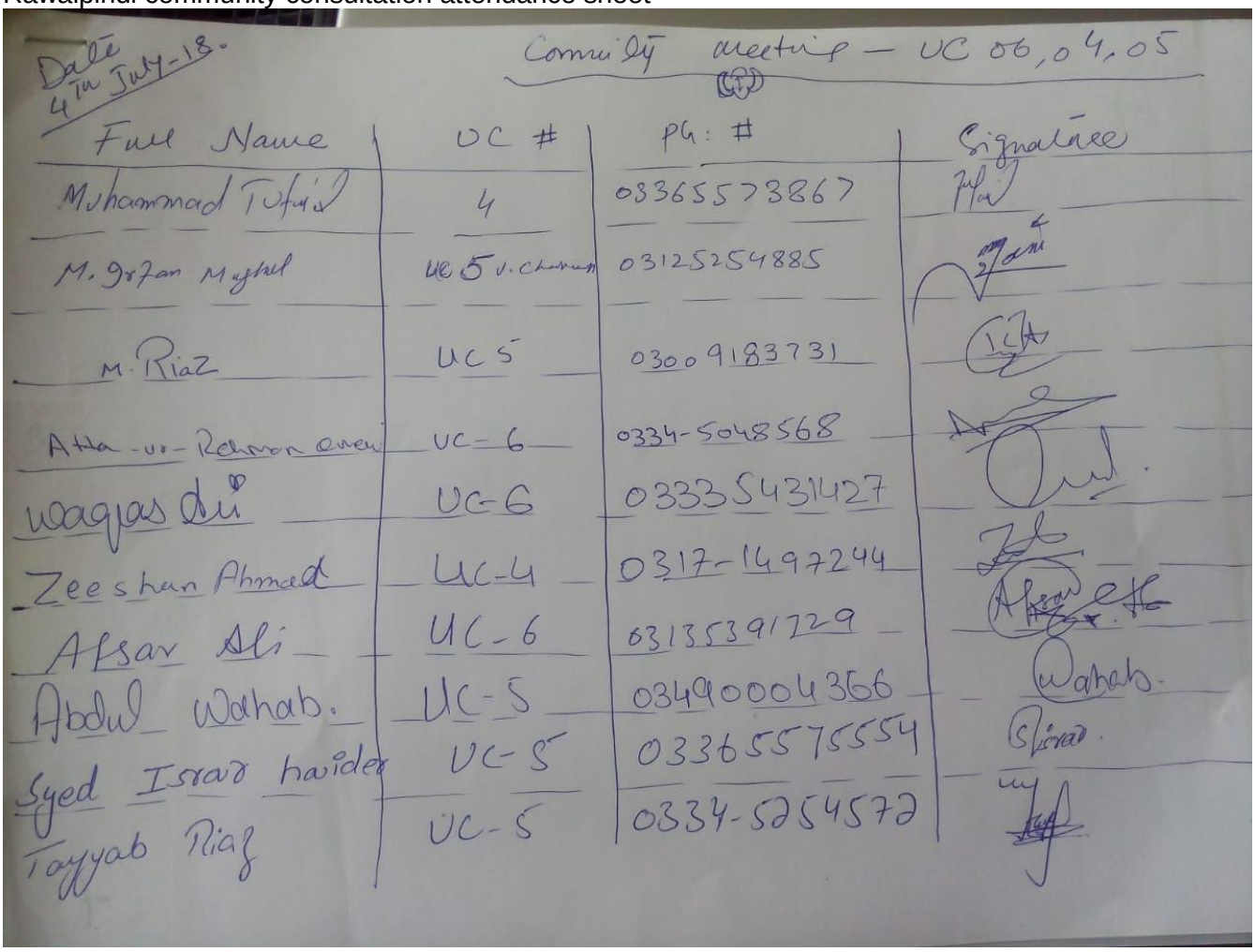
The priorities to be addressed in strengthening the adaptive capacity of the community.

What activities should take place or infrastructure constructed in order to improve your adaptive capacity to droughts / water scarcity, floods, landslides, heat, and diseases? What is most important for the community?

Most problematic climatic hazard	Activity and/or infrastructure	Ranking most important activity and/or infrastructure
Water Scarcity	• Construction of new dams • Rehabilitation of existing tube wells • Installation of new tubewells. • Financial support to households for installation of hand pumps and boreholes. • Drawing water from Kohala, a point at the confluence of Murree and Azad Jammu and Kashmir (AJK) where river Jehlum enters Punjab from AJK. • Drawing water from Ghazi Brotha, a water works at River Indus in neighboring Attock district.	Rehabilitation of existing tube wells Installation of new tube wells Financial assistance to poor households for installation of hand pumps and boreholes.
Water borne diseases	• Replacement of ageing water supply pipes • Laying of water supply pipes in a manner that they are not close to sewerage system.	All of these are priorities.

	• Installation of water filtration plants and their regular maintenance • Financial assistance to poor households for installation of domestic water filtration systems. • Boiling/disinfection of water before consumption. • Awareness campaigns	
Flooding	Cleaning of Nallah Lai and other drains to make them free of solid waste Construction of retaining walls and embankments Deepening of the Lai Nallah's course by at least 5 to 6 feet. Realignment of Lai Nallah's course	

Rawalpindi community consultation attendance sheet



Date 4th July-18.

Community meeting – UC 06, 04, 05

Full Name	UC #	Ph: #	Signature
Muhammad Tufail	4	03365573867	
M. Irfan Mughal	UC 5 V. Chairman	03125254885	
M. Riaz	UC 5	03009183731	
Atta-ur-Rehman awan	UC-6	0334-5048568	
waqas dil	UC-6	03335431427	
Zeeshan Ahmad	UC-4	0317-1497244	
Afsar Ali	UC-6	03135391229	
Abdul Wahab.	UC-5	03490004366	
Syed Israr haider	UC-5	03365575554	
Tayyab Riaz	UC-5	0334-5254572	

Rawalpindi women focus group discussions

RAPID COMMUNITY SURVEY
BUILDING URBAN CLIMATE RESILIENCE IN PAKISTAN
UN-HABITAT - ADAPTATION FUND
Focus: women groups
Method: focus group discussion

1. Basic assessment information / contact person details

Name group representative	Iqbal Bibi
Contact details and photo	+92 331 509 1971 For photos please see the attached folder
Date assessment conducted	01 Aug 2018
Attendance sheet filled	See below
Photos of consultation made	See Part II.H

2. Climate change – trends analysis

Expected outcome: Agreement on at least one or two climatic hazards, which have most impacted the community

Climate Change hazards	a) In the last 10 years, has the community been affected by:	Has this issue been getting:
Flooding (directly from Lai Nallah)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Diseases (e.g. dengue, malaria, diarrhea)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Droughts (e.g. lack of clean water for household use)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say.
Extreme heat (e.g. resulting in electrical problems, health impacts, crop/fisheries damage)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say

Top 3 most problematic climatic hazards

Hazard	Occurrence between 2008 and 2018 (years)	Possible comment
1. Flooding	Almost annually this community is affected by floods in Lai Nallah	Owing to its being located next to Lai Nallah, the community gets affected by flooding in Lai Nallah almost in every monsoon season. The risk of getting affected also remains intact during winter's rainy season.
2. Diseases	Persistent risk	The community suffers from poor sanitary conditions. The existing sewerage system consists of open street sewers that directly dispose sewage in Lai Nallah. Especially during flooding season, the street sewers get choked causing overflowing of household sewerage system. The available drinking water is not fit for drinking and hence contributes to water borne diseases. The overall poor sanitary conditions compounded by absence of an effective solid waste management system in the community also contribute to the disease burden.
3. Scarcity of clean water for drinking and	P ersistent phenomenon	The available water for drinking and other household uses does not meet the minimum standards. Often the water being supplied by municipal water supply system stinks. The

household use		groundwater extracted through boreholes also is not of good quality.

3. Climate change – questionnaire

These questions help to analyze current and future climate risks, barriers to adaptation and factors/resources facilitating the coping strategies used by groups and way of improving their resilience.

What problems does your specific group (women, elderly / disabled, youth, (ex) refugees, etc.) face because of the one or two most problematic climatic hazards (see result trend analysis)

Most problematic climatic hazard	Problems / effects (e.g. agriculture destruction, lack of water or food for cattle, drinking water scarcity, disease, death, damages of houses or other assets, need to move somewhere else, need to invest in protection, need to find other income)	How does hazard impact your group specifically?
1. Flooding	Dhok Najju is located immediately next to Lai Nalla. An unplanned settlement, it has grown haphazardly over the years. Today it is a densely populated area. The consecutive governments and municipal authorities have not paid any heed for the planning and development of the area like many other older parts of Rawalpindi city. Thanks to these factors, flooding is a recurrent phenomenon that hits the locality almost annually. The floodwaters enter houses damaging the household items and hence causing financial losses to households besides affecting the housing structures. In many instances, the floodwaters also damage the household food stocks. The community does not have dedicated storm sewers and drainage of storm and flood water is totally dependent upon the undulating terrain/topography of the area. The flood and rainwater undermines the sewerage system of the area, causing the sewers to overflow to an extent that even the human excreta flows into houses--a disgusting issue that troubles the household most.	Women being responsible for housekeeping have to put a lot of effort and time in cleaning their houses whenever these are affected by floodwaters. The monsoon season brings fear and especially women have to stay extra conscious spending sleepless nights. In absence of any effective early warning system in place and lack of preparedness on part of households they have been caught unaware by the floods during late in the nights or early in the morning when households were asleep.
2. Diseases/ Epidemics	Epidemics are not uncommon and disease burden is high in Dhok Najju like many other localities having similar features. Diarrhea, dengue, malaria, hepatitis, dermatological ailments are common diseases in the area. The local residents consider the poor sanitary conditions and contaminated water as being responsible for this situation. The concerned municipal institutions do not take any preventive measures to address this situation. Anti malaria and dengue campaigns involving fumigation of the area are occasionally launched. However so far these measures have not borne any fruits so far.	The prevalence of water borne disease and epidemics especially affects younger children. Taking care of them primarily comes to women increasing their burden and affecting their productive time. Disability among children is especially high. One in every 15 to 20 households have one or more children suffering from some physical or mental disability.
3. Scarcity of clean water for drinking and other household uses	Dhok Najju suffers from an extreme shortage of clean water. The water supplied through municipal piped water supply stinks and is highly contaminated and hence is not used for drinking. Boreholes are not common. The piped water is supplied for two hours daily.	Women have to travel almost two kilometers to bring drinking water from two nearby water sources--private boreholes. Those women who can afford hire an auto rickshaw to haul the drinking water. Women who do not afford had to walk to perform this duty.

		This consistent strain involves lot of hassle and stress compromising women's leisure and productive time and energies.

The magnitude of barriers to adaptation

What stops specifically your group (women, elderly / disabled, youth, (ex-)refugees, etc.) from coping with current impacts of the most problematic climatic hazards (see result trend analysis)? These can be gender roles, illegal status affecting tenure, illegal status affecting employment options, lack of knowledge / education, lack of skills, lack of money, etc.

Most problematic climatic hazard	3) What is currently limiting your group from coping with or adapting to the impacts? (What makes it difficult for you to deal with them or makes it difficult to make changes to deal with them). Please discuss Differentiated climate change impacts on women and their differentiated capacities do adopt to these, gender division of labor and gender-based power structures 4) in what ways has your group already adapted to deal with these issues?
1. Flooding	- The location of Dhok Najju that makes it an immediate neighbor of Lai Nallah poses a persistent risk of flooding. - Over the years, the community has encroached the banks of Lai Nallah and hundreds of households are compelled to live in the flood zone. - The municipal authorities have not made any efforts so far to enforce building codes and land use control. - A proper sewerage system does not exist. Household sewage flows in open street sewers before its final disposal in Lai Nallah. - No effective early warning system exists. - Community based flood management system is not heard about. The community and households are not prepared that lead to their consistent vulnerability to flood risks. - Effective community based governance and decision making systems do not exist. Women are not involved in any community based decision making. - Poverty is rampant. Men in many households resort to daily wage labor while women contribute in household incomes by working as domestic servants or undertaking works like sewing/tailoring in their homes. Adaptation: - During flood seasons, households normally remove easily removable household items from ground floors. However given smaller sizes of houses (many are one room houses) they have very little space to take this measures. - Flood warnings are aired from loudspeakers of mosques. However these do not prove very effective.
2. Diseases/ Epidemics	- Most of the households are poor and disease burden is high. No social safety nets or subsidized healthcare facilities are available to households. - In absence of interest from the local authorities, the community finds it helpless to address the causes that are contributing to poor sanitary conditions and disease burden of the community. Adaptation So far no visible adaptation measures are in place against this situation.
3. Scarcity of clean water for drinking and other household uses	- The community finds itself helpless against the persistent unavailability of clean water. - Most of the households are poor. The meager earnings do not afford them the opportunity to invest in water filtration or other effective measures for having clean water for household uses. - Generally households do not have knowledge of household level low cost but effective water purification technologies. Adaptation: Since water available from existing municipal supplies is not drinkable, especially women travel to nearby two water sources to fetch water for drinking.

