



## **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  
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ADAPTATION FUND

## PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

### PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera, Pakistan
Country:	Pakistan
Type of Implementing Entity:	Multilateral
Implementing Entity:	United Nations Human Settlements Programme
Executing Entities:	National level: <ul style="list-style-type: none"><li>- Ministry of Climate Change – through establishment of PMU; NDMA</li><li>- Ministry of Water Resources</li></ul> Local level: <ul style="list-style-type: none"><li>- Concerned provincial and district departments including Provincial and district disaster management authorities</li><li>- Municipal Corporation Rawalpindi and Municipal Committee/Tehsil Municipal Administration Nowshera</li></ul> Community level: <ul style="list-style-type: none"><li>- SheherSaaz NGO</li><li>- Concerned Union Councils/administration</li><li>- Community based organizations and citizen groups in target communities</li></ul>
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.<sup>1</sup> Therefore, the government of Pakistan (through the AF designated authority) requested UN-Habitat to align project objectives and targets with government priorities, especially those in the new National Water Policy (2018) and National Flood Protection Plan (2016).<sup>2</sup> Even though flood impacts and drought / water scarcity issues are often particularly severe in high density (i.e. urban) areas,<sup>3</sup> 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.

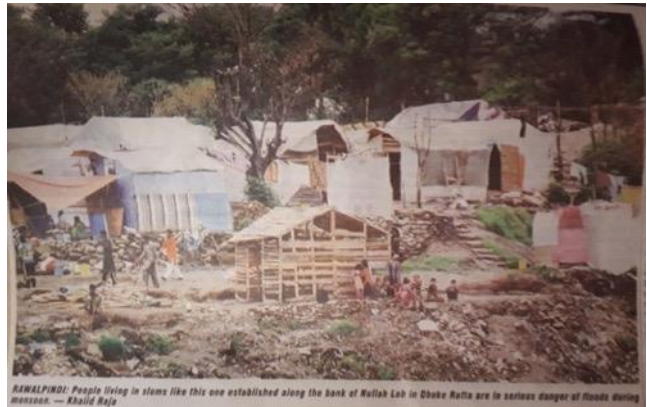


Figure 1: News article July 2018. Heading: Rawalpindi: People living in slums like this one established along the banks of Nullah Let in Dhoke Ratta are in serious danger of floods during monsoon.

Recurring floods trigger damages not only to the lives of individuals and destroy infrastructure but also makes most of the drinking and irrigation water sources unusable. Intensification of unplanned urban sprawl increased encroachment of river banks like River Kabul. This also causes overflow of natural channels and leads to inundation of surrounding settlements, which severely affects informal settlements as being the most poor and vulnerable to climate change impacts. Tube wells get submerged and make it difficult for the flood affected population to find potable and safe water from tube wells/boreholes for drinking and other domestic purposes. As the majority of the population of these areas is reliant on the consumption of groundwater from the wells for drinking, cooking, preparation of food, washing clothes and utensils, hygiene and sanitation purposes, the need of safe and clean water in these areas is very immediate.

While water scarcity is increasing due to increase of droughts and melting glaciers (see table 3) there is also a relationship between floods and water scarcity issues, especially in urban areas: floods contaminate groundwater (100 feet depth) and thus affect people dependent on water pumps, because flood water enters these pumps and boreholes (see figure 11). This flood water is often contaminated because of overflowing drainage channels clogged by waste. The urban poor are the most affected as they cannot afford deeper boreholes of minimum 300 feet depth, nor will such boreholes be flood-resilient. Additionally, contamination of groundwater is a source for water-borne diseases affecting mostly children, elderly and women who are mostly in charge of fetching water.

Additionally, people are experiencing contamination of groundwater due to extensive flooding. The surface runoff created by heavy floods, picks up natural and man-made contaminants of

<sup>1</sup> See [section D](#) (analysis of national priorities / strategies and [section H](#) (outcomes consultations with government stakeholders).

<sup>2</sup> Idem

<sup>3</sup> 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.

unsafe concentrations. It also washes toxic materials and chemicals from industrial effluents, pesticides and fertilizers that are used for crop production. These contaminants end up in groundwater or deposit into watersheds and subterranean rivers and pollute the whole aquifer and freshwater sources making it unsuitable for domestic use. Field visit and consultations have revealed (table 6 and 7) that groundwater in 100 feet depth is not safe for consumption anymore.

Further studies revealed a high risk of groundwater pollution by solid waste and subsequent influence on surface-water quality. Waste disposal sites seriously affect local wells and boreholes used for public water supply. Contaminants from municipal solid waste landfills, improperly disposed domestic waste and open waste burning became a major significant source of contamination to groundwater and surface waters.

Groundwater contamination is considered a long-term problem because contamination persists in aquifers for decades without treatment while contaminated groundwater travels; thus, the contaminants can persist for a long time in the groundwater environment.

A study conducted by PCRWR revealed that 89% of the groundwater in Pakistan is below the recommended safe standards for human consumption. As most of the population in flood affected areas is reliant on groundwater from wells, the lack of the safe drinking water management practices in these areas specified the urgent need to ascertain if the water supply is suitable for human drinking purposes and for other domestic uses and whether it satisfies WHO guidelines.

Water harvesting initiatives in Pakistan are very limited, techniques not well developed and the link with reducing flood impacts has not been made, even though flood and drought / water scarcity issues are the main climate change related concerns in Pakistan. Therefore, taking an approach that tackles these issues is not only cost-effective but also required in an urban context.

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 address water scarcity issues in a flood-resilient manner. Innovative techniques will be used to do this. Additionally, community plans and district/city level spatial strategies will be developed to manage climate change-related risks and impacts beyond city boundaries taking multiple sectors into account.

### **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.<sup>4</sup> 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 accounting for 36 percent of the total population. In coming years this trend is set to continue.<sup>5</sup>

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<sup>4</sup> [https://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](https://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)

<sup>5</sup> Pakistan's intended nationally determined contribution (PAK-INDC), p7

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.<sup>6</sup> The Economic Survey 2018<sup>7</sup> revealed 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 percent of the population working poor at PPP \$3.10 a day (% of total employment).

Figure 2: Incidence of poverty by district

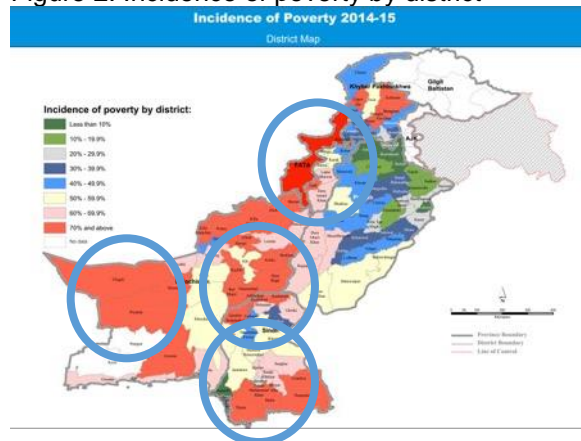
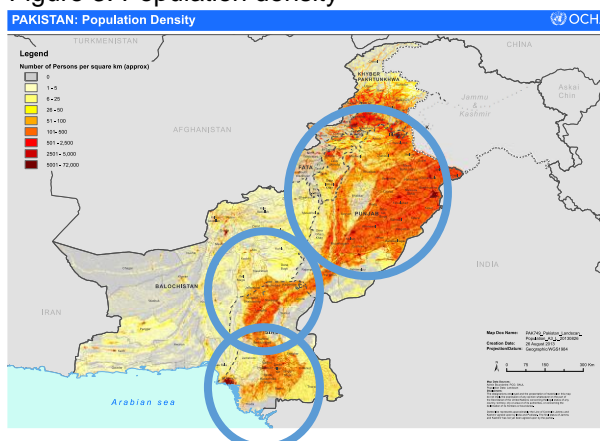


Figure 3: Population density



**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 in 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.<sup>8</sup> This classifies 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.<sup>9</sup>

**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

<sup>6</sup> <http://hdr.undp.org/en/countries/profiles/PAK>

<sup>7</sup> <https://profit.pakistantoday.com.pk/2018/04/26/pakistans-percentage-of-people-living-below-poverty-line-falls-to-24-3-percent-economic-survey-2018/>

<sup>8</sup> <https://data.worldbank.org/country/pakistan>

<sup>9</sup> Pakistan's intended nationally determined contribution (PAK-INDC), p7

and related services and infrastructure. This resulted in monetary losses of over US\$ 18 billion as shown by the devastating impacts of the floods between 2010-2014.

## **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 Sustainable Development Goals (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 years<sup>10</sup>, 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.'<sup>11</sup>

In Pakistan, more than 70 percent of the drinking water relies on groundwater aquifers.<sup>12</sup> Floods in various regions of Pakistan leads to the deterioration of the groundwater quality by destructing the underground sanitary and sewage system, which leads to the contamination of the groundwater with sewage. A large number of studies revealed that the drinking water in flood-affected areas contains a high load of bacterial contaminants.<sup>13</sup> For example, various studies showed that the catastrophic floods in Pakistan in 2010 severely devastated the groundwater quality. It was reported that the groundwater was contaminated with high concentrations of diverse microbes, such as *E. coli*, Fecal coliform, total coliform, Shigalla, Salmonella, Staphylococcus aureus, *V. cholera*, *P. aeruginosa*, and *S. aureus* in Peshawar, Swat, Sukkur.<sup>14</sup> 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 informal areas and in a climate sensitive way. In particular, the impacts of floods and droughts on basic services, including water scarcity and contamination, need to be addressed in

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<sup>10</sup> Pakistan National Human Development Report, 2018; UNDP Pakistan

<sup>11</sup> Pakistan's intended nationally determined contribution (PAK-INDC), p5

<sup>12</sup> Tahir, M. A., Chandio, B. A., Abdullah, M., and Rashid, A. (1998), Drinking water quality monitoring in the rural areas of Rawalpindi.

<sup>13</sup> Tariq Usman Saeed and Haleema Attaullah (2014), Impact of Extreme Floods on Groundwater Quality (in Pakistan).

<sup>14</sup> Maimoona Raza, Fida Hussain, Jin-Yong Lee and Muhammad Bilal Shakoor (2017), Groundwater status in Pakistan: A review of contamination, health risks, and potential needs.

order for poor communities to escape poverty and reduce disease related to 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. Lack of woods as retainer for rainwater increases the risks for flooding. The same accounts for coastal ecosystems. Climate change will exacerbate this and also other extreme weather risks. The severe flood, resulting from heavy monsoon rains during the four-day wet spell from 27 to 30 July 2010 with heavy rainfall of more than 200mm (7.9 in), broke a long standing, 100 years record flood in early 1900s and rapidly became devastating for the province of Khyber Pakhtunkhwa and Punjab.

### **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.<sup>15</sup>

### 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. Annual precipitation has historically shown high variability but has slightly increased in the last 50 years.

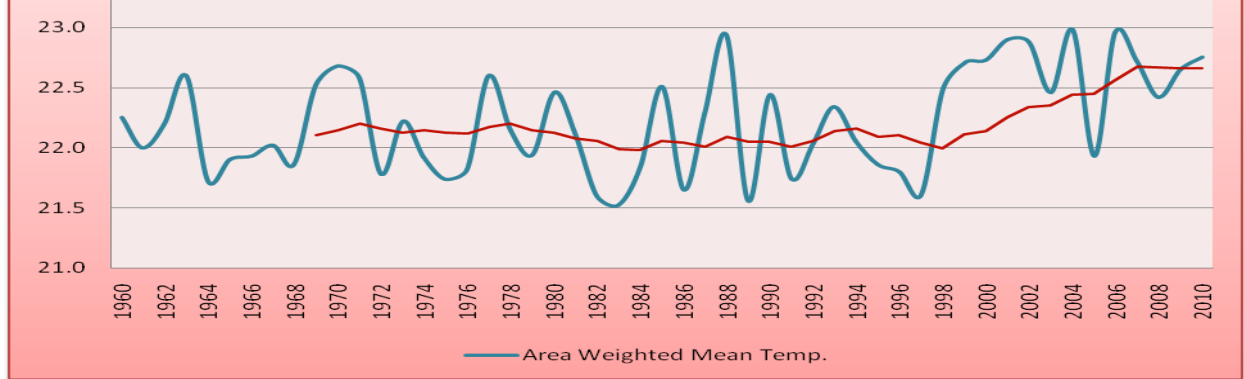
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<sup>15</sup> <https://germanwatch.org/en/download/20432.pdf>



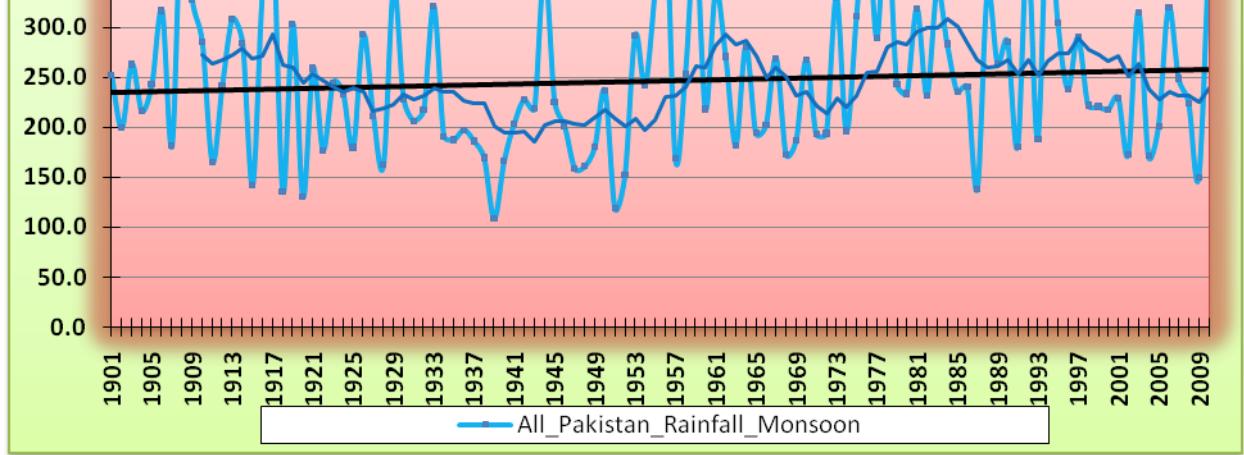
Sea level along the Karachi coast has risen approximately 10 centimetres in the last century.<sup>16</sup>

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.

<sup>16</sup> 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 Ketī Bander and the Indus River delta.'<sup>17</sup>

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.<sup>18</sup>

### 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.'<sup>19</sup>

<sup>17</sup> Idem

<sup>18</sup> Government of Pakistan (2013, p5) Framework for implementation of climate change policy

<sup>19</sup> 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	<b>Water:</b> Increased water demand due to frequent heat waves; wide-spread 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. Increased groundwater pollution due to extreme floods blending contaminated water run-off and overflowing drainage/ channels with freshwater sources.
Warm spells/ heat waves, frequency increase over most areas.	Very likely	<b>Agriculture:</b> 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.  <b>Energy:</b> Increased energy demand because of higher temperatures. Decreased hydropower potential due to reduced water availability in long term.  <b>Human Health:</b> 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.  <b>Ecosystem:</b> 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.
Heavy precipitation events, frequency increased over most areas.	Very likely	
Areas affected by drought increase.	Likely	
Increased incidence of extreme high sea level.	Likely	

### Specific water availability concerns and vulnerabilities

'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).'<sup>20</sup>

Some specific issues concerning the water sector are:<sup>21</sup>

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

<sup>20</sup> National water policy (2018, p 1)

<sup>21</sup> National water policy (2018, p 3-4)

- ❑ 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 groundwater 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:<sup>22</sup>

'In 2010, Pakistan was hit by one of the worst natural disasters - floodwaters inundated 38,600 km<sup>2</sup> 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 made nearly half the cumulative total damages in the last 60 years.

Figure 6: Combined flood and drought hazard risk map

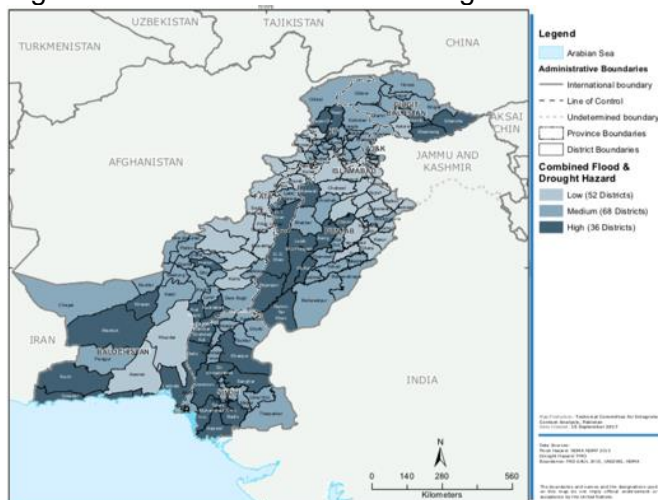


Figure 7: Rivers of Pakistan



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<sup>23</sup> 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.

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.

<sup>22</sup> National flood protection plan (2016)

<sup>23</sup> National flood protection plan (2016, p 3)

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<sup>24</sup>, 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.

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<sup>24</sup> 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

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

Year	Direct Losses (US\$ million) 1US\$=86PKRs	Lost Lives (number)	Affected Villages (number)	Flooded Area (km <sup>2</sup> )
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 <sup>a</sup>
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.