The priorities to be addressed in strengthening the adaptive capacity of the group

What activities / interventions should take place to adapt to climate change hazard impacts (e.g. address floods or droughts / water scarcity? What is most important for the group?

Most problematic climatic hazard	Activity / intervention
1. Flooding	- Lai Nallah should be covered - If Lai Nallah is not covered, its walls should be lined with retaining walls - Government should install a proper sewerage system
2. Diseases/ Epidemics	- The community considers the proximity of Lai Nallah, poor sanitary conditions, absence of sewerage system, unavailability of clean drinking water as being the major cause of epidemics and disease burden. Hence government should take measure to address this situation, women believe.
3. Scarcity of clean water for drinking and other household uses	- Install community level water filtration plants - Ensure the supply of clean water through municipal supplies.

If these activities, interventions (e.g. dam to reduce floods, water harvesting facilities at community or household level) are provided, what would be your main concern and needs (e.g. related to employment, health, water access, food security, tenure security, resettlement, etc.?)

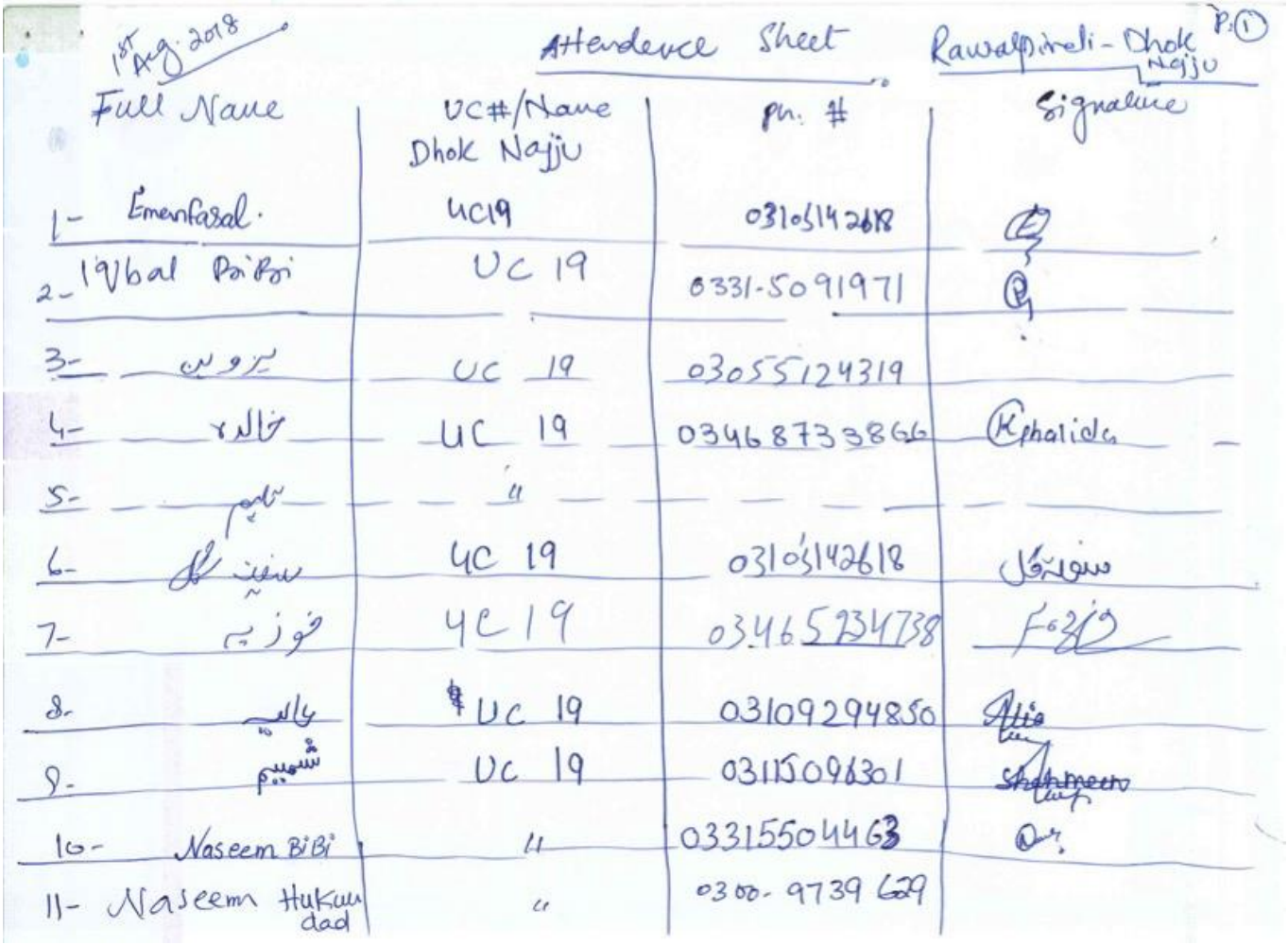
Activity / intervention	Concerns and needs
Flood protection measures involving clearance of encroachments from Lai Nallah's banks	Concerns : Displacement and resettlement Needs: Many households are tenants. In many instances a dwelling unit is occupied by as high as seven to eight families, each occupying one room while sharing the toilet facility. On average a household pays PKR 5000-6000 as monthly rent. This amount takes away major portion of their meager incomes. These households find them unable to financially contribute in any of the project activities. They also fear that flood protection measures involving removal of encroachments from Lai Nallah's banks may lead to their displacement. They further emphasize that they find it extremely difficult to get housing facilities within the city with low house rents that they can afford. The displacement, they fear, will only increase their difficulties.
Construction of dams/water reservoirs	The respondent women had little idea of these measures and how they may affect their lives. What they emphasize repeatedly is protection from recurrent floods.
Community level and household based rainwater harvesting	Women had not heard about these technologies. However on getting an idea of these interventions, they explained that their locality/neighborhood was densely populated having no space to serve as water collection pond. They were also of the view that since they were tenants and poor they would not be able to invest household level rainwater harvesting technology.

Group skills, strengths and leaders.

What is the group good at doing or what are the strengths? (e.g. committees, successful projects working together, construction or organizing skills, good connections outside community)	1) How can this be used for addressing floods, water scarcity, etc.? 2) Who will be the leader for making this happen? (what community committees can help with this?)
The community has a strong sense of togetherness. Women mentioned that they and their households would be ready to contribute	This sense of togetherness can be transformed into effective community organization and can be encouraged to undertake community driven or community led initiatives.

their labor in any community led interventions.	
Many household know the construction skills as men work as masons and construction labor.	These skills can be harnessed for community based/community led initiatives involving simple construction skills.
The community has a strong urge to improve their living conditions	This urge can be harnessed to mobilize the community for community based initiatives.

Rawalpindi women focus group discussion attendance sheet



Attendence Sheet — Rawalpindi - Dhok Najju — P.①

1st Aug. 2018

Full Name	UC#/Name Dhok Najju	Ph. #	Signature
1- Emanfasal.	UC19	03105142618	
2- Iqbal Paribi	UC 19	0331-5091971	
3- [illegible]	UC 19	03055124319	
4- [illegible]	UC 19	03468733866	Khalida
5- [illegible]	"		
6- [illegible]	UC 19	03105142618	[illegible]
7- [illegible]	UC 19	03465234738	[illegible]
8- [illegible]	UC 19	03109294850	[illegible]
9- [illegible]	UC 19	03115096301	[illegible]
10- Naseem BiBi	"	03315504463	[illegible]
11- Naseem Hukumdad	"	0300-9739629	

P-2

Name	UC # Name	Ph. #
12 - Tasleem	19	0343-3867855
13 - Shamim Akhtar	〃	0311-5172379
14 - Mehnaz Bibi	〃	0342-8541843
15 - Perveen Akhtar	〃	0312-5001696
16 - Uzma	〃	0314-9526074
17 - Sarina	〃	0316-0907636
18 - Fehmida Khatoon	〃	0311-5469260
19 - Shehnaz	〃	0311-555 8974
20 - Rukhsana	〃	

Nowshera community consultations

RAPID COMMUNITY SURVEY
BUILDING URBAN CLIMATE RESILIENCE IN PAKISTAN
UN-HABITAT - ADAPTATION FUND
Focus: community level – union councils (most vulnerable communities in target areas)
Method: group discussion

1. Basic assessment information / contact person details

Name community leaders (e.g. chairperson union council)	Mr Aqeel Rehman Area Supervisor, Tehsil Municipal Administration, Nowshera
Contact details and photo	 +92 315 5879 619 For photos please see attached folder
Date assessment conducted	01 Aug 2018
Attendance sheet filled	See below
Photos of consultation made	See Part II.H

2. Community profile

Provincial, Districtand municipal name	Province: Khyber Pakhtunkhwa District: Nowshera Municipality: Tehsil Municipal Administration (TMA), Nowshera	
Community / union council name		Union Council: Nowshera Kallan
Location (on map)		Please see attached map
Total population (number)		Nowshera Kalan--the area of the city proposed to be targeted with AF project has a total population of 83,567 as per the population census results of 2017. This population is distributed in 12, 445 households.
Number or percentage (please identify vulnerable groups in target areas – through discussion and data collection)	Female	48%
	< age 14 (children)	38%
	age 15-24 (youth)	20%
	age 25-60	40%
	> age 60 (elderly)	2%
	(ex) Refugees / displaced (from where?)	Nowshera district had once sheltered a very large number of Afghan refugees. In recent years it became one of the main areas where IDPs from trouble hit tribal areas and Swat took refuge. However the exact population of this refugee population in Nowshera Kalan is not known.
	Informal people	Not known
	Indigenous people	Not known
	HIV positive	Not known
	Disabled population	2-3% of total population
	Other relevant	
Households (number) + average per household		Nowshera Kalan: 12445 Households as per population census of 2017. The average household size is 6.7 persons per household as per census 2017.
Poverty rate (%)		According to respondents, more than 50% households in Nowshera Kalan are poor.

Access to electricity (%)	100%
Access to clean water (%) and type (borehole, piped)	Household water supply source in Nowshera city: Tap water: 27% Hand pump: 22% Motor pump: 47% Dug well: 2% Other: 2% (Source: Pakistan Social and Living Standard Measurement Survey (2014-15), Pakistan Bureau of Statistics, Government of Pakistan)
Access to sanitation (proper toilet) (%)	97% households have a proper flush latrine facility (Source: Pakistan Social and Living Standard Measurement Survey (2014-15), Pakistan Bureau of Statistics, Government of Pakistan)
Main livelihoods / income in community	The male members of households in many households earn their living through menial labor in Nowshera and other places in Pakistan. Nowshera's construction workers are famous for their skills in plastering. The other livelihood sources include government jobs, jobs in small scale industry, shop keeping etc. Very few females are in paid employment. Mostly the educated women are serving as teachers in government schools.

3. Climate change – trends analysis

Expected outcome: Agreement on at least one or two climatic hazards, which have most impacted the community

Climate Change hazards	a) In the last 10 years, has the community been affected by:	Has this issue been getting:
Droughts/scarcity of clean water (lack of clean water for household use)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say.
River flood (directly from main river)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Diseases (e.g. dengue, malaria, diarrhea)	i) Yes, a lot, ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say

Top 3 most problematic climatic hazards

Hazard	Occurrence between 2008 and 2018 (years)	Possible comment
1. Drought/scarcity of clean water	Persistent problem	The available water from municipal supplies stinks and is highly contaminated. The ground water up to the depth of 100 ft is not fit for human consumption. Going further deep one may get somewhat cleaner and purer water.
	Persistent risk. The biggest	River Kabul flows through the city. The old

2. River flooding	flooding event in the known history of Nowshera occurred in 2010. However settlements/neighborhoods located in immediate vicinity of River Kabul recurrently get affected even by low level floods in the river	city (which is proposed to be targeted with this intervention) is located on the left bank of River Kabul. Over the years, the haphazard and unplanned growth of the city resulted in encroachment of river banks. Whenever river overflows the surrounding localities are inundated.
3. Diseases/epidemics	Persistent risk	There is high prevalence of diseases like dengue, gastro, diarrhea, choler and hepatitis. Local residents attribute them to poor sanitary conditions of the city. The disease outbreak intensifies in flooding seasons.