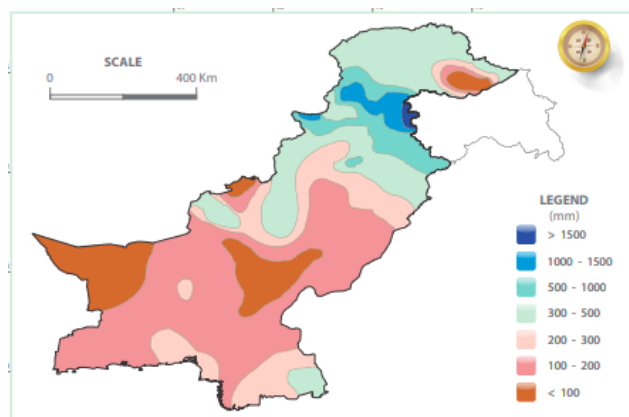


Figure 8: Rainfall in Pakistan

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 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 is reducing due to climate change.

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.

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



Figure 9: Lai Nallah in Rawalpindi



recommended by the national government that a permanent solution of the problem must be evolved as early as possible.<sup>25</sup>

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 has been taken by the concerned authorities.

Rawalpindi's population density around the Nullah Lai is about 4,200 persons per km<sup>2</sup> (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<sup>26</sup>

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 neighbouring 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 groundwater sources, which are already depleting fast. The excessive exploitation of groundwater 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 groundwater or to get water from other neighbourhoods. The heavy reliance on groundwater 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 groundwater 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 pattern and poor socioeconomic condition have greatly contributed to the relative vulnerability to climate change in Rawalpindi<sup>27</sup>.

#### 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

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<sup>25</sup> Pakistan government (2016, p 67) National flood protection plan

<sup>26</sup> Excerpted from Sindhu, A.S.; Rawalpindi-Islamabad: Multi Hazard Risk Mapping; Plan International Inc. Pakistan; 2014

<sup>27</sup> 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.



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: <ul style="list-style-type: none"> <li>• Tap water: 65-70%</li> <li>• Hand pumps: 2%</li> <li>• Boreholes: 25%</li> <li>• Wells: 1-2%</li> <li>• Water vendors: 5%</li> </ul>
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 have 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

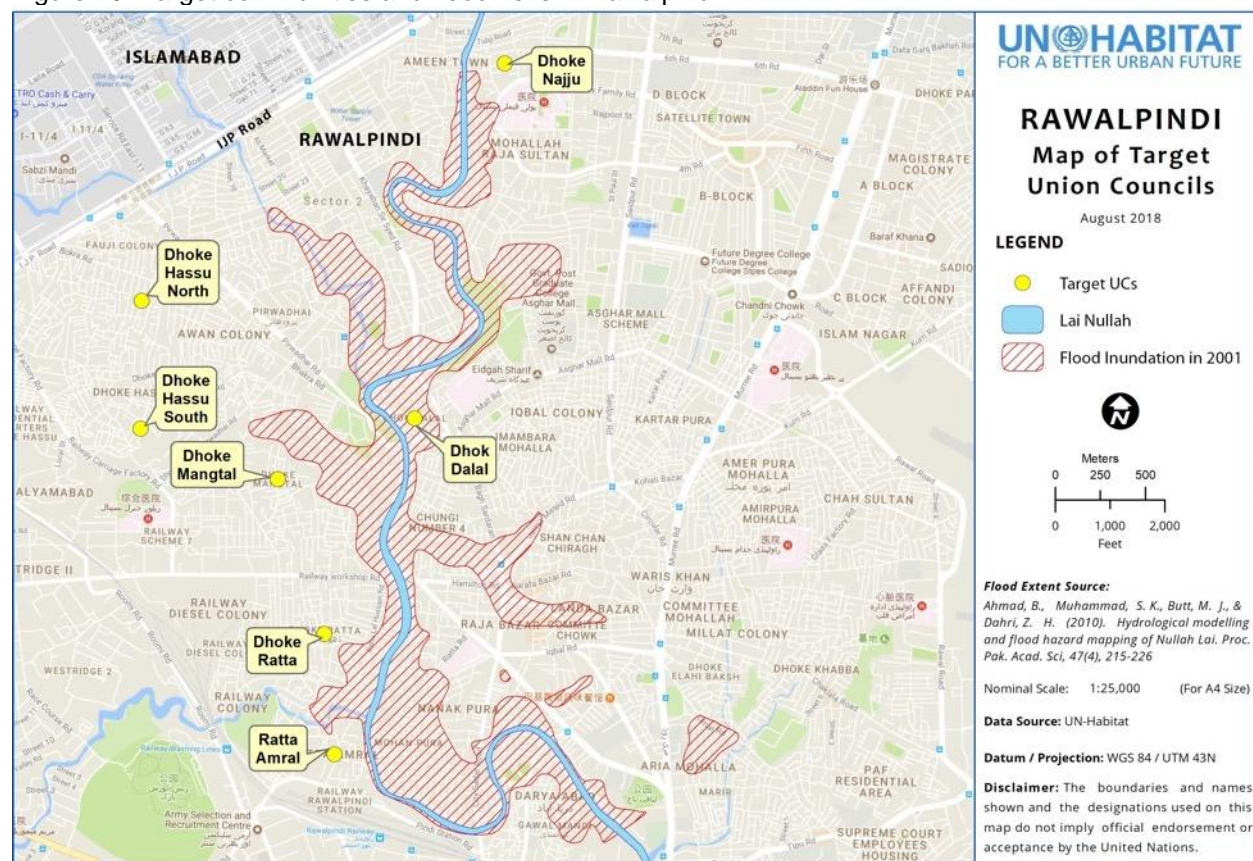


Table 6: Target communities and population, main climate change hazards and effects, barriers to adapt and possible resilience building interventions (based on consultations (see [Part II.H](#) and [annex 1](#)))

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)	43,000 (2018 estimation)	1. Water scarcity (caused by increased droughts and contaminated water due to increase of floods that contaminate groundwater)	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Getting water for poor households, which make up more than half of the community, cost them considerable portion of their meager incomes</li> <li>- Collection of water largely rests with women and children. Sometimes they spend hours in this activity</li> <li>- Lack of water availability also compromise hygiene needs, which in turn affect health.</li> <li>- Scarcity of water is also a source of feuds among neighbors.</li> </ul> <p>Gender (women) specific:</p> <ul style="list-style-type: none"> <li>- Women have to travel almost two kilometers to bring drinking water from two nearby water sources--private boreholes (in Dhok Najju).</li> </ul>	<ul style="list-style-type: none"> <li>- Dependence on groundwater, which is polluted and for which water tables have dangerously gone down</li> <li>- For a borehole, households have to dig as deep as 300 feet and even more, which is costly</li> <li>- Absence of water sector planning at various levels.</li> <li>- Lack of awareness and technical support</li> </ul> <p>Gender (women) specific:</p> <ul style="list-style-type: none"> <li>- Women are not involved in any community-based decision making</li> <li>- The respondent women had little idea of water harvesting techniques and how they may affect their lives</li> <li>- Since they are poor they would not be able to invest in rainwater harvesting technology.</li> </ul>	<ul style="list-style-type: none"> <li>- Rainwater harvesting</li> <li>- Construction of new dams*</li> <li>- Rehabilitation of existing tube wells*</li> </ul>
Dhoke Hassu North (UC 5)	38,700				
Dhoke Hassu South (UC 6)	34,000				
Dehook Najju (UC 12)	40,000				
	<p>Total: 155,700</p> <ul style="list-style-type: none"> <li>- Female: 47%</li> <li>- &lt; age14: 37%</li> <li>- age 15-24: 21%</li> <li>- age 25-60: 39 %</li> <li>- &gt; age 60: 3%</li> <li>- Disabled: 2%</li> <li>- Some Afghan refugee families</li> </ul>				
		2. Water borne diseases (caused by contaminated water)	<ul style="list-style-type: none"> <li>- Contaminated water is a source of number of water-borne diseases including diarrhoea, gastro and hepatitis to name a few.</li> <li>- The poor households are among the most affected as they prefer quantity over quality</li> </ul> <p>Gender (women) specific:</p>	<ul style="list-style-type: none"> <li>- People do not have a control on quality of water being supplied through municipal authorities as well as water vendors.</li> <li>- General lack of awareness and absence of options</li> <li>- Households who can afford have installed water filters</li> </ul>	<ul style="list-style-type: none"> <li>- Laying of water supply pipes in a manner that they are not close to sewerage system*</li> <li>- Installation of water filtration plants and their</li> </ul>

		due to increase of floods that contaminate ground-water)	<ul style="list-style-type: none"> <li>- 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.</li> </ul>	<p>while some also practice boiling of water before consumption for drinking purposes.</p> <p>Gender (women) specific:</p> <ul style="list-style-type: none"> <li>- Women are not involved in any community-based decision making</li> </ul>	<p>regular maintenance</p> <ul style="list-style-type: none"> <li>- Boiling/disinfection of water before consumption*</li> <li>- Awareness campaigns</li> </ul>
		3. Flooding from Nallah Lai and other drains	<ul style="list-style-type: none"> <li>- 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.</li> <li>- In absence of an effective solid waste management system, waste ends up in local drains and Lai Nallah causing high levels of pollution.</li> <li>- Although floods affect all, they affect most to those households who are located just next to the Lai Nallah and other drains.</li> <li>- During rainy season the houses located next to Lai Nallah and other drains get affected almost annually.</li> </ul> <p>Gender (women) specific:</p> <ul style="list-style-type: none"> <li>- Women being responsible for house-keeping have to put a lot of effort and time in cleaning their houses whenever these are affected by floodwaters.</li> <li>- The monsoon season brings fear and especially women have to stay extra conscious spending sleepless nights.</li> </ul>	<ul style="list-style-type: none"> <li>- Dense area and little options to move away from risk areas</li> <li>- 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.</li> <li>- At some places, people have constructed small embankments, walls to remain safe from flooding. However, this strategy rarely helps.</li> </ul> <p>Gender (women) specific:</p> <ul style="list-style-type: none"> <li>- Women are not involved in any community-based decision making</li> </ul>	<ul style="list-style-type: none"> <li>- Construction of new dams*</li> <li>- Other proposed interventions are (partly) being done by the government)*</li> </ul>

\*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). 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 2<sup>nd</sup> floor of houses.



Figure 11b: Flood and drought coping mechanisms – groundwater 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<sup>28</sup>

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



Figure 13: Rescue from floods in Nowshera

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 wastewater 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, Khesgi Bala, Akbar Pura, Pir Sabak, Nizampur, Kaka Sahab, Cherat, and surrounding areas are all prone to flash floods.

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 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 2010-11. It caused drastic losses to infrastructure, government installations, properties, businesses, livestock and houses.

### Specific drought and water scarcity risks, impacts and vulnerabilities

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

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<sup>28</sup> 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.

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, Durrani, Kakakhels, Yousafzai, Afridi.<sup>29</sup> Economically speaking, 22 percent of the population relies on agriculture while majority of the people are in other profession or in government service.<sup>30</sup> 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: <ul style="list-style-type: none"><li>• Tap water: 27%</li><li>• Hand pump: 22%</li><li>• Motor pump: 47%</li><li>• Dug well: 2%</li><li>• Other: 2%</li></ul>
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.

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.

<sup>29</sup> District Disaster risk management plan Nowshera 2014

<sup>30</sup> Idem



Figure 14: Target communities in Nowshera

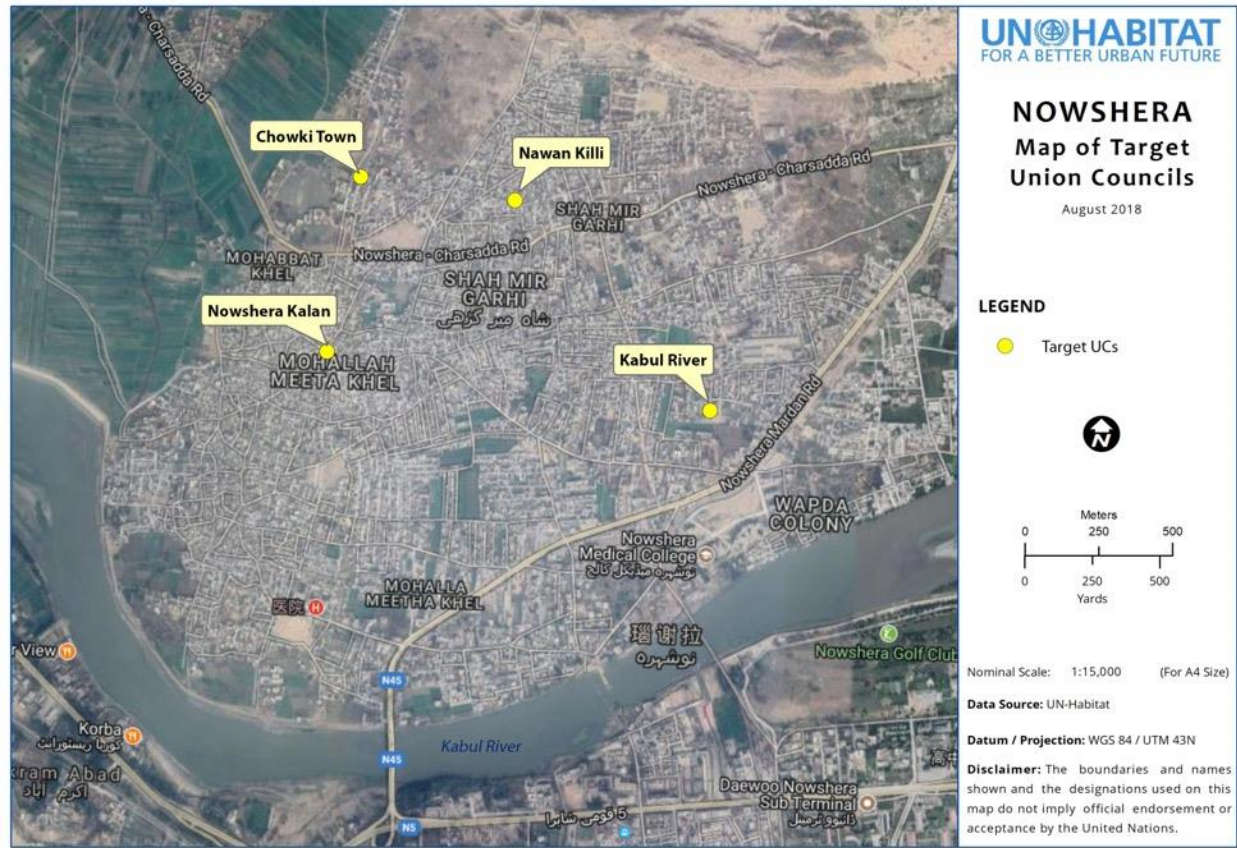


Table 7: Target communities and population, main climate change hazards and effects, barriers to adapt and possible resilience building interventions (based on consultations (see [Part II.H](#) and [annex 1](#)).

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 <ul style="list-style-type: none"> <li>- Female: 48%</li> <li>- &lt; age14: 38%</li> <li>- age 15-24: 20%</li> <li>- age 25-60: 40 %</li> <li>- &gt; age 60: 2%</li> <li>- Disabled: 2%</li> <li>- 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.</li> </ul>	1. Drought / scarcity of clean water (caused by increased droughts and contaminated water due to increase of floods that contaminate groundwater)	<ul style="list-style-type: none"> <li>- The available water from municipal supplies stinks and is highly contaminated.</li> <li>- The groundwater up to the depth of 100 ft is not fit for human consumption.</li> <li>- The poor households not being able to afford water purification/filtration systems are compelled to consume contaminated water</li> </ul>	<ul style="list-style-type: none"> <li>- Citizens consider that supply of water is responsibility of government.</li> <li>- Especially poor and lower middle-income households can't afford to install bore-holes to extract groundwater from safer depths</li> <li>- Households generally are not aware of household level low cost water treatment technologies as is apparent from lack of availability of these technologies.</li> <li>- Water harvesting at community and household levels has never been considered as an option. Most of the respondents had not heard of them even.</li> </ul>	<ul style="list-style-type: none"> <li>- Overhauled city's water distribution system.*</li> <li>- Installed and regularly maintained water filtration plants in every neighborhood.</li> </ul>
		2. River flooding	<ul style="list-style-type: none"> <li>- 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.</li> <li>- 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.</li> <li>- Settlements located in close proximity to River Kabul and water channels that</li> </ul>	<ul style="list-style-type: none"> <li>- The communities are not familiar with community-based flood management measures.</li> <li>- Flood resilient building codes and practices and land use controls are not in place.</li> <li>- 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</li> </ul>	<ul style="list-style-type: none"> <li>- Construction of retaining walls and embankments.*</li> <li>- Construction of check dams and water storage ponds*</li> <li>- Installation of an effective flood early</li> </ul>

			<p>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.</p>	<p>water channels. When rain-water flows in these channels it causes damage to these structures.</p> <ul style="list-style-type: none"> <li>- The city has a poor drainage system</li> <li>- 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.</li> </ul>	<p>warning system.*</p>
		<p>3. Diseases/epidemics (caused by contaminated water due to increase of floods that contaminate groundwater)</p>	<ul style="list-style-type: none"> <li>- There is high prevalence of diseases like dengue, gastro, diarrhea, cholera and hepatitis. Local residents attribute them to poor sanitary conditions of the city.</li> <li>- The disease outbreak intensifies in flooding seasons.</li> <li>- 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.</li> <li>- 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</li> <li>- The burden of disease not only causes health problems but also causes economic losses by reducing the productive time available to poor families.</li> <li>- Poor households have to allocate a considerable portion of their meager incomes on healthcare.</li> <li>- Incidences of diarrhea are high among the infants and younger children</li> </ul>	<ul style="list-style-type: none"> <li>- The municipal authorities neither have financial resources nor have technical skills at their disposal to address city's chronic water contamination challenge.</li> <li>- Many households have installed hand pumps as main source of water supply. However, these too do not deliver clean drinking water</li> <li>- 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.</li> </ul>	<ul style="list-style-type: none"> <li>- Design of effective waste management plan for liquid and solid waste to stop the contamination of drinking water developed by concerned authorities.</li> </ul>

\*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). 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](http://www.bostonglobe.com). A Majeed/AFP/Getty Images



## 2. Project Objectives

The main objective of the proposed project is to “enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera” This will be achieved through the following proposed sub-objectives:

Community level:

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

District / City level:

2. Enhance city and district-level water harvesting facilities in public buildings and on water storages in public gardens, develop district / city-level spatial strategies as tool to assess climate change related floods, droughts and water scarcity to plan for and manage climate change risks and to strengthen capacities to plan, construct, operate, maintain and duplicate water harvesting facilities in public buildings and gardens..