4. Climate change – questionnaire

These questions help to analyze current and future climate risks, barriers to adaptation and factors/resources facilitating the coping strategies used by community and way of improving their resilience.

What problems / effects does yourcommunity face because of the one or two most problematic climatic hazards (see result trend analysis) and how do these affect men, women, elderly, youth, disabled people, (ex) refugees in your community?

Most problematic climatic hazard	Problems / effects (e.g. agriculture destruction, lack of water or food for cattle, drinking water scarcity, disease, death, damages of houses or other assets, need to move somewhere else, need to invest in protection, need to find other income)	Who (what group) is most affected?	How does hazard impact those most affected?
1. Drought/ scarcity of clean water for human consumption	Despite being neighbor of River Kabul, Nowshera city suffers from scarcity of clean water for human consumption. In many areas of the city, the water is supplied by municipality. However in most the cases this water is found to be highly contaminated. For instance one of the main overhead water tanks is located just next to a waste dumping site. Local residents consider this situation as one of the factors contributing to contamination of water. Local residents also highlight that city waste water is disposed untreated into the river. This problem is further compounded by the fact that the city has three main slaughter houses. The waste generated from slaughtered	People of all ages and all sexes are affected. However it is the poor households and children who are most affected from water borne diseases.	Incidences of diarrhea are high among the infants and younger children. The poor households owing to their not being able to afford water purification/filtration systems are compelled to consume the contaminated water. The burden of disease not only causes health problems but also causes economic losses by reducing the productive time available to poor families. Prevalence of hepatitis is also very high. This situation has caused a number of deaths. Local residents attribute the poor quality of drinking water

	animals is disposed directly into the river. The water supply pipes and street sewer, at various locations, run parallel. This is also one of the main reasons for high incidence of water contamination. Kabul River has been turned into a dumping site for solid waste of the city besides its being the disposal point for city sewage. The high level of contamination of Kabul River is one of the major reasons for contamination of water available for human consumption.		as being the main reasons for this situation. Poor households have to allocate a considerable portion of their meager incomes on healthcare. Their limited financial affordability does not allow them to avail better quality healthcare. This situation makes them caught in a constant spiral of disease and poverty.
2. River flooding	Four union councils of Nowshera city are located immediately next to Kabul River. These union councils include Chowki Town, Nowshera City, Kabul River, and Nawan Kallae. Residents in these localities recurrently get affected from flooding in Kabul River. The super floods of 2010, made Nowshera capture newspapers' and news channels' headlines. The city stood among the most flood affected areas of Pakistan. In some localities, the floodwaters reached the height of more than 20 feet destroying and damaging a very large number of residential, commercial, institutional and industrial buildings. In areas of city where agriculture and livestock rearing is still practiced, these livelihood sources get recurrently affected by floods in Kabul River.	Neighborhoods located next to Kabul River are most vulnerable. In absence of any meaningful enforcement of building codes and land use control, city has grown along the River Kabul encroaching upon its banks. Hundreds of residential, commercial, institutional and industrial structures are located dangerously close to river Kabul. Besides River Kabul a number of natural water channels that drain into River Kabul also pass through the city. During rainy season, these channels also cause flooding inundating neighboring areas.	Settlements located in close proximity to River Kabul and water channels that drain into the river are among the most vulnerable areas. The poor households that make up the majority of these settlements are little prepared to reduce their vulnerability to recurrent flooding events.
3. Diseases/epidemics	Contaminated drinking water, poor sanitary conditions and hygiene practices are considered by the community as main causes of high prevalence of diseases. The disease outbreak intensifies especially during flooding season.	Poor households are among the most affected ones. Infants and younger children get most affected by water borne	

	During last few years, Nowshera had been among the areas of the province most affected by dengue outbreak. Dozens of individuals have so far lost their lives to dengue.	diseases. Prevalence of hepatitis is high among all age groups.	

The magnitude of barriers to adaptation

What stops your community from coping with current impacts of the most problematic climatic hazards (see result trend analysis)? These can be e.g. lack of knowledge / education, lack of skills, lack of money, lack of land tenure, lack of irrigation, lack of drinking water supply, health issues, bad infrastructure, lack of drainage system, lack of natural resources like forests, etc.).

Most problematic climatic hazard	5) What is currently limiting your community from coping with or adapting to the impacts? (What makes it difficult for you to deal with them or makes it difficult to make changes to deal with them) 6) in what ways has your community already adapted to deal with these issues?
1. Drought/ scarcity of clean water for human consumption	- The local government/municipal authorities of Nowshera city are severely resource constraint having no substantial funds and technical capacity to address city's chronic problem of scarcity of clean water for human consumption. - The community members find them helpless in getting rid of this issue. - The elected representatives make promises at time of elections but have so far not taken any meaningful steps to fulfill citizens' demands. - Citizens consider that supply of water is responsibility of government. Especially poor and lower middle-income households do not afford to Install boreholes to extract groundwater from safer depths -Households generally are not aware of household level low cost water treatment technologies as is apparent from lack of availability of these technologies. - Water harvesting at community and household levels has never been considered as an option. Most of the respondents had not heard of them even. Adaptation: People who can afford resort to use of bottled water as well as installation of household water filters. The poor however resort to consumption of contaminated water compromising their health.
2. River flooding	- The concerned institutions have so far not taken well planned flood mitigation measures arguing they do not have required financial resources. - The communities are not familiar with community-based flood management measures. - An effective early warning system and response mechanisms are not in place. - Flood resilient building codes and practices and land use controls are not in place. - The city has grown haphazardly in absence of any meaningful city development and management plans and strategies. - The very location of the city places it perpendicular to River Kabul. When there is flood in the river, it forcefully hits the city. River Kabul drains into River Indus. When Indus is in high flood it blocks the flow of River Kabul causing flooding in the upstream Nowshera. Likewise, when there is flood in River Kabul, the floodwaters start flowing back in the channels that pass through the city and during normal days drain into River Kabul. This situation intensifies flooding in the city. - Like River Kabul, the natural water channels that pass through the city have also been

	encroached. At certain locations, buildings have been erected even in the beds of water channels. When rainwater flows in these channels it causes damage to these structures. - The city has a poor drainage system. During floods 2010, the floodwater stagnated in various low-lying areas of the city for many days. - The river and the water channels have been turned into dumping points for city's solid waste. This situation chokes them and obstructs the free flow of flood waters. Against this situation, the local residents find them helpless to take any meaningful measures on their own. The local administration has limited financial resources at their disposal. They are understaffed and lack technical capacity to deal with this challenge. So far, no effective disaster management plan or strategy has been chalked out for resilience of Nowshera. Whatever flood response measures are taken, are reactive in nature and normally comprise of evacuation and relief. The measures that could meaningfully reduce the vulnerability of the citizens and city and enhance their capacities are simply not in place. Adaptation: At certain points, the concerned authorities have constructed embankments or have constructed retaining walls for river lining. Although these measures have marginally contributed in controlling floods, the citizens do not consider them enough to control flooding on sustainable basis. Households who can afford have moved to safer locations. However, the dwelling they have left/sold have been occupied by those who do not find safer alternatives.
3. Diseases/epidemics	- The city has an ailing municipal water supply system. The municipal authorities neither have financial resources nor have technical skills at their disposal to address city's chronic water contamination challenge. Many households have installed hand pumps as main source of water supply. However, these too do not deliver clean drinking water. To get somehow cleaner water, one has to dig more than 100 feet to install boreholes. Poor households do not afford this investment. In the aftermaths of floods, the groundwater sources get further contaminated. Concerned authorities have so far been unsuccessful in launching effective public health awareness campaigns and preventive measures to control outbreak of dengue, malaria and diarrhea. Official of local administration recall that only once in last five years they had managed to distribute mosquito nets in communities most affected by malaria and dengue. City's public health system does not have capacity to fulfill citizens' health needs. Adaptation: - To suffer silently appears to be only adaptive strategy poor citizens have at their disposal.

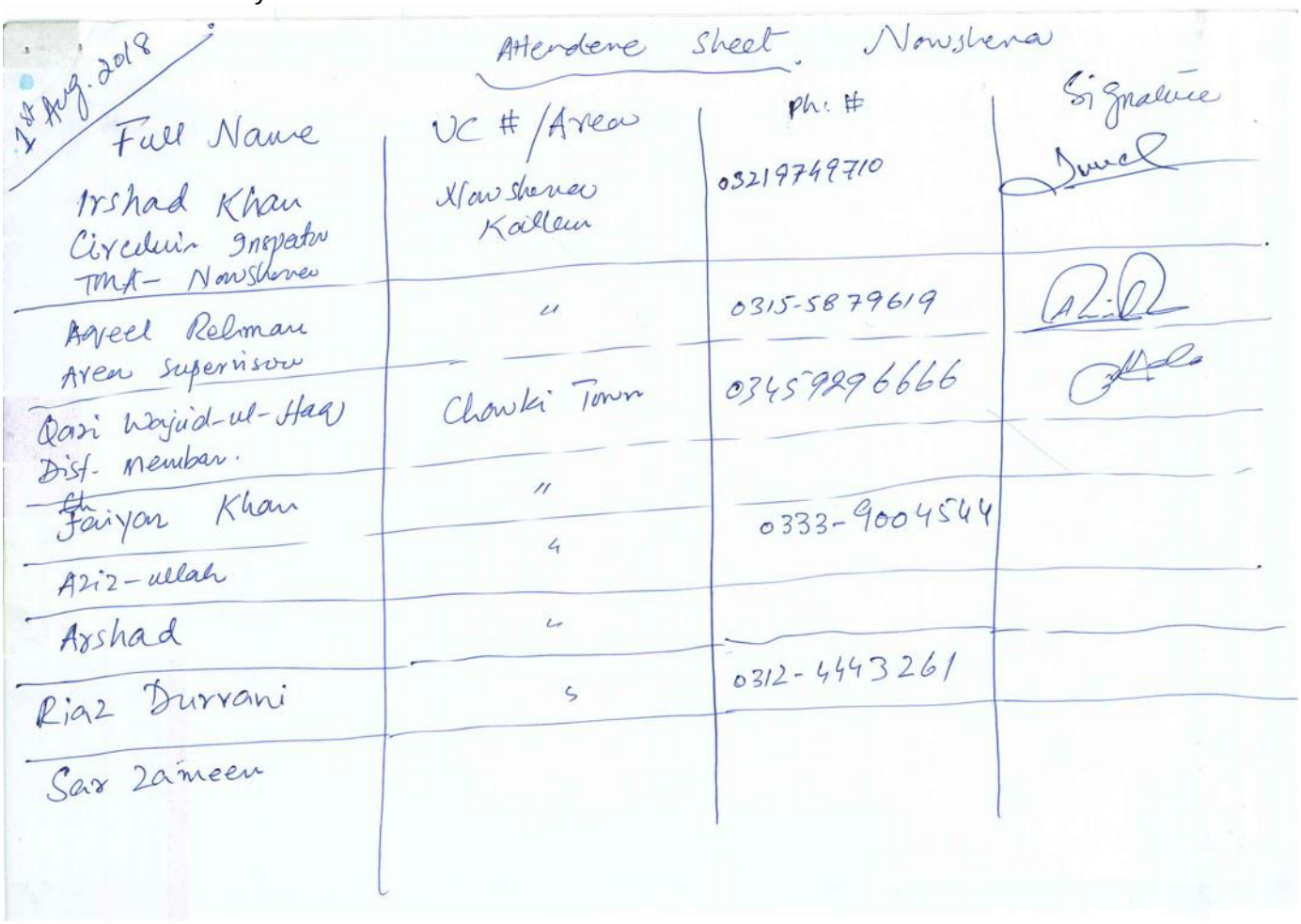
The priorities to be addressed in strengthening the adaptive capacity of the community

What activities should take place or infrastructure constructed in order to improve your adaptive capacity to droughts / water scarcity, floods, landslides, heat, and diseases? What is most important for the community?