National level:

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



### 3. Project Components and financing

Table 8: Project components and financing

Project Components	Expected Concrete Outputs	Expected Concrete Outcomes	Amount (US\$)
<p>Component 1</p> <p>Community level activities:</p> <p>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.</p>	Output 1.1. (concrete)	Outcome 1.1.	2 million
	5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques	Increased adaptive capacity within the water sector at community level – 38,885 people benefitting directly from rainwater harvesting facilities (7 people per household) and around 200,000 indirectly	
		In line with AF outcome 4	
	Output 1.2.	Outcome 1.2.	800,000
	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 and linking communities with city authorities to operate solid waste management mainly collections in target areas	Strengthened awareness of flood and water risks and impacts and how to address these at community level and ownership of rainwater facilities built.	
		In line with AF outcome 3	
	Total		2,8 million
<p>Component 2</p> <p>District / city level activities</p> <p>Enhance city and district-level water harvesting facilities in public buildings and on water storages in public gardens, develop district / city level spatial strategies as tool to assess climate change related floods, droughts and water scarcity to plan for and manage</p>	Output 2.1. (concrete)	Outcome 2.1.	1,2 million
	50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed	Increased adaptive capacity within the water sector at district / city level by identifying water management structures recommended on other critical interlinked structures through spatial planning	
		In line with AF outcome 4	
	Output 2.2.	Outcome 2.2.	200,000
	Two district / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and droughts, and including	Strengthened urban level government capacity to reduce climate change related flood and drought risks, also beyond city boundaries	

climate change risks and to strengthen capacities to plan, construct, operate, maintain and duplicate water harvesting facilities in public buildings and gardens.	comprehensive water harvesting plans. These strategies are decision-making tools for cities to assess climate change related floods, droughts and water scarcity to plan for and manage climate change-related risks and impact in and beyond city boundaries, taking into consideration multiple sectors	In line with AF outcome 2	
	Output 2.3.  50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity in developing 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 water scarcity caused by 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 guidelines and 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 focused on climate change / disaster risk reduction developed  One set of National guidelines for spatial 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		783,014
	5. Total components		<b>5,083,014</b>
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
<b>Amount of Financing Requested</b>			<b>6,094,000</b>

#### Projected Calendar:



Milestones	Expected Dates
Start of Project/Programme Implementation	01-2020
Project/Programme Closing	01-2025
Terminal Evaluation	09-2024

## PART II: PROJECT / PROGRAMME JUSTIFICATION

### ***A. Project components***

In order to achieve the overall project objective to “enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera, the project combines horizontally and vertically interrelated activities: spatial planning 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 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.

## Problem statement

Urban communities, particularly poor in high dense areas, are often experienced flood impacts and drought / water scarcity issues and economic loss over last 20 years amounted USD 4 billion. Livelihoods of the poor and the underprivileged segments of society are particularly at risk from the increasing exposure to natural calamities, such as flash floods, riverine overflows, heavy monsoons, cyclones, droughts and heat waves and loses almost 6 percent of GDP per annum due to environmental degradation

## Project Objective

"Enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera, Pakistan".

### Intervention goal 1

Community and household-level flood resilient water harvesting facilities enhanced and capacities strengthened to plan, construct, operate, maintain and duplicate these in Rawalpindi and Nowshera benefitting at least 238,935 people

### Intervention goal 2

City/district-level water harvesting facilities in public buildings and on water storages in public gardens, develop district / city level spatial strategies as tool to assess climate change related floods, droughts and water scarcity to plan for and manage climate change risks and to strengthen capacities to plan, construct, operate, maintain and duplicate water harvesting facilities in public buildings and gardens.

### Intervention goal 3

National-level capacity strengthened to guide direct/ city-level development considering climate change and disaster risks and impacts, especially water scarcity caused by floods and droughts.

**Outcome 1.1**  
Adaptive capacity increased within the water sector at community level benefitting directly 38,885 people from rainwater harvesting facilities and around 200,000 indirectly

**Outcome 1.2**  
Strengthened awareness of flood and water risks and impacts and how to address these at community level and ownership of rainwater facilities built.

**Outcome 2.1**  
District/city adaptive capacity Increased within water sector by identifying water management structures recommended on other critical interlinked structures through spatial planning

**Outcome 2.2**  
Urban level government capacity strengthened to reduce climate change related flood and drought risks, beyond city boundaries

**Outcome 3.1**  
National level government capacity strengthened to reduce climate change related risks and impacts in urban areas

**Outcome 3.2**  
National level government capacity strengthened to reduce climate change related risks and impacts in urban areas

**Output 1.1**  
5000 community / household level flood resilient rainwater harvesting facilities constructed, using innovative techniques

**Output 1.2**  
8 union council-level community plans developed, community members (especially women and youth) trained & practical guide developed to plan, construct, operate, maintain & duplicate water harvesting facilities at community level, & to reduce waste in drainage channels through awareness campaigns

**Output 2.1**  
50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed

**Output 2.2**  
2 district/city-level spatial planning strategies developed focussing on climate change risks and impacts, especially floods droughts, including comprehensive water harvesting plans.

**Output 2.3**  
50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity in developing 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 guidelines and tools

**Output 3.2**  
One National urban strategy focussed on climate change / disaster risk reduction developed  
One set of National guidelines for spatial planning considering climate change / disaster risks developed

## Activities

- Construct rainwater harvesting facilities at household level, public buildings and on water storages in public gardens, using innovative techniques
- Develop community plans and practical guides to plan, construct, operate, maintain and duplicate water harvesting facilities at community level through wider stakeholder participation (especially women and youth)
- Conduct awareness raising campaigns on reducing waste in drainage channels
- Develop district/city level spatial strategies focussing on climate change risks and impacts specially floods and droughts including comprehensive rainwater harvesting plans
- Develop guide and train government officials to plan, construct, operate, maintain and duplicate flood-resilient water harvesting facilities and strengthen capacity developing spatial plans
- Train government officials (women / men) to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning guidelines and tools
- Develop National Urban Strategy focussing on climate change / disaster risk reduction and develop set of National guidelines for spatial planning considering climate change / disaster risks
- Capture lessons learned throughout the project, formulate knowledge products (both in local language and English) and disseminate in local and international forums

## **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 clean / safe water. 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. 5000 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 awareness of adaptation to climate change induced flood and drought impacts and build capacity and ownership to develop, operate, maintain and duplicate 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.

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 water harvesting facilities in public buildings and gardens, develop district / city-level spatial planning strategies considering climate change risks and impacts, strengthen capacities to plan, construct, operate, maintain and duplicate water harvesting facilities in public buildings and gardens and to enhance capacity developing spatial plans. 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 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 rainwater 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 unplanned settlements identifying their sources, treatment facility, wastewater treatment facility, etc. This will be done through the following outputs:

- 2.1. 50 district / city-level water harvesting facilities in public buildings and gardens constructed
- 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.
- 2.3. 50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity developing spatial plans.

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 water harvesting techniques in public buildings and gardens and spatial planning 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<sup>31</sup> 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 guidelines and tools.
- 3.2. One National urban strategy focused on climate change / disaster risk reduction developed
- 3.3. One set of National guidelines for spatial 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 be 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 spatially planned best taking these risks into

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<sup>31</sup> The Khyber Pakhtunkhwa Protection of River (Amendment Act) 2014

consideration. This information will also feed into city-level spatial strategies to be developed for the target cities (output 2.2). This will entail a strategy for spatial development for the whole city and beyond its city boundaries. Taking flood and drought risks and impacts on multiple sectors and other relevant risks and development, such as population growth, need for services and infrastructure, etc. into consideration. 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 18<sup>th</sup> constitutional amendment in 2010 ensures that urban planning and urban design, urban land-use control, 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. The Regulations Department includes building regulations, prepare and implement schemes for protection of environment, enforce all municipal laws, rules and bye-laws. The 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. The Finance Departments prepare annual and revised budgets, management and control of local funds including taxes, fees, charges etc. Some of the key functions of the 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 and incorporated into the work plans of the Infrastructure and Service Departments. The 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 apply guidelines on spatial planning strategies in developing 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 benefit from the project actions.

With regard to Nowshera city there are three main administrative parts—one that lies in the domain of Nowshera Municipal Committee, one that lies in the limits of Nowshera Cantonment Board and one under the 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 spatial planning, b) project activities 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 the respective deputy commissioner. This multi-governance disaster management structure functions as multi-layered decision-making process which is a part of Disaster Management particularly managing dams and rivers. Consultations for the formulation of concept proposal included NDMC, FCC and NDMAs and PDMA and will be part of the project implementation framework.