Most problematic climatic hazard	Activity and/or infrastructure
1. Drought/ scarcity of clean water for human	- The concerned authorities should install deep tube wells to ensure cleaner supply of water. - City's water distribution system should be overhauled.

consumption	- Water filtration plants should be installed in every neighborhood and these plants should be regularly maintained. - Concerned authorities should design an effective waste management plan for liquid and solid waste to stop the contamination of drinking water from them.
2. River flooding	- Construction of retaining walls and embankments. - Construction of check dams and water storage ponds - Installation of an effective flood early warning system.
3. Diseases/epidemics	- Fumigation of city on regular basis. - Construction of slaughter houses in a way that their waste is not disposed in the river. - Introduction of an effective system for management of solid and liquid waste.

Nowshera community consultation attendance sheet



1st Aug. 2018 — Attendene Sheet. Nowshera

Full Name	UC # / Areas	Ph: #	Signature
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Qazi Wajid-ul-Haq Dist. member.	Chowki Town	0345-9296666	
Faiyaz Khan	"	0333-9004544	
Aziz-ullah	"		
Arshad	"		
Riaz Durrani	"	0312-4443261	
Sar Zameen			

ANNEX 2: strategy to comply to the AF Environmental and Social Policy (ESP) and Gender Policy (GP)

Content:

1. Introduction
2. Environmental and social risks and impacts of the project and activities
3. Environmental and Social Risks and Impacts Management Plan (ESMP)
4. Specific gender approach and baseline

1. Introduction

Purpose

The purpose of this annex is to demonstrate compliance of the project with the AF ESP and GP. In line with UN-Habitats Environmental and Social Management System and in line with the Adaptation Fund ESP and GP, UN-Habitat and partners need and will ensure that all proposed project activities and the project as a whole promote positive environmental and social benefits and mitigate or avoid adverse environmental and social risks and impacts and mainstreaming equal access among women and men, while building their resilience and capability to adapt to climate change impacts. This annex will be published for public consultation during the full proposal development phase. A summary of the project will then be included below.

Process to comply to the AF ESP and GP

At the full proposal phase, all project activities will be screened in detail against the 15 AF risk areas (i.e. safeguards) to identify potential risks and to assess potential environmental and social impacts. Besides that, an ESMP will be developed. At this stage (i.e. concept note), * an initial analysis / overview of the identified environmental and social risks and impacts and co-benefits and opportunities of the project activities with a special emphasis on gender is provided. In line with the GP, a gender approach and baseline are provided in a designated section. This is necessary in order to establish a data baseline at the project start against which implementation progress and results can be measured later. Data and analysis are provided based on community surveys, focus groups discussions, community planning and decision-making processes during the project proposal development phase.

*This annex is a ‘work in progress’ annex. Thus, more details will be provided during the full proposal development phase.

Summary of project

To be inserted at full proposal development phase.

2. Environmental and social risks and impacts of the project and activities

Screening and categorization and environmental and social impact assessment

An initial screening has been carried out to identify potential environmental and social risks of proposed project activities and based on that, of the entire project. With this information, the entire project has been categorized. Because of the nature of the activities under component 2, the entire project is regarded as a medium risk (Category B) project. Therefore, an ESMP will be developed at the full proposal phase. Also, further details will be provided at the full proposal phase. For an overview of the outcomes of risk screening and impact assessment outcomes at the concept note phase, see table 20 below. For a description of the analysis see the section below the table.

Table 20: Overview of initial risk screening and impact assessment outcomes of project activities. For details, see below analysis per AF principle

Project activities		(Design) details				Risk screening outcome	Impact assessment
Component	Detailed activities	Location	Number of beneficiaries	Dimensions	Description		
Component 1: Enhance community- and household-level flood resilient water harvesting facilities (using innovative techniques) and to strengthen capacities to plan, construct, operate, maintain and duplicate these.	Output 1.1. (concrete) 5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	Rawalpindi: especially UC 4,5 and 6, but also 1,2, 12 and 37 Nowshera Kalan	Direct: 35000 Indirect: around 200.000	See figure 15 (household level)	See figure 15 and annex 4	Communities and vulnerable groups (especially women, youth, some Afghan families) need to be involved continuously; further, more details will be provided during full proposal phase for potential risks	Since the intervention is at household level and construction takes place at this level (roof) potential negative impacts are at this level and thus require full involvement of beneficiaries
	Output 1.2. 8 union council-level community plans developed, community members (especially women and youth) trained and practical guide developed to plan, construct, operate, maintain and duplicate water harvesting facilities at community level	Rawalpindi: especially 4,5 and 6, but also 1,2, 12 and 37 Nowshera Kalan	200.000	1 plan per UC	A planning process will take place to involve groups equally and to develop plans and to train community members, especially women and youth	Vulnerable groups need to be consulted and involved equally	Although the activity does not entail an infrastructure interventions, it need to be ensured vulnerable groups are involved and benefit equally; the number of direct training beneficiaries will be around 210 (30 per community)
Component 2 Enhance city and district-level up-stream water	Output 2.1. (concrete) 40 district / city-level water harvesting facilities	Rawalpindi: especially UC 1,2, 4,5, 6, 12 and 37 + whole of	Direct: 200.000 (for floods) Estimatio	Small water reservoirs with costs of USD 30.000 Dimensions	Small water reservoirs will be constructed on public land	Communities and vulnerable groups in construction area and downstream impact area need to be involved continuously; further,	The construction of water reservoir may have an impact flood impacts downstream and water availability.

harvesting facilities (that also reduce flood impacts down-stream) and strengthen capacities to plan, construct, operate, maintain and duplicate these	constructed (or smaller number if possible)	Rawalpindi Nowshera District	ns for water use to be made	10-100 meter		more details will be provided during full proposal phase for potential risks related to human rights, core labour rights, protection of natural habitats, conservation of biological diversity, climate change, pollution prevention and resource efficiency, public health and land and soils conservation	Because the intervention will not increase flood impact and increase water availability, it is not considered as high risks. However, the intervention can have some negative impacts on potential risk areas identified on the left.
	Output 2.2. Two ditrsict / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including comprehensive water harvesting plans.	Rawalpindi city Nowshera city	2 million 200.000	One strategy per district / city	Vulnerable groups need to be involved in assessment, planning and development phases to identify specific needs and concerns and all potential risks to natural habitats, biodiversity, etc. considered.	Strategies will comply with national laws, vulnerable groups need to be consulted and involved equally and potential risks and impacts of strategies / plans on vulnerable groups, nature, biodiversity, etc. considered.	Although the activity does not entail concrete / infrastructure interventions, it provides the 'base' to plan these for a large area with many inhabitants, which may have impacts on vulnerable groups, nature, etc.
	Output 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and houses and to	Rawalpindi city Nowshera city	Direct: 50	Not relevant	Government officials trained	Representation need to be gender sensitive	

	develop spatial plans						
Component 3 Strengthen national-level capacity to guide / direct city-level development considering climate change and disaster risks and impacts, especially floods and droughts.	Output 3.1. 100 government officials (women men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning tools.	National government	Direct: 100	Not relevant	Government officials trained	Representation need to be gender sensitive	
	Output 3.2. One National urban strategy / plan focused on climate change / disaster risk reduction developed One National guidelines for spatial / urban planning considering climate change / disaster risks developed	National government / whole country		Two national strategies	Needs of vulnerable groups Vulnerable groups need to be involved in assessment, planning and development phases to identify specific needs and concerns and all potential risks to natural habitats, biodiversity, etc. considered.	Strategies will comply to national laws, needs of vulnerable groups need to represented and potential risks and impacts of strategies / plans on vulnerable groups, nature, biodiversity, etc. considered.	Although the activity does not entail concrete / infrastructure interventions, it provides the 'base' to plan these for a large area with many inhabitants, which may have impacts on vulnerable groups, nature, etc.

Risk screening details 15 AF principles

AF principle 1: Compliance with the law

For all proposed activities, relevant rules, regulations and standards and procedures have been identified and procedures to comply to these (see part II.D). During the full proposal development phase, more details will be provided about how all proposed activities comply with national laws.

In line with national standards / requirements (see figure x below), an IEE- Regulation 3 will be conducted / prepared for output 2.1.: Water management, dams, irrigation and flood protection. Dams and reservoirs with storage volume less than 50 million cubic meters of surface area less than 8 square kilometres. Irrigation and drainage projects serving less than 15,000 hectares. Small-scale irrigation systems with total cost less than Rs.50 million.

The IEE will be prepared during the full proposal development phase following Federal government and sectoral guidelines and following steps / processes as described in the 2014 Government of Pakistan and International Union for Conservation of Nature and Natural Resources. Environmental Impact Assessment Handbook for Pakistan.[46]However, it will also assess potential risks and impacts in line with the AF ESP and GP considering the 15 AF principles and potential earthquake and land slide risks. This will be done not only done comprehensively for output 2.1., but also for all other activities.

Figure 20: overview of projects that require an environmental and social impact assessment.

[46]http://cmsdata.iucn.org/downloads/niap___eia_handbook.pdf

Box 3.2: The Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000, Schedule Iand II

Schedule I Requiring IEE- Regulation 3	Schedule II Requiring EIA-Regulation 4
A. Agriculture, Livestock and Fisheries Poultry, livestock, stud and fish farms with total cost more than Rs.10 million. Projects involving repacking, formulation or warehousing of agricultural products	—
B. Energy Hydroelectric power generation less than 50 MW. Thermal power generation less than 200 KW. Transmission lines less than 11 KV, and large distribution projects. Oil and gas transmission systems. Oil and gas extraction projects, including exploration, production, gathering systems, separation and storage. Waste-to-energy generation projects.	**A. Energy** Hydroelectric power generation over 50 MW. Thermal power generation over 200 MW. Transmission lines (11 KV and above) and grid stations. Nuclear power plants. Petroleum refineries.
C. Manufacturing and processing Ceramics and glass units with total cost more than Rs.50 million. Food processing industries including sugar mills, beverages, milk and dairy products, with total cost less than Rs.100 million. Man-made fibres and resin projects with total cost less than Rs.100 million. Manufacturing of apparel, including dyeing and printing, with total cost more than Rs.25 million. Wood products with total cost more than Rs.25 million	**B. Manufacturing and processing** Cement plants. Chemicals projects. Fertilizer plants. Food processing industries including sugar mills, beverages, milk and dairy products, with total cost of Rs.100 million and above. Industrial estates (including export processing zones). Man-made fibres and resin projects with total cost of Rs.100 million and above. Pesticides (manufacture or formulation). Petrochemicals complexes. Synthetic resins, plastics and man-made fibres, paper and paperboard, paper pulping, plastic products, textiles (except apparel), printing and publishing, paints and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs.10 million. Tanning and leather finishing projects.
D. Mining and mineral processing Commercial extraction of sand, gravel, limestone, clay, sulphur and other minerals not included in Schedule II with total cost less than Rs.100 million. Crushing, grinding and separation processes. Smelting plants with total cost less than Rs.50 million.	**C. Mining and mineral processing** Mining and processing of coal, gold, copper, sulphur and precious stones. Mining and processing of major non-ferrous metals, iron and steel rolling. Smelting plants with total cost of Rs.50 million and above.

E. Transport Federal or Provincial highways (except maintenance, rebuilding or reconstruction of existing metalled roads) with total cost less than Rs.50 million. Ports and harbour development for ships less than 500 gross tons.	**D. Transport** Airports. Federal or Provincial highways or major roads (except maintenance, rebuilding or reconstruction of existing roads) with total cost of Rs.50 million and above. Ports and harbour development for ships of 500 gross tons and above. Railway works.
F. Water management, dams, irrigation and flood protection Dams and reservoirs with storage volume less than 50 million cubic meters of surface area less than 8 square kilometres. Irrigation and drainage projects serving less than 15,000 hectares. Small-scale irrigation systems with total cost less than Rs.50 million.	**E. Water management, dams, irrigation and flood protection** Dams and reservoirs with storage volume of 50 million cubic meters and above or surface area of 8 square kilometres and above. Irrigation and drainage projects serving 15,000 hectares and above.
G. Water supply and treatment Water supply schemes and treatment plants with total cost less than Rs.25 million.	**F. Water supply and treatment** Water supply schemes and treatment plants with total cost of Rs.25 million and above.
H. Waste disposal Waste disposal facility for domestic or industrial wastes, with annual capacity of less than 10,000 cubic meters.	**G. Waste Disposal** Waste disposal and/or storage of hazardous or toxic wastes (including landfill sites, incineration of hospital toxic waste). Waste disposal facilities for domestic or industrial wastes, with annual capacity of more than 10,000 cubic meters .
I. Urban development and tourism Housing schemes; Public facilities with significant off-site impacts (e.g. hospital wastes). Urban development projects.	**H. Urban development and tourism** Land use studies and urban plans (large cities) Large-scale tourism development projects with total cost of more than Rs.50 million.
———	**I. Environmentally Sensitive Areas** All projects situated in env. sensitive areas.
J. Other projects Any other project for which filing of an IEE is required by the Federal Agency under sub-regulation (2) of Regulation 5.	**J. Other projects** Any other project for which filing of an EIA is required by the Federal Agency under sub-regulation (2) of Regulation 5. Any other project likely to cause an adverse environmental effect.

Source: 2014 Government of Pakistan and International Union for Conservation of Nature and Natural Resources. Environmental Impact Assessment Handbook for Pakistan.[47]

AF principle 2: Access and equity

The project will ensure that project benefits will be allocated equally and that discrimination nor favouritism in accessing project benefits can take place. This is done through detailed stakeholder mapping, including identification of specific concerns and needs of beneficiaries and specific groups, the development of a specific 'gender' approach and baseline, and to propose measure to avoid unequal access or favouritism. Although the basis for this has been set-up during the concept note development phase, detailed assessments will be conducted during the full proposal development phase, including consultations with vulnerable communities and groups focused on identifying and confirming potential risks and impacts of all proposed activities.

Risk identification at concept note phase: for all proposed project activities, there is a potential risk that project benefits are not allocated equally between beneficiaries. The project will therefore ensure equal representation of vulnerable groups during consultations, planning processes and for possible job opportunities.

AF principle 3: Marginalized and vulnerable groups

The project will ensure that possible adverse impacts of all project activities on marginalized and vulnerable groups are identified and avoided / mitigated. This is done through detailed stakeholder mapping, including identification of specific concerns and needs of beneficiaries and

[47] Idem

specific groups, the development of a specific 'gender' approach and baseline, and to propose mitigation measures, when needed, to reduce the risks. Although the basis for this has been set-up during the concept note development phase, detailed assessments will be conducted during the full proposal development phase, including consultations with vulnerable communities and groups focused on identifying and confirming potential risks and impacts of all proposed activities. All potential adverse impacts will then be identified, taking into consideration the specific needs, limitations, constraints and requirements of each group.

Risk identification at concept note phase: for all proposed project activities, there is a potential risk of adverse impacts on marginalized or vulnerable groups, especially internally displaced and refugee, as well as (undocumented) women and girls (see below). The project will therefore ensure equal representation of vulnerable groups during consultations, planning processes and for possible job opportunities, especially if it comes to water harvesting activities and trainings.

AF principle 4: Human rights

The project will ensure that possible human rights issues relevant to all proposed project activities are addressed. This is done through an identification and analysis of relevant human rights in the special procedures and by making human rights a subject during consultations. Human rights issues have been an explicit part of consultations during the concept note phase (see outcomes consultations in part II.H and annex 1 (especially consultations with ILO, UN Women and OCHA). At the full proposal phase, potential human rights issues relevant to all proposed project activities will also be explicitly part of community and vulnerable groups consultations.

Risk identification at concept note phase: an analysis of potential relevant human rights issues that are identified in the Special Procedures are included below, as well as a description of how the project will address potential risks related to these relevant human rights issues:

According to the Human Rights Council Working Group on the Universal Periodic Review,[48] some challenges related to Human rights still exist in Pakistan: 'In the pursuit of promotion and protection of human rights and fundamental freedoms, the Government continues to face challenges, including among others, combating terrorism, resource constraints, capacity building, awareness raising, effective enforcement of laws and policies, protection of vulnerable groups and natural disasters due to climate change, among others.'[49]

A relevant convention that is not ratified is: The International Convention on the Protection of the Rights of all Migrant Workers and Members of Their Families and the International Convention for the Protection of All Persons from Enforced Disappearance.[50] As mentioned by the Committee on the Elimination of Discrimination against Women[51] there is lack of a national legal framework on refugees and a gender-sensitive approach to address the specific needs and risks of internally displaced and refugee, as well as undocumented, women and girls.

The project will ensure a gender-sensitive approach is taken (see below), especially to address the specific needs and risks of internally displaced and refugee, as well as undocumented, women and girls by ensuring representation throughout the project (see above) and by making

[48] Twenty-eighth session 6–17 November 2017 - National report submitted in accordance with paragraph 5 of the annex to Human Rights Council resolution 16/21* Pakistan. Online: https://documents-dds-ny.un.org/doc/UNDOC/GEN/G17/256/99/PDF/G1725699.pdf?OpenElement

[49] Idem XI. Challenges 78 (page 23)

[50] https://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=131&Lang=EN

[51] Concluding observations on the fourth periodic report of Pakistan, adopted by the Committee at its fifty-fourth session (11 February–1 March2013): https://tbinternet.ohchr.org/_layouts/treatybodyexternal/Download.aspx?symbolno=CEDAW/C/PAK/CO/4&Lang=En

reference to and agreement to comply to – universal human right in all contract and MoUs and AoCs used in the project.

As for output 2.1 there is a potential risk that the area required to construct water harvesting facilities will cover agriculture land or land owned privately. If this is the case, it will be ensured that land owners agree with the intervention and that appropriate compensation is provided. If they don't agree, facilities will not be constructed.

AF principle 5: Gender

The project will ensure that gender equality and women's empowerment is ensured for all project activities. This is done through detailed stakeholder mapping, including identification of specific concerns and needs of women, the development of a specific 'gender' approach and baseline, and to propose mitigation measures, when needed, to reduce the risks. Although the basis for this has been set-up during the concept note development phase (including women focus groups discussions), detailed assessments will be conducted during the full proposal development phase, including consultations with women focused on identifying and confirming potential risks and impacts of all proposed activities. All potential adverse impacts will then be identified, taking into consideration the specific needs, limitations, constraints and requirements of each group.

Risk identification at concept note phase: for all proposed project activities, there is a potential risk of unequal benefits to women. The project will therefore take a specific gender approach for women, children and youth (see below).The project will ensure equal representation of this group during consultations, planning processes and for possible job opportunities. Potential risks mitigation measures include reduce potential risks of violence against women (e.g. by organizing activities in groups) and by promoting women as agents of change, where possible, without risks.

AF principle 6: Core Labour rights

The project will ensure that possible core labour rights issues relevant to all proposed project activities are addressed. This is done through an identification and analysis of relevant national core labour rights and by making core labour rights a subject during consultations. Core labour rights have been an explicit part of consultations during the concept note phase (see outcomes consultations in part II.H and annex 1 (especially consultations with ILO). At the full proposal phase, potential core labour rights issues relevant to all proposed project activities will also be explicitly part of community and vulnerable groups consultations.

Risk identification at concept note phase: The Pakistan government did not ratify all governance and technical conventions and protocols.[52] According to ILO representatives (see part II.H), the project should

- ☐ Ensure safety and health (155 and 187) are guaranteed during activities, especially for women
- ☐ Promoting decent work / livelihood options (skills, protection, diversification) and build upon existing skills

This will be done by making reference to and agreement to comply to – ILO standards, and especially safety and health (155 and 187) in all contract and MoUs and AoCs used in the

[52] http://www.ilo.org/dyn/normlex/en/f?p=1000:11210:0::NO:11210:P11210_COUNTRY_ID:103166

project and by providing required signs and equipment to comply. The project will also promote decent work / livelihood options (skills, protection, diversification) and build upon existing skills through trainings focused on operation and maintenance of water harvesting facilities and housing.

AF principle 7: Indigenous people:

The project will ensure that possible adverse impacts of all project activities on indigenous people (if identified during full proposal phase) are identified and avoided / mitigated. This is done through detailed stakeholder mapping, including identification of specific concerns and needs of indigenous groups, the development of a specific 'gender' approach and baseline, and to propose mitigation measures, when needed, to reduce the risks. Although the basis for this has been set-up during the concept note development phase, detailed assessments will be conducted during the full proposal development phase, including consultations with vulnerable communities and groups focused on identifying and confirming potential risks and impacts of all proposed activities. All potential adverse impacts will then be identified, taking into consideration the specific needs, limitations, constraints and requirements of each group.

Risk identification at concept note phase: the project will ensure all indigenous groups in target areas are identified (if any) during the full proposal phase. At the concept note stage, no indigenous groups have been identified. If specific indigenous groups are identified, the project will therefore ensure equal representation of this group during consultations, planning processes and for possible job opportunities and to give groups to right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use (in line with UNDRIP, and particularly with regard to Free, Prior, Informed Consent (FPIC)). Also, awareness about the rights of indigenous peoples and how it is a general principle in consultation will be raised if indigenous groups are identified. Analysis so far:

- ☐ Sudan is not mentioned by OHCHR[53].

AF principle 8: Involuntary resettlement

The project will ensure physical or economic displacement is avoided for each project activity.

Risk identification at concept note phase: output 2.1., which entails the construction of district / city-level water harvesting facilities in an area close to the target cities. If drainage-related interventions are required, this will only take place in or along existing channels and on public land. More details about land ownership and use, etc. will be provided during the full proposal development phase. Reference to and agreement to comply with human right related to avoiding involuntary resettlement will be made in all contract and MoUs and AoCs. No interventions will take place without the consent of inhabitants in the targeted area.

AF principle 9: Protection of natural habitats

The project will ensure no negative impacts on natural habitats will result from project activities.

Risk identification at concept note phase: which entails the construction of district / city-level water harvesting facilities in an area close to the target cities. No natural habitats have been identified in construction area. However this will be double-checked during the full proposal development phase.

[53] http://www.ohchr.org/EN/Issues/IPeoples/SRIndigenousPeoples/Pages/SRIPeoplesIndex.aspx

AF principle 10: Conservation of biological diversity

The project will ensure no negative impacts on biological diversity will result from project activities.

Risk identification at concept note phase: According to IUCN red list[54] Calomyscus baluchi may live in or around the target area. During the full proposal phase, possible impacts of project activities, especially related to output 2.1.,that may have effects on life in streams and surroundings, potential intervention impacts will be assessed. Under the UNESCO Man and the Biosphere Programme reserve[55], there are no 'biospheres' identified in target areas.

AF principle 11: Climate change

The project will ensure no negative climate change impacts will result from project activities, such as increases in the emissions of greenhouse gasses or in other drivers of climate change.

Risk identification at concept note phase: in line with internationally recognized standards, large interventions in the following sector require a greenhouse gas emissions calculation: energy, transport, heavy industry, building materials, large-scale agriculture, large-scale forest products, and waste management. In line with national standards, environmental and social impact assessments will be conducted for the proposed activities under output 2.1. These assessments will also consider potential greenhouse gas emissions as a result of use of building materials.

AF principle 12: Pollution Prevention and Resource Efficiency
The project will ensure pollution will be prevented and resources will be used efficiently for all project activities.

Risk identification at concept note phase: In line with national standards, environmental and social impact assessments will be conducted for the proposed activities under output 2.1.These assessments will also consider pollution prevention and resource efficiency. In principle the intervention promotes resource efficiency as it has a double function of flood prevention and water supply, thus avoiding multiple infrastructure interventions to establish the same.

AF principle 13: Public health

The project will ensure no negative public health impacts will result from project activities.

Risk identification at concept note phase: In line with national standards, environmental and social impact assessments will be conducted for the proposed activities under output 2.1. These assessments will also consider potential health impacts. To avoid potential negative health impacts for this activity and other activities safety signs and equipment will be provided in line with core labour rights (155 and 187).

AF principle 14: Physical and Cultural Heritage

The project will ensure no negative impacts on heritage sites will result from project activities.

Risk identification at concept note phase: UNESCO identified the following Heritage sites in Pakistan[56]:

[54] http://www.iucnredlist.org/search
[55] http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme
[56] https://whc.unesco.org/en/list/

- ☐ Archaeological Ruins at Moenjodaro
- ☐ Buddhist Ruins of Takht-i-Bahi and Neighbouring City Remains at Sahr-i-Bahlol
- ☐ Taxila
- ☐ Fort and Shalamar Gardens in Lahore
- ☐ Historical Monuments at Makli, Thatta
- ☐ Rohtas Fort

These are not located in the target areas. However, identification of for the communities 'important' buildings in target areas will be part of community and vulnerable groups consultations during the full proposal development phase.

AF principle 15: Lands and Soil Conservation.
The project will ensure no negative impacts lands and soil conservation will result from project activities.

Risk identification at concept note phase: In line with national standards, environmental and social impact assessments will be conducted for the proposed activities under output 2.1. These assessments will also consider potential impacts on lands and soils by identifying fragile soils and valuable lands, if any, and to propose measures to reduce negative effects.