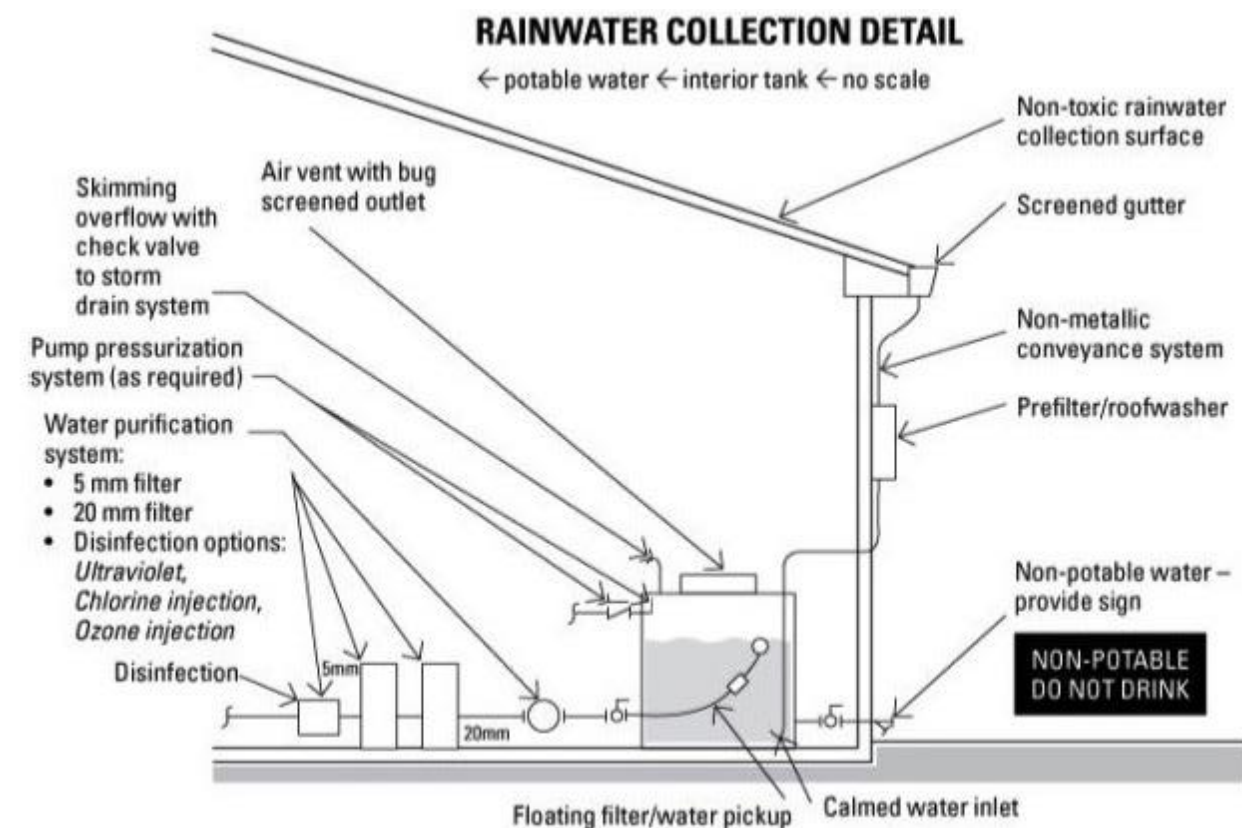
Waste management is one of the primary municipal functions of local governments in Pakistan. The unchecked dumping of solid waste in and at the embankments of waterways including Kabul river, its tributaries in Nowshera and in Lai Nallah and its tributaries in Rawalpindi is known to increase urban flooding. The Government has taken significant institutional and infrastructure investment in solid waste management. The 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 of component 1 and 2**

### Household level and district/city 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.

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. 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 (see [annex 5](#)). 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 rainwater harvesting tools but also usable in dry seasons with operational benefits of filtration over storage. This ensures continued 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 household, on public buildings and on water storages in public gardens with orientation at the time of installation. Services of field staff of Public Health Departments who are at presently engaged in inspections of houses and public facilities in the communities and district/city 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 manage 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.

## ***B. Economic, social and environmental benefits***

The fundamental benefit of the project is to enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts through 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, 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.	<p>Component 1:</p> <ul style="list-style-type: none"> <li>❑ 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.</li> <li>❑ 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 due to easier access to clean drinking water, especially the installation of water purification systems within the rainwater harvesting facilities will bring positive economic benefits to poor households.</li> </ul>

		<ul style="list-style-type: none"> <li>❑ Impacts of recurrent flooding is exacerbated by clogged channels by solid waste and affect business activities in the target areas as well as the cities' economic force as these business activities are located in the cities' main commercial centers. By properly addressing flood management in community plans, and by conducting awareness campaigns to reduce clogging of channels through waste that causes groundwater contamination and floods these business activities will also be positively impacted thus contributing to community and city scale economies.</li> <li>❑ Rainwater harvesting is known to be a method for economically efficient use of natural resources.</li> <li>❑ Rainwater harvesting will open new business and employment opportunities</li> <li>❑ Year-round water supply through project will reduce cost spend for buying water during dry season.</li> </ul> <p>(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)</p> <p>Component 2:</p> <ul style="list-style-type: none"> <li>❑ 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 are 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.(See <a href="#">annex 5</a>)</li> <li>❑ The rainwater harvesting will promote economically efficient use of natural resources at city/district scale. Additionally, it will also support the economic benefits of component 1 as rainwater harvesting facilities in public buildings and gardens are accessible by the public and for public use.</li> <li>❑ Training of government officials on guiding development to plan, construct, maintain and duplicate flood resilient water harvesting facilities ensures economic sustainability of the project's outcomes beyond the project's timeframe. Further, these in-house trainings reduce the cost for replication of the concrete intervention and ensures sustainability of institutional knowledge by also strengthening capacity in developing spatial plans.</li> </ul> <p>(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)</p> <p>Component 3:</p> <ul style="list-style-type: none"> <li>❑ 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</li> </ul>
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		<p>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.</p> <ul style="list-style-type: none"> <li>❑ 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.</li> </ul>
Social	<p>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.</p>	<p>Component 1:</p> <ul style="list-style-type: none"> <li>❑ Consistent vulnerability to floods exacerbated by clogged channels has caused a general sense of insecurity in the target households and communities. By raising awareness on proper waste disposal and the consequences of clogged channels during reoccurring floods, the community can restore a sense of control over climate change induced impacts and will feel empowered.</li> <li>❑ Scarcity of clean drinking water causes greater disease levels and generally reduces wellbeing. The project will increase access to safe water and thus reduce incidence of disease and improve general wellbeing.</li> <li>❑ The considerable time spent, especially for poor women and children, in hauling water, compromise their leisure opportunities and is a social burden. By easing this burden, the project will contribute in bringing more leisure time for them.</li> <li>❑ 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.</li> <li>❑ Continuously seeking favors from neighbors and water providers on part of poor households to access water causes them to compromise on their self-esteem, dignity and manifests unfavorable power-dynamics. The project will bring them this socio-psychological relief.</li> <li>❑ 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.</li> </ul> <p>Component 2:</p> <ul style="list-style-type: none"> <li>❑ With introduction of participatory, gender and pro-poor sensitive plans and strategies at city and district scale, the component will contribute in amplifying all social benefits anticipated 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</li> </ul>

		<p>communities and stakeholders in a gender and pro-poor sensitive manner. This will in turn contribute in making planning a tool for social justice.</p> <p>Component 3:</p> <ul style="list-style-type: none"> <li>❑ 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, pro-poor, disaster and climate sensitive will contribute in turning rapid urbanization of Pakistan into a social, economic and environmental opportunities</li> </ul>
Environmental	<p>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.</p>	<p>Component 1:</p> <ul style="list-style-type: none"> <li>❑ 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, 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, 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 resulted in drastic lowering of water tables.</li> </ul> <p>Component 2:</p> <ul style="list-style-type: none"> <li>❑ 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 district/city scale rainwater harvesting facilities in public buildings and gardens will strengthen the environmental benefits under component 1 with a larger scale number of beneficiaries per intervention having greater impacts on restoring depleting groundwater tables, addressing water scarcity and provide safe drinking water. Further, district/city level spatial planning strategies will contribute in better management of urban wetlands and their environmentally sustainable integration into larger urban development interventions. This will 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.</li> </ul> <p>Component 3:</p> <ul style="list-style-type: none"> <li>❑ The national and provincial level strategies and plans will have environmental sustainability as cross cutting theme besides gender and pro-poor sensitivity. The proposed plans, policies and strategies that the project</li> </ul>



		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.
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## 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.<sup>32</sup> Through promoting 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. 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: Enhancing community- and household-level flood resilient rainwater harvesting facilities is a cost-effective way of supplying clean water in areas which experience droughts and where drinking water (from boreholes) is contaminated by floods and poor drainage and sewerage systems. As these conditions often occur in informal areas, the replication of the intervention through innovative techniques will benefit the most vulnerable.

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 in other areas.<sup>33</sup>

This 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.

<sup>32</sup> Pakistan's INDC, p14

<sup>33</sup> Mosley, Luke M. "Drought impacts on the water quality of freshwater systems; review and integration." *Earth-Science Reviews* 140 (2015): 203-214.

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 no 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 and would not guarantee the same level of social and environmental safeguards and gender-responsiveness as proposed under this project.

Cost-effective rationale component 2: District/city-level flood resilient rainwater harvesting facilities in public buildings and gardens is a cost-effective way of supplying clean water for the public as open facilities especially in areas experiencing droughts and contamination of drinking water by climate change-induced floods and poor drainage and damaged sewerage systems.

Alternatively, new boreholes, wells and flood-resilient piped water infrastructure could be built, but as seen in the past groundwater of boreholes and wells is contaminated by floods, contaminated water run-off, leaking sewage systems and waste-clogged channels. Building flood-resilient piped water infrastructure in a highly dense urban settlements will be a very cost-intense intervention with a less favourable cost-beneficiary ratio. Additionally, construction of piped water systems are likely to cause resettlement and eviction in informal areas.

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).

Alternatively, infrastructure interventions, such as construction of drainage channels, resilient assets and houses in areas at risk of floods could be proposed, but this would be costlier in the dense target areas as such actions lead to land readjustment and resettlement, temporary dislocation of families (during construction) and larger investments for municipalities which could not come from annual revenue.

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. Government-level capacity building is proposed to institutionalise innovative technologies for rainwater harvesting, ease and coordinate replication and sustainability of the project and proposed activities, including establishing operation and maintenance arrangements, which in turn will reduce costs for maintaining and monitoring intervention.

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 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)  5,000 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: 38,885  Indirect: around 222,200	USD 51 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)  50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed	Rawalpindi: especially UC 1,2, 4,5, 6, 12 and 37 + whole of Rawalpindi  Nowshera Kalan + other parts of Nowshera District	Direct: 250,000  Estimations for water use to be made	USD 4.8 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 enhance capacity developing spatial plans	Rawalpindi City  Nowshera City	Direct: 50  Estimation of indirect beneficiaries through 'training of trainers' model and iteration/replication of trainings to be made	USD 400 pp for training only which includes at least 4 reiterative modules of trainings.
	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 guidelines and tools.	Concerned federal and provincial government officials	Direct: 100  Estimation of indirect beneficiaries through 'training of trainers' model and iteration/replication of trainings to be made	USD 300 pp for training only which includes at least 3 reiterative, high level and subject specific modules of trainings conducted by experts
Component 3  National level activities:	Output 3.2.  One National urban strategy focused on climate change / disaster risk reduction developed  One set of National guidelines for spatial 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. Inter alia it aims to address SDG target 6.6 on "protect and restore water-related ecosystems" by 2020. 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, recognize water scarcity as an emerging (climate change related) priority and propose rainwater harvesting as adaptation measure.

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
<b>Climate change priorities</b>		
Pakistan NEEDS study <sup>34</sup>	2011	Adaptation assessment:  Water resources (flooding and water demand): <ul style="list-style-type: none"> <li><input type="checkbox"/> Flood plain management along the flood corridor to ensure minimum damage to human lives and infrastructure during floods.</li> <li><input type="checkbox"/> Climate proofing of future infrastructure investments to cater the threats of climate induced disasters such as floods.</li> </ul>

<sup>34</sup><https://unfccc.int/files/adaptation/application/pdf/pakistanneeds.pdf>



National Climate Change Policy <sup>35</sup>	2012	The National Climate Change Policy states a number of priority areas: <b>1) Water resources</b> 2) Agriculture and livestock <b>3) Human health</b> 4) Forestry 5) Biodiversity <b>6) Disaster preparedness</b> <b>7) Socioeconomic issues (poverty, gender)</b>
Framework for implementation of the climate change policy (2014-2030) <sup>36</sup>	2013	Relevant sectors, objectives and strategies: <b>Water sector:</b> 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  <b>Disaster preparedness sector:</b> 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  <b>Health sector:</b> Strategy 1.4. Clean drinking water  <b>Urban planning sector:</b> Objective 1: Introduce innovative town planning Strategy 1.4. Hazard mapping and zoning
Nationally Determined Contribution <sup>37</sup>	2016	The NDC focuses primarily on mitigation issues, but outlines a number of relevant adaptation priorities:  <b>Short term</b> Strengthen adaptation planning capacity Strengthen disaster risk management capacity  <b>Medium term</b> Improving irrigation Water resource management Climate resilient infrastructure
<b>National development priorities</b>		
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: <ul style="list-style-type: none"> <li>- Preparing for climate change and its accompanying uncertainties through comprehensive adaptation and mitigation planning and concrete implementation measures</li> <li>- 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).</li> </ul>

<sup>35</sup>[http://www.gcisc.org.pk/National\\_Climate\\_Change\\_Policy\\_2012.pdf](http://www.gcisc.org.pk/National_Climate_Change_Policy_2012.pdf)

<sup>36</sup> <http://www.gcisc.org.pk/Framework%20for%20Implementation%20of%20CC%20Policy.pdf>

<sup>37</sup> <http://www4.unfccc.int/ndcregistry/PublishedDocuments/Pakistan%20First/Pak-INDC.pdf>

		<ul style="list-style-type: none"> <li>- Undertake strategic adaptation responses at policy, 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.</li> </ul>
Pakistan 2025 <sup>38</sup>	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).
<b>Sectoral priorities</b>		
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 <sup>39</sup>	2013	<p>Relevant Policy objectives:</p> <p>2.4.1. Creating an integrated national capacity to identify and monitor vulnerability and hazard trends including potential climate change impact</p> <p>2.4.3. Strengthening an integrated disaster preparedness and response capacity from the local to the national level</p> <p>2.4.4. Promoting development planning that considers and addresses disaster risks alongside environmental and climate change concerns</p> <p>2.4.5. Strengthening the structural and non-structural resilience of key infrastructure and lifelines in Pakistan</p> <p>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</p> <p>2.4.7. Strengthening Local Level Risk Reduction capacity focusing upon communities, and supportive linkages with Union Councils, tehsils and districts</p> <p>2.4.8. Ensuring DRR is systematically integrated into recovery and reconstruction programming, “building better, safer and stronger” and informing DRR mainstreaming in general</p>
National flood protection plan <sup>40</sup>	2016	<p>Relevant planning strategy</p> <p>The plan recognised the National Water Policy as an important strategy to be implemented in parallel:</p> <p>The planning strategy has thus following relevant element:</p> <ul style="list-style-type: none"> <li>- Reducing susceptibility to damage:             <ol style="list-style-type: none"> <li>1. Flood Forecasting and Early Warning</li> </ol> </li> </ul>
National water policy <sup>41</sup>	2018	Most relevant policy objectives:

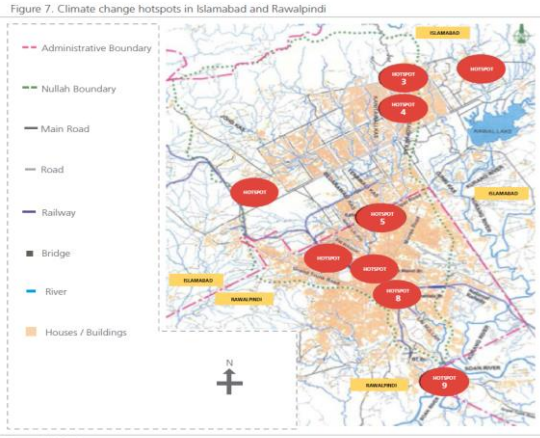
<sup>38</sup> <http://fics.seecs.edu.pk/Vision/Vision-2025/Pakistan-Vision-2025.pdf>

<sup>39</sup> <http://www.ndma.gov.pk/Documents/drrpolicy2013.pdf>

<sup>40</sup> <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>

<sup>41</sup> [https://drive.google.com/file/d/17VO\\_3ysV5s-dEmMeAfKIOxCnV5yBFvIq/view](https://drive.google.com/file/d/17VO_3ysV5s-dEmMeAfKIOxCnV5yBFvIq/view)