3. Environmental and Social Risks and Impacts Management Plan (ESMP)

To be inserted at full proposal development phase. It will include:

- ☐ Risks management arrangements
- ☐ Risks monitoring and evaluation arrangements
- ☐ Grievance mechanism
- ☐ Overview of potential risks and mitigation measures and monitoring arrangements

4. Gender approach and baseline

Purpose

The purpose of developing a specific gender approach and baseline is to provide an overview of what measures have been taken to ensure that women and men and vulnerable groups will have equal opportunity to build resilience, address their differentiated vulnerabilities and increase their capability to adapt to climate change impacts through project implementation (by providing a baseline with targets). Moreover, it also shows how, in this project, women and youth groups are recognized as "agent of change" in building community resilience.

Project preparation process

An UN-Habitat headquarter gender specialist is involved in the project preparation to ensure compliance with the Gender Policy. The project design and approach are 'gender-responsive' because, during the project preparation phase, gender equality and women's empowerment have been considered during initial data collection focused on issues, needs and perceptions, activity prioritization and the identification and verification of specific 'gender' related risks and impacts. This has been done through desk research, surveys, focus group discussions and community decision-making processes.

Specific steps and considerations

1. <u>Determinants for gender-responsive stakeholder consultation</u>

Focus group discussions with women have been conducted during the concept note development phase, especially to identify specific needs regarding proposed interventions. Focus group consultations with youth, children and migrants are also planned for the full proposal development phase (besides women) to further identify and assess specific needs regarding proposed interventions and possible and perceived risks and, where needed, mitigation measures. Besides that, the following stakeholders have been or will be consulted during the full proposal phase to understand specific gender issues and needs:

Table 21: Stakeholders (to be consulted) for gender approach

Type of stakeholder	Specific stakeholder
National government	To be done during full proposal phase)
UN agencies	UN women, UNIC, UNIDO, UNDP, UNDSS (gender working group) (at concept note proposal development phase)
Community level	Women group in Rawalpindi target communities Women group in Nowshera target communities (to be done during full proposal phase)

See part II.H and annex 1

2. Initial Gender Assessment

The following has been or will be identified / determined:

☐ Data baseline – overview of disaggregated data (beneficiaries) in target areas. Per activities see Part II.C

Table 22: Data baseline – overview of disaggregated data (beneficiaries) in target areas

Population / beneficiaries (Disaggregated)	
Rawalpindi	Nowshera
Total: 155,700 - Female: 47% - < age14: 37% - age 15-24: 21% - age 25-60: 39 % - > age 60: 3% - Disabled: 2% - Some Afghan refugee families	Total: 83,567 - Female: 48% - < age14: 38% - age 15-24: 20% - age 25-60: 40 % - > age 60: 2% - Disabled: 2% - Nowshera district had once sheltered a very large number of Afghan refugees. In recent years it became one of the main areas where IDPs from trouble hit tribal areas and Swat took refuge. However, the exact population of this refugee population in Nowshera Kalan is not known.

☐ Differentiated climate change impacts on men and women and their differentiated capacities do adopt to these, gender division of labour and gender-based power structures.

According to the gender work group and women focus group discussions in Rawalpindi, impacts of floods and climate change related diseases especially affect women (but also children) in a specific way, including:

Flood specific issues:

- ☐ Women being responsible for housekeeping put a lot of effort and time in cleaning their houses whenever they are affected by floodwaters.
- ☐ The monsoon season brings fear and especially women have to stay extra conscious spending sleepless nights.

Disease specific issues:

- ☐ The prevalence of water borne disease and epidemics especially affects younger children. Taking care of them primarily comes to women increasing their burden and affecting their productive time. Disability among children is especially high.

Water scarcity specific issues:

- ☐ Women have to travel almost two kilometers to bring drinking water from two nearby water sources--private boreholes.

- ☐ Analysis of legal status of women in the country/region
    - Consider potential risk of 'violence against women (domestic) and harassment.

- ☐ Analysis of cultural/religious status of women in the country/region
    - Misinterpretation but often dependent on men (also in decision-making), which can be a problem with e.g. rescue work, especially when women are not registered – key challenges: mobility, social norms and mindsets.
    - Women are typically absent from the forum where Disaster Risk Reduction (DRR) decisions / planning is made, so when priorities are established, the interests of women are often poorly represented.

- ☐ Opportunities for promoting a 'women' and 'youth' as agents of change
    - Women are generally water 'handlers' - Train women to use technologies for water harvesting
    - Build the capacities of national and local women's groups' and provide them with a platform to be heard and to lead - Suggest working with national commission 'status of women' and gender focal points within NDMA and departments - Development of a women volunteers team within each community to address women and girls special needs
    - Mainstreaming gender into policy processes, programmes and projects can help ensure that such processes equitably benefit women and men while allowing optimal use of the unique knowledge and skills of women and men.
    - Suggest focussing on skills + capacity development

Figure 21: consultations with women union in Rawalpindi

3. Project planning and design

The following will be further identified / determined during the full proposal development phase:

a. Program goals/objectives and target groups
☐ Key gender goals (to improve gender equality)
☐ Entry points to integrate gender considerations (how to empower women and youth)
☐ Suitable interventions to meet specific needs and built on women skills and knowledge

b. Design of intervention activities:
☐ Promoting an enabling environment for gender equality
☐ Specific roles and needs women (and men) and youth
☐ Involvement women (and men) and youth in activities
☐ Additional activities needed to ensure gender perspective, incl. risk mitigation measures

Table 23: gender baseline, goals and roles

Scale	Disaggregated beneficiaries, gender specific issues and needs (see 2) / baseline	Key goals, entry points and suitable interventions (see 3a)	Specific roles and activities to ensure gender perspective (see 3b), incl. potential risk mitigation measures (see also ESMP)
State / municipal	No clear women focal points in ministries / municipality	Establish focal points	
Focus area / community	Women have strong ties and communicate well	Target especially women, youth for trainings	

(Concrete) intervention	Women are usually water handlers	Include women in planning and execution	

c. Executing entities:
☐ Commitment to gender equality
☐ Capacity building objective

d. Project outputs
☐ Specific for women and youth
☐ Measuring how the environment will enable gender equity

e. Gender responsive indicators
☐ Indicators towards fulfillment of goals / objectives
☐ Gender disaggregated
☐ Targets toward equality

f. Budget
☐ Allocation for mainstreaming?

Table 24: gender perspective, targets, indicators and budget

Component and outputs	Gender perspective selected executing entity (see 3c)	Specific 'gender' targets (when specific 'gender' output) (see 3d and e)	Specific 'gender' Indicators (see 3e)	Budget required and allocated (see 3f)

4. Implementation
- Adaptive management
- Gender expertise and focal points
- Are partner organizations aware
- Sustainability of gender response/on-going engagement of women
- Strategy for capacity building for local women

5. Performance Monitoring and Evaluation
- Gender responsive management response in place, including participatory monitoring?
- Methods, tools and budgets needed to collect 'gender data'?

6. Knowledge Management, Information Sharing and Reporting
- Gender considerations (inequalities, needs, etc.)
- Lessons learnt and best practices

ANNEX 3: Multi-hazard vulnerability matrix

Table 25: District wise monsoon hazard vulnerability matrix - Khyber Pakhtunkhawa province

District	Flood Hazard	Riverine Flood	Flash Flood	Urban Flood	Land Slide	Avalanche	GLOF
Charsadda	Very High	Yes	No	No	No	No	No
D. I. Khan	Very High	Yes	Yes	Yes	No	No	No
Peshawar	Very High	Yes	No	Yes	No	No	No
Shangla	Very High	Yes	Yes	No	Yes	Yes	Yes
Upper Kohistan	High	Yes	Yes	No	Yes	Yes	Yes
Lower Kohistan	High	Yes	Yes	No	Yes	Yes	Yes
Nowshera	High	Yes	Yes	Yes	Yes	No	No
Swat	High	Yes	Yes	No	Yes	Yes	Yes
Tank	High	Yes	Yes	No	No	No	No
Upper Dir	High	Yes	Yes	No	Yes	Yes	Yes
Buner	Medium	No	Yes	No	Yes	Yes	No
Chitral	Medium	Yes	Yes	No	Yes	Yes	Yes
Lower Dir	Medium	Yes	Yes	No	Yes	Yes	No
Malakand	Medium	Yes	Yes	No	Yes	No	No
Mansehra	Medium	Yes	Yes	No	Yes	No	No
Torghar	Medium	Yes	Yes	No	Yes	Yes	No
Mardan	Medium	Yes	No	Yes	No	No	No
Swabi	Medium	Yes	Yes	No	Yes	No	No
Abbotabad	Low	No	Yes	No	Yes	No	No
Bannu	Low	Yes	No	No	No	No	No
Batagram	Low	No	Yes	No	Yes	No	Yes
Hangu	Low	No	Yes	No	No	No	No
Haripur	Low	No	No	No	Yes	No	No
Karak	Low	No	Yes	No	No	No	No
Kohat	Low	No	No	Yes	Yes	No	No
LakkiMarwat	Low	Yes	No	No	No	No	No

Very High	High	Medium	Low	Very Low

Source: National Monsoon Contingency Response Directive 2017 National Disaster Management Authority, Government of Pakistan

Table 26: Pakistan multi-hazard risk index 2018 - Khyber Pakhtunkhawa province

Province	District	Flood	Land Slide	Earthquake	Tsunami	Cyclone	Drought	Avalanche	GLOF	Total Risk
Khyber Pakhtunkhawa	Shangla	5	4	5	0	2	4	5	5	30
Khyber Pakhtunkhawa	Sawat	5	5	4	0	2	2	5	5	28
Khyber Pakhtunkhawa	Upper Dir	4	5	4	0	2	2	4	5	26
Khyber Pakhtunkhawa	Batagram	3	4	4	0	2	3	4	5	25
Khyber Pakhtunkhawa	Mansehra	4	5	4	0	2	1	4	5	25
Khyber Pakhtunkhawa	Buner	5	4	4	0	2	4	4	1	24
Khyber Pakhtunkhawa	Charsadda	5	3	5	0	2	3	5	1	24
Khyber Pakhtunkhawa	Mardan	5	5	5	0	2	1	5	1	24
Khyber Pakhtunkhawa	Nowshera	5	4	5	0	2	3	4	1	24
Khyber Pakhtunkhawa	Abbottabad	3	5	5	0	2	2	5	1	23
Khyber Pakhtunkhawa	Peshawar	5	3	5	0	2	3	4	1	23
Khyber Pakhtunkhawa	Swabi	5	3	5	0	2	2	5	1	23
Khyber Pakhtunkhawa	Lower Dir	4	4	5	0	2	1	5	1	22
Khyber Pakhtunkhawa	Haripur	3	5	4	0	2	1	4	1	20
Khyber Pakhtunkhawa	Kohistan	3	4	3	0	1	1	4	4	20
Khyber Pakhtunkhawa	Malakand	4	3	5	0	2	1	4	1	20
Khyber Pakhtunkhawa	Bannu	4	2	5	0	2	4	1	1	19
Khyber Pakhtunkhawa	Hangu	3	3	4	0	2	3	1	1	17
Khyber Pakhtunkhawa	Chitral	3	4	2	0	1	1	2	3	16
Khyber Pakhtunkhawa	Tank	4	1	3	0	2	4	1	1	16
Khyber Pakhtunkhawa	D. I. Khan	5	1	2	0	2	2	1	1	14
Khyber Pakhtunkhawa	Kohat	3	2	3	0	2	2	1	1	14
Khyber Pakhtunkhawa	Lakki Marwat	3	1	3	0	2	1	1	1	12
Khyber Pakhtunkhawa	Karak	2	2	2	0	1	1	1	1	10