		<p>2.2. Augmentation of the available water resources of the country through judicious and equitable utilization via, conservation and efficient use;</p> <p>2.3. Improving availability, reliability and quality of fresh water resources to meet critical municipal, agricultural, energy, security and environmental needs;</p> <p>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;</p> <p>2.7. Providing food security and expanding water availability to help adapt to climate change, population and other large-scale stresses;</p> <p>2.12. Flood management to mitigate floods and minimize their damages;</p> <p>2.13. Drought management with emphasis on long term vulnerability reduction;</p> <p>2.15. Promoting appropriate technologies for rainwater harvesting in rural as well as urban areas;</p> <p>2.21. Profitable use of flood water towards promotion of local irrigation practices;</p> <p>2.27. Climate change impact assessment and adaptation for sustainable water resources development and management;</p> <p>Most relevant priorities:</p> <p>3.3. Leveraging Technology: Adoption of new technologies is urgently needed</p> <p>Relevant water conservation needs:</p> <p>7.3 It is recognized that the large annual and seasonal variability of fresh-water availability makes it necessary to:</p> <p>7.4. The Water Conservation Plans shall include:</p> <ul style="list-style-type: none"> <li>- Adoption of rainwater harvesting technology.</li> <li>- Adoption of water conservation techniques/technologies at the farm level.</li> </ul>
National Sanitation Policy	2006	<ul style="list-style-type: none"> <li>- The sanitation policy covers solid waste management, to which this project will align</li> </ul>
<b>Sub-national priorities</b>		
Rawalpindi and Nowshera Development and Strategic Plan		<p>The project is in line and will ensure consistency with:</p> <ul style="list-style-type: none"> <li>- Annual plans</li> <li>- Structure plan</li> <li>- Local plans</li> <li>- Sectoral plans</li> </ul>
<p>The flood management plan of Rawalpindi</p> <p>And</p> <p>Rawalpindi district</p>	2009	<p>The following areas are identified as being most vulnerable to floods:</p>

disaster risk reduction plan		<ul style="list-style-type: none"> <li>- Dhoke Najju</li> <li>- Zia ul Haq Colony</li> <li>- New Phagwari</li> <li>- Mohallah Raja Sultan</li> <li>- Dhoke Ratta</li> <li>- Ratta Amral</li> <li>- Gawalmandi</li> <li>- Javed Colony</li> <li>- Chamanzar</li> <li>- Tipu Road</li> <li>- Dhoke Ellahi Bakhsh</li> </ul>  <p>Figure 7. Climate change hotspots in Islamabad and Rawalpindi</p> <p>Source: UN-Habitat</p> <p>All these localities are located along Lai Nallah.</p>
Nowshera district disaster risk reduction plan	2014	<p>Priority Areas:</p> <ul style="list-style-type: none"> <li>- Established the institutional and legal system for disaster management</li> <li>- Prepare disaster management plans at various levels</li> <li>- Conduct multi-hazard, vulnerability and risk assessment</li> <li>- Establish multi-hazard early warning and evacuation systems</li> <li>- Promotion of Training, Education and Awareness in relation to DM</li> <li>- Strengthen programs on disaster risk reduction at local level</li> <li>- Infrastructure development for disaster risk reduction</li> <li>- Mainstreaming disaster risk reduction into development</li> <li>- Establish District Emergency Response System</li> <li>- Capacity Development for Post Disaster Recovery</li> </ul>
The Khyber Pakhtunkhwa Protection of River (Amendment Act)	2014	<p>Provision on:</p> <ul style="list-style-type: none"> <li>- Population residing in areas neighbouring River Kabul and flood protection measures for River Kabul</li> <li>- Physical works and developmental work within 200ft from the slope of the rivers or their tributaries</li> <li>- Disposal of solid or hazardous waste or other substances specified and notified by Government (directly or indirectly) into the rivers</li> <li>- Obligation for governmental land-use and zoning plans for catchment area of rivers and their tributaries</li> </ul>

### ***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.<sup>42</sup>

#### Projects Requiring an EIA (Screening)

<sup>42</sup> [http://cmsdata.iucn.org/downloads/niap\\_\\_\\_eia\\_handbook.pdf](http://cmsdata.iucn.org/downloads/niap___eia_handbook.pdf)

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, water supply and treatment systems (Annex 2, Table 20, section G) require an IEE- Regulation 3. Proposed rainwater harvesting facilities are stand-alone, small-scale facilities with purifying technology and do not fulfil the requirements of water supply or treatment systems.

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
<p>Output 1.1. (concrete)</p> <p>5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques</p>	<ul style="list-style-type: none"> <li>- Minimum drinking water quality standards proposed by WHO</li> <li>- Applicable national and provincial drinking water quality standards</li> <li>- Building byelaws applicable in Rawalpindi and Nowshera</li> <li>- Applicable standards and guidelines by Rawalpindi Water and Sanitation Agency (RWASA) and Tehsil Municipal Administration Nowshera</li> <li>- Guidelines as enshrined in National Drinking Water Policy</li> </ul>	<p>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 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.</p>
<p>Output 1.2.</p> <p>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</p>	<ul style="list-style-type: none"> <li>- 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.</li> <li>- NDMA's guidelines for</li> </ul>	<p>Integrated union council level plans will be developed with active participation of elected representative of concerned union councils and their administration; officials and elected representatives of Nowshera and Rawalpindi's municipal corporations;</p>



through awareness raising campaigns	<p>working with vulnerable communities and groups.</p> <ul style="list-style-type: none"> <li>- Planning guidelines from Punjab and Khyber Pakhtunkhwa Planning and Development Departments</li> <li>- Applicable national and provincial laws</li> <li>- Annual Development Plans of Rawalpindi Water and Sanitation Agency, Rawalpindi Municipal Corporation, Nowshera Tehsil Municipal Administration</li> </ul>	<p>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 Municipal Corporation, and Nowshera Tehsil Municipal Administration. National Disaster Management Authority's Children and Gender Cells guidelines, where applicable, and Community Based Disaster Risk Management Guidelines will also be followed to ensure the participation of men, women, elderly, children and youth, transgender and members of religious and ethnic minorities.</p>
<p>Output 2.1. (concrete)</p> <p>50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed</p>	<ul style="list-style-type: none"> <li>- National and Provincial Environmental Protection Acts</li> <li>- Applicable national and provincial laws for water supply schemes</li> <li>- Land use / master plans of Rawalpindi, Nowshera and Islamabad</li> <li>- Relevant water sector development plans and strategies of federal government, Punjab, Khyber Pakhtunkhwa, and Rawalpindi and Nowshera Districts.</li> </ul>	<p>By taking into account legal and planning requirements; detailed assessments and feasibility studies will be 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, Islamabad Capital Territory Administration, Capital Development Authority, Rawalpindi Municipal Corporation, Nowshera Tehsil Municipal Administration and Pakistan Council of Research in Water Resources (PCRWR).</p>
<p>Output 2.2.</p> <p>Two district / city-level spatial planning strategies developed considering climate change risks and impacts, especially floods and</p>	<ul style="list-style-type: none"> <li>- Urban Planning Guidelines from Punjab Urban Unit and Khyber Pakhtunkhwa Urban Unit.</li> <li>- Urban Planning Guidelines and requirements by</li> </ul>	<p>UNHABITAT will take the lead and will extend technical and financial support to concerned municipal/local government institutions for preparation of these</p>

<p>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</p>	<p>provincial Planning and Development Departments of Punjab and Khyber Pakhtunkhwa.</p> <ul style="list-style-type: none"> <li>- Local Government Acts of Punjab and Khyber Pakhtunkhwa (both provide for and emphasize on preparation of Master / Land use/Spatial Plans for urban centers</li> <li>- National, Provincial and District Disaster Management Plans</li> <li>- Good practices by UNHABITAT and Shehersaaz</li> <li>- Annual Development Plans for Punjab, Khyber Pakhtunkhwa, Rawalpindi and Nowshera Districts.</li> <li>- Incumbent master plans for Nowshera and Rawalpindi at the time of implementation of the project</li> </ul>	<p>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 addresses the lack of strategically designed long-term urban development plans for Nowshera and Rawalpindi cities. Further the respective local government acts for Punjab and Khyber Pakhtunkhwa provinces provide for preparation of master plans for urban areas.</p>
<p>Output 2.3.</p> <p>50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity developing spatial plans</p>	<p>Not relevant</p>	<p>UNHABITAT will take the 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 experienced trainers while inviting the project's staff to share their experiences with the trainees.</p>
<p>Output 3.1.</p> <p>100 government official (women / men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning guidelines and tools.</p>	<p>Not relevant</p>	<p>UNHABITAT will take the 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.</p>
<p>Output 3.2.</p> <p>One National urban strategy focused on climate change / disaster risk reduction developed</p>	<ul style="list-style-type: none"> <li>- Pakistan Vision 2025</li> <li>- National Climate Change Policy and Implementation Plan</li> <li>- National Disaster Risk Reduction Policy</li> </ul>	<p>UNHABITAT along with other project partners will initiate the formulation process of the National Urban Policy and strategy as required by the New Urban</p>

One set of National guidelines for spatial planning considering climate change / disaster risks developed	<ul style="list-style-type: none"> <li>- National and Provincial Disaster Management Plans</li> <li>- National Water Policy</li> <li>- National Environment Policy</li> <li>- National Sanitation Policy</li> <li>- National Housing Policy</li> <li>- National Building Codes</li> <li>- Work done by Provincial Urban Units</li> <li>- Habitat III</li> <li>-</li> </ul>	Agenda to which Pakistan is a signatory. Since, 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 stakeholders. Consultative meetings will be organized in all the provinces and regions of Pakistan. With inputs from these consultative meetings and dialogues; UNHABITAT will work with MoCC to draft a National Urban Policy and strategy. that is sensitized to urban resilience. Stakeholders, including citizens, will be invited to give comments on the draft policy before its presentation to Federal Cabinet