Source: Pakistan Federal Flood Commission

Table 27: District wise monsoon hazard vulnerability matrix - Punjab province

District	Flood Hazard	Riverine Flood	Flash Flood	Urban Flood	Land Slide	Avalanche	GLOF
D. G. Khan	Very High	Yes	Yes	No	No	No	No
Rajanpur	Very High	Yes	Yes	No	No	No	No
Layyah	High	Yes	No	No	No	No	No
Mianwali	High	Yes	Yes	Yes	Yes	No	No
Muzaffargarh	High	Yes	No	No	No	No	No
Rahim Yar Khan	High	Yes	No	No	No	No	No
Bhakkar	Medium	Yes	No	No	No	No	No
Gujranwala	Medium	Yes	No	No	No	No	No
Gujrat	Medium	Yes	No	No	No	No	No
Jhang	Medium	Yes	No	No	No	No	No
Khushab	Medium	Yes	Yes	No	Yes	No	No
Narowal	Medium	Yes	No	No	No	No	No
Rawalpindi	Medium	Yes	Yes	Yes	Yes	No	No
Sheikhupura	Medium	Yes	No	No	No	No	No
Sialkot	Medium	Yes	No	No	No	No	No
Multan	Low	Yes	No	Yes	No	No	No
Sargodha	Low	Yes	No	No	No	No	No
Attock	Very Low	Yes	Yes	No	Yes	No	No
Bahawalnagar	Very Low	Yes	No	No	No	No	No
Bahawalpur	Very Low	Yes	No	No	No	No	No
Chakwal	Very Low	Yes	Yes	No	Yes	No	No
Chiniot	Very Low	Yes	No	No	No	No	No
Faisalabad	Very Low	Yes	No	No	No	No	No
Hafizabad	Very Low	Yes	No	No	No	No	No
Jhelum	Very Low	Yes	Yes	No	No	No	No
Kasur	Very Low	Yes	No	No	No	No	No
Khanewal	Very Low	Yes	No	No	No	No	No
Lahore	Very Low	Yes	No	Yes	No	No	No
Lodhran	Very Low	No	No	No	No	No	No
Mandi Bahauddin	Very Low	Yes	No	No	No	No	No
Nankana Sahib	Very Low	Yes	No	No	No	No	No
Okara	Very Low	Yes	No	No	No	No	No
Pakpattan	Very Low	Yes	No	No	No	No	No
Sahiwal	Very Low	Yes	No	No	No	No	No
Toba Tek Singh	Very Low	Yes	No	No	No	No	No
Vehari	Very Low	No	No	No	No	No	No

Very High	High	Medium	Low	Very Low

Source: National Monsoon Contingency Response Directive 2017 National Disaster Management Authority, Government of Pakistan

Table 28: Federal Flood Commission risk index 2018 - Punjab province

Province	District	Flood	Land Slide	Earthquake	Tsunami	Cyclone	Drought	Avalanche	GLOF	Total Risk
Punjab	Rawalpindi	4	5	5	0	2	3	1	1	21
Punjab	Sheikhupura	5	2	4	0	2	4	1	1	19
Punjab	Multan	4	1	4	0	2	5	1	1	18
Punjab	Rahim Yar Khan	5	1	3	0	2	5	1	1	18
Punjab	Gujranwala	5	2	4	0	2	2	1	1	17
Punjab	Gujrat	5	2	5	0	2	1	1	1	17
Punjab	Mianwali	4	4	3	0	2	2	1	1	17
Punjab	Muzaffargarh	5	1	3	0	2	4	1	1	17
Punjab	Okara	3	1	5	0	2	4	1	1	17
Punjab	Nankana Sahib	3	2	4	0	2	4	1	1	17
Punjab	Faisalabad	3	1	4	0	2	4	1	1	16
Punjab	Jhang	5	1	3	0	2	3	1	1	16
Punjab	Narowal	5	1	5	0	2	1	1	1	16
Punjab	Sahiwal	3	1	4	0	2	4	1	1	16
Punjab	Sialkot	5	1	5	0	2	1	1	1	16
Punjab	Toba Tek Singh	3	1	4	0	2	4	1	1	16
Punjab	Jhelum	3	2	4	0	2	2	1	1	15
Punjab	Kasur	3	1	4	0	2	3	1	1	15
Punjab	Khanewal	3	1	3	0	2	4	1	1	15
Punjab	Khushab	4	2	3	0	2	2	1	1	15
Punjab	Leiah	5	1	2	0	2	3	1	1	15
Punjab	Lodhran	3	1	3	0	2	4	1	1	15
Punjab	D. G. Khan	5	1	2	0	2	3	1	1	15
Punjab	Sargodha	4	2	3	0	2	2	1	1	15
Punjab	Rajanpur	5	1	2	0	2	3	1	1	15
Punjab	Lahore	3	1	4	0	2	2	1	1	14
Punjab	Mandi Bahauddin	3	1	4	0	2	2	1	1	14
Punjab	Pakpattan	3	1	3	0	2	3	1	1	14
Punjab	Vehari	3	1	3	0	2	3	1	1	14
Punjab	Chiniot	3	1	3	0	2	3	1	1	14
Punjab	Bahawalnagar	3	1	2	0	2	3	1	1	13
Punjab	Hafizabad	3	1	3	0	2	2	1	1	13
Punjab	Bahawalpur	2	1	2	0	2	3	1	1	12
Punjab	Attock	2	2	3	0	1	1	1	1	11
Punjab	Chakwal	2	1	3	0	1	2	1	1	11
Punjab	Bhakkar	3	1	2	0	1	1	1	1	10

Source: Pakistan Federal Flood Commission

ANNEX 4: water harvesting and drinking water cleaning techniques and approach

Selection of households: A multi-indicator criteria for selection of households will be employed. It will be chalked out in consultation with target communities while taking technical input from water harvesting experts whose services will be hired by the project. At this stage, the broader framework for this selection criteria is outlined below:

- Relative poverty and vulnerability of households, including informal status, lack of access to water or dependence on boreholes
- Households with larger number of members to benefit maximum population
- Suitability of housing structure for a water harvesting system
- Willingness of household to participate in the program and use and maintenance of harvesting system
- Willingness and ability to extend/share technical knowledge/experience with
- other households/community members

Other households facing similar issues: The project will evolve a community based participatory technology development system encouraging wider communities to participate in development or adaption/localization of water harvesting and purification technologies. This wider engagement, as has been evidenced by various examples, will contribute to freer knowledge flow and its adoption. Likewise, the project staff will provide technical support/backstopping to all households in target areas willing to benefit from these technologies. The project will also work to make these technologies affordable to maximum number of households while developing an effective business model that could create markets for these technologies.

The proposed technology:
Rainwater harvesting is a proven technology as in Pakistan as UN Habitat has already introduced rain water harvesting technologies in a number of projects in water scarce areas in AJK, Khyber Pakhtunkhwa and Part of Rawalpindi District .

However, the water harvesting technologies mentioned/given example of in the concept note/proposal is not being used in the target areas. Currently, as shown by community consultations, even household or community level rainwater harvesting concepts are hardly heard of. However there exist promising opportunities for introduction and adoption of rainwater harvesting in these areas. For instance as Pakistan had to undergo worst episode of electricity shortage, the solar systems for electricity generation have made their way even in poorer households as a sustainable alternative for energy supply.

Scaling up of successful interventions: At this stage following strategy is proposed in this regard:

- The knowledge management system to be developed for this project will ensure a regular documentation of project's experiences and availability of this knowledge in form of communicative case studies, guidelines, operational manuals, frameworks, pictorial presentations and info-graphs. All these be available in public domain mainly through social media and dedicated project website.
- Technical support/backstopping will be provided to all concerned for replication of successful experiences, also through women saving groups
- Lobbying for incorporation of project's learning into existing and new building byelaws/codes, urban development policies and plans and spatial strategies; disaster risk reduction and climate change policies and plans at various tiers of government.

Business Model for water harvesting and purification technologies:

- Technology development and improvement/adjustment in a participatory manner

- Developing local markets for water harvesting and purification technologies and creating business opportunities for skills and products.
- Advertising technologies and their benefits in culturally appropriate and attractive manner.
- Making technologies and technicians available in local markets through training, awareness and technical backstopping.
- Manufacturing of technologies/components at local level

Water Purification: Besides scarcity, water contamination is a severe issue in the target areas. Hence the introduction of wider availability of water purification technologies is a genuine need. Certain purification technologies are already in use. However, as community consultations reveal, these technologies are not affordable especially for poor households. To address this situation, the project will introduce affordable but effective water purification technologies taking due guidance from successful experiences from around the world. Side by side, the community mobilization and technical support will contribute in developing a culture of hygiene and safer use of drinking water which in turn will contribute to sustainability of the technologies.

RWH best practices

1. **Singapore:** The Republic of Singapore has a land area of 61,000 hectors. Water availability is poor. In spite of 50 per cent of land area being used as a water catchment area, almost 40-50 per cent of water requirements are imported. After considerable research and development, schemes of abstraction of ground water in Singapore include utilisation roofs of high rise buildings, use of run-off from airports for non-potable uses, integrated systems using combined run-off from industrial complexes, aquaculture farms and educational institutions.

-

- A recent study of an urban residential area of about 742 ha used a model to determine the optimal storage volume of the rooftop cisterns, taking into consideration non-potable water demand and actual rainfall at 15-minute intervals. This study demonstrated an effective saving of four per cent of the water used, the volume of which did not have to be pumped from the ground floor. As a result of savings in terms of water, energy costs, and deferred capital, the cost of collected roof water was calculated to be S$ 0.96 against the previous cost of S$1.17 per cubic metre. The catchment areas, under utilisation, are relatively clean and as a result the raw waters are of good quality. Singapore has earmarked specific locations where pollution-contributing activities are prohibited. The growing need of water led to the establishment of Lower Seletar-Bedak Water Scheme in 1986. Control of Water Pollution and relevant technologies were the main priorities in the said scheme. Control of water pollution required great inter-departmental coordination which included government and quasi-government groups.

-

- Besides interdepartmental planning for controlling water pollution, there are other important factors to be considered in the overall planning of such systems which include: hydrological simulation, water quality, trapping urban run-off, sediment removal etc. It has been established in Singapore that the utilisation of urban catchments is a reality that can be highly efficient if the system is well-planned and maintained. Additional research and development will help to optimise the reliable yield from such catchments and make the multiple uses of such catchments a truly working proposition.

-

- A marginally larger rainwater harvesting and utilisation system exists in the Changi Airport. Rainfall from the runways and the surrounding green areas is diverted to two impounding reservoirs. One of the reservoirs is designed to balance the flows during the coincident high runoffs and incoming tides, and the other reservoir is used to collect the runoff.

The water is used primarily for non-potable functions such fire-fighting drills and toilet flushing. Such collected and treated water accounts for 28 per cent to 33 per cent of the total water used, resulting in savings of approximately S$ 390,000 per annum.

-

- The experience of Singapore shows that the concept of utilising small catchments has to be accepted. The system of rainwater harvesting can be adopted in all the airports. The airports can provide both larger surface run-off and roof water. For utilising urban catchments there is a need for proper coordination among various departments. This is very important to monitor qualitative and quantitative characteristics of the raw water.

-

2. **China's Gansu Province:** Gansu Province lies on the Loess Plateau in central China and is one of the driest and poorest areas of the country with annual per capita incomes of around US $70-80 in rural areas. Traditionally, people have depended on rainwater as their main source of water supply, excavating 20m3 clay lined underground cisterns in the loses (check word) soil for storing surface runoff. In dry years, however, these could not always provide sufficient water and people were forced to trek long distances to rivers or to depend on government water trucks. In 1995, the region suffered its worst drought in 60 years. In response the Gansu Research Institute for Water Conservancy with the support of the Provincial Government launched the 1-2-1 project which was based on test trials, demonstrations and pilot projects carried out since 1988.

-

- The 1-2-1 projects were so named because each family was provided with one clay tiled roof catchment area, two upgraded cement water cellars and plastic sheeting for concentrating rainwater runoff on one field. Traditional clay lined water cellars (*Shuijiao*) were upgraded by lining them with cement or concrete and small metal pumps were also attached. Proper tiled roof catchments and cemented courtyards replaced the bare earth catchments and strong plastic sheeting was placed over the rills on fields to concentrate runoff onto crops. Some households also used spare plastic sheeting to construct temporary greenhouses using wooden frames. A trench dug around these was used to collect any rainwater for watering the vegetables being produced.

-

- Using these simple, effective yet inexpensive approaches, the project assisted over 200,000 families in 1995-1996 and ensured that around one million people were provided not only with sufficient water but also with food and through the production of cash crops some limited income. For a total cost of around US $12 million, half provided by the local government and half by community donations, the recipient families acquired upgraded water supplies and supplementary irrigation. The provision of labour and locally available materials by the community ensured that the total implementation cost for the project amounted to just US $12 per capita.

- **Changi Airport, Singapore**

- A marginally larger rainwater harvesting and utilisation system exists in the Changi Airport. Rainfall from the runways and the surrounding green areas is diverted to two impounding reservoirs. One of the reservoirs is designed to balance the flows during the coincident high runoffs and incoming tides, and the other reservoir is used to collect the runoff. The water is used primarily for non-potable functions such fire-fighting drills and toilet flushing. Such collected and treated water accounts for 28 per cent to 33 per cent of the total water used, resulting in savings of approximately S$ 390,000 per annum.

-

- The experience of Singapore shows that the concept of utilising small catchments has to be accepted. The system of rainwater harvesting can be adopted in all the airports. The airports can provide both larger surface run-off and roof water. For utilising urban catchments there is a

need for proper coordination among various departments. This is very important to monitor qualitative and quantitative characteristics of the raw water.

- **Rainwater Harvesting in Indore:** The water supply to the town of Indore is 168 million litres per day as against the daily requirement of 320 million litres. A declining rainfall and the growing population has resulted in the gap increasing between demand and supply. This gap between demand and supply is met through tapping groundwater. As a result, the groundwater table is rapidly declining. Energised pumps are working overtime to meet water needs. Thus, when it comes to overexploitation of groundwater, Indore's story is no different from other big and small towns across India.
-
- What is different is the effort of the people to harvest rains. The Indore Municipal Corporation (IMC) and the city Mayor with the help of some media groups are involved in raising awareness and implementing rainwater harvesting. But rather than just complain, residents of the town are taking the matter into their own hands and are trying to alleviate the problem. Efforts to raise the groundwater level in the area have started through rainwater harvesting programmes. Infact, the proprietors of *Nai Duniya*, a newspaper group, agreed to deposit in a *Nai Duniya Seva* Trust a sum of five paise from each of the 1,30,000 newspaper copies sold everyday. So far, about Rs 75 lakh have been collected and will be used for development projects.
-
- A rebate of six per cent on property tax has been announced for those who install rainwater harvesting in their house, bungalow or building. Three committees – technical, education and execution committees were set up by the Indore Municipal Corporation (IMC) for this purpose – the first of its kind in the country. For construction of new buildings on areas more than 250 square metres in size, rainwater harvesting is now compulsory. The Corporation has proposed to make rainwater harvesting mandatory for the existing buildings

Rain Water Harvesting planning and procedure Pakistan

To utilize the resources with less expenditure prior planning is the requisite of any project and is same for the rain water harvesting rather more than for Rural Housing, because owner will directly bear the money may be in most of the cases he will cut the food and other necessary budget and use for rain water collection.

Planning; check the house for potential harvesting of rain water.
Storage available, or anticipated. Obstruction/intervention like projections, intended extension and etc.
Decision of collection point; this is the most important point to be considered prior to gutter fixing. It is better to have one collection point for a single house, but seldom it is feasible to have one point collection especially for big and complex shaped houses. it will have extra initial and maintenance cost.

Initially people will use potable storage tanks, but in future they will construct tanks, when ever they will have money and spare time. So this is very important to consider land for permanent collection point if feasible.

Step by step procedure;

Mark the level at eve boarding and tie the string at mark point. This will give overview of slop and direction of flow.

In old houses or poor carpentry work roof edge is not in straight line. This will interrupt water flow.

This point at roof is 2'' humped and needs readjusting .

This point is 3'' because of bending of purlin.

Readjustment.

Taking out nails;

Use claw hammer and any round handle thicker than rise of corrugation, this will prevent damaging corrugations.

Cutting and molding gutter.

For house 2''x 2'' gutter is sufficient. This will give more cross sectional area upon fixing.
1 Nails are fixed 4'' away from sheet edge (this is standardize practice of carpenters).
2 Sheet width is 3' or 4ft available in market.
3 There always irregularities can be in roof fixing.
4 There should be minimum 2'' gap between sheet and gutter edge to prevent blockade between contact point.
Keeping all these factors; it is recommended to use 18'' wide sheet for gutter(2 piece per sheet of 3ft wide).

Cut the sheets in 10 ft piece.(10 ft gutter is easier to mould and fix)

Cut the sheet in two equal halves keeping line staright.

Making mould (Furma).

Use 2 nos 4''X 4'' battens, with defined sharp edges. Tie them with cross ties strongly, leaving 2-1/8'' gap.(length8-10ft).

Turn over this, this is ready for use.

In this case wood was short in length, therefore additional piece were joined. It is better to have one long (10ft)

Place one purlin 2''x2''. It will determine depth. In this case 2'' depth was required, and 4'' deep batten were used therefore 2'' purlin would be placed.

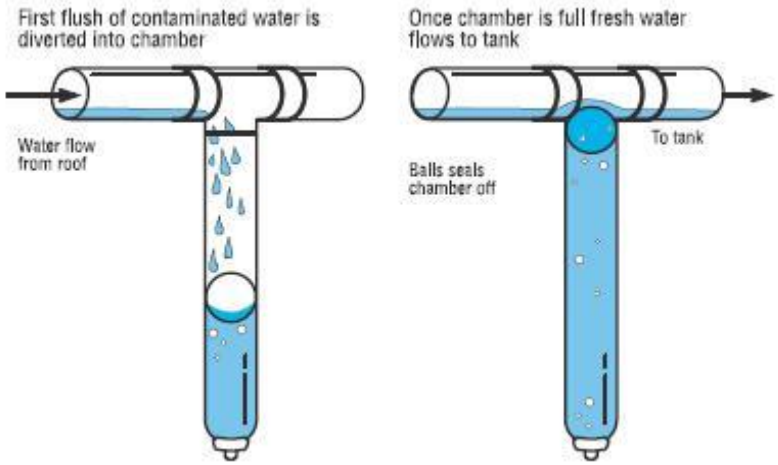
Mark the sheet. 10'' and palce in mould as shown.

Picture of marking to be readied.

Removing Contaminants from Collected Rainwater

Rainwater falls free of contaminants from the sky, so as long as your roof is not covered in debris, the water can be used untreated in your garden. It is however best to use a so called **first flush device** to filter out any bird droppings, leaves, and dust etc that would otherwise fester in the water you save if you intend to collect a lot of **rainwater** and store it for long periods of time.

Undesirables tend to appear in the **first flush** of water coming down the down pipe from the roof when it starts to rain, and so for a large rooftop **rainwater harvesting system** that stores a lot of rainwater, the first fixed volume of rain collected should be diverted away from your clean water tank. If one gallon of water is diverted away for each 100 square feet of roof area, the water subsequently collected will be essentially free of debris and contaminants.



Grey water

As well as collecting rainwater it is also possible to collect and reuse **grey water** such as old bath water, water from the washing machine, and so on. This can be treated and used to irrigate plants in the garden helping you to save water.

FIRST FLUSH SYSTEM RAINWATER HARVESTING

Find out how dirt is kept out of rainwater harvesting tanks

There are two basic types of system employed to keep **harvested rainwater** clean. The first uses a filtration and settling tanks to prevent objects above a certain size getting through to the storage tank. Unfortunately these systems need to be regularly cleaned to prevent blockages forming, and not all dirt and bacteria can be filtered out. Therefore, in this article we will discuss basic **first flush systems**.

What is a First Flush System?

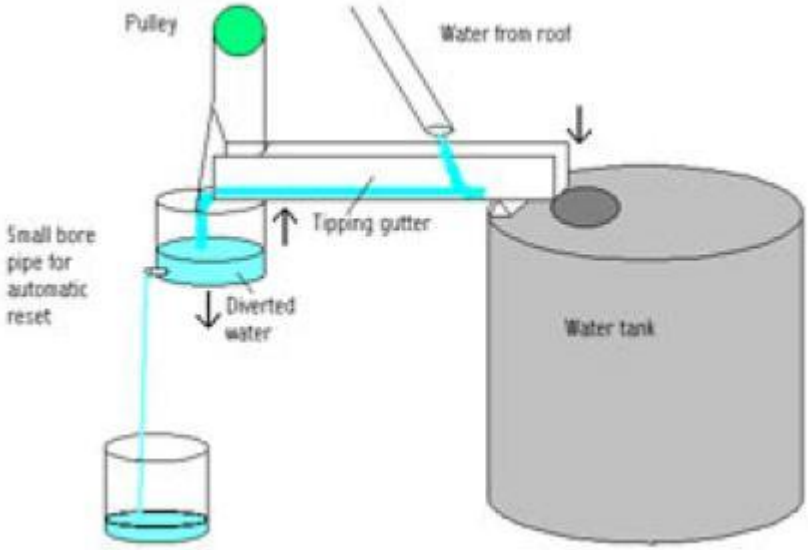
In a typical **rainwater harvesting system** rainwater is collected that lands on a roof and is then channeled down through guttering and pipe work to a storage tank. During dry periods of weather the roof gets covered in a fine coating of dust together with leaves, bird droppings, and other debris. When it starts to rain these objects are washed straight off the roof and down the guttering. After a certain quantity of rain has fallen the loose dirt and debris is virtually all washed away and the water coming down the pipe can be assumed to be *clean*.

A **First Flush System** dumps the water that comes down the pipe first since it may be contaminated, and only when the rainwater coming down the pipe is clean does it get directed into the storage tank.

Example of First Flush Systems

First flush systems are available commercially, but DIY systems can be put together using easily and cheaply available parts. The two commonest systems use either a **floating ball** or a **tipping gutter** to divert and/or store the first flush away from the storage tank.

Tipping Gutter First Flush System

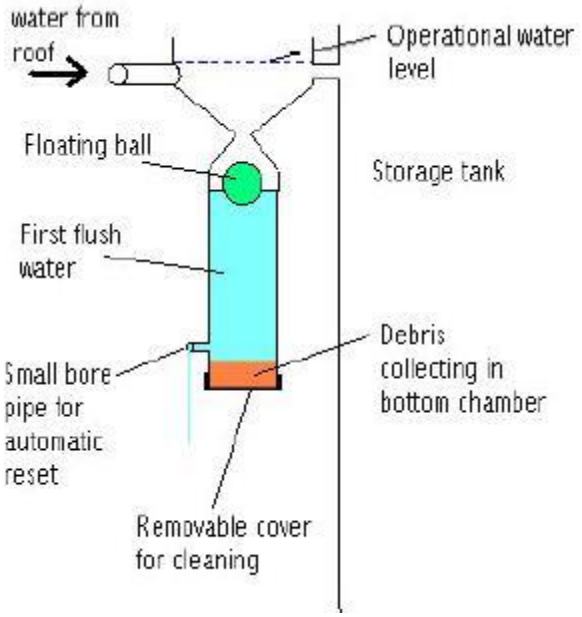


The **tipping gutter first flush system** (pictured above) is very simple to build, operate, and maintain. Water from the roof lands on a piece of guttering which is tipped down away from the water tank. Therefore the first rains and their debris pour away from the tank and into a storage vessel. The end of the guttering is attached via a pulley to the diverted water tank, and so as the diverted water tank gets fuller (and therefore heavier) it lifts up the end of the tipping gutter. Now the (hopefully) clean water from the roof is directed into the water tank.

The diverted water tank has a small bore pipe fitted near its bottom out of which the accumulated diverted water can escape. Over time the dirty water will leak out and the tipping gutter will reset ready for the next rain shower. Obviously if it is still raining by the time the diverted water tank has emptied, some water will be lost as the diverted water tank will have to be filled up again (this time with clean rainwater) before water is again allowed into the water tank.

A small amount of wastage is more than made up for by the simplicity and elegance of this first flush system. However, if water really is in very short supply then a tap can be fitted to the diverted water tank so that the dirty water can be released manually when the rain has stopped. This saves waste, however if the system is to be left for a few weeks unattended, contaminated water would get into the main clean water storage tank if it rained.

Floating Ball First Flush System



The **floating ball first flush** system (pictured above) is a little more complicated than the tipping gutter system discussed above although they have some similarities. When the rain starts to fall it accumulates together with any debris in a chamber with a conical top. As the chamber fills a ball floats on the collected water's surface. Eventually the ball becomes stuck in the conical chamber entrance blocking the bottom chamber and therefore redirecting subsequent collected rainwater into the main clean water storage tank.

As with the tipping gutter system, a small bore pipe is used to slowly drain the water from the lower chamber to automatically *reset* the first flush device. Again a tap can be used if water is at a premium since water dribbles out continuously when it is raining.

Setting Up a First Flush System

Every roof and every location is different. Basically, the larger the roof and the longer the periods between rain fall, the larger the quantity of water which must be disposed of in the first flush. In the case of the **tipping gutter system** this is achieved by using a suitably large diverted water tank and weighting the gutter to ensure that it tips when the required amount of water has been diverted. Again with the **floating ball system**, the bottom chamber of the first flush tank must be sized appropriately so that rainwater is only allowed into the storage tank after the first flush has been collected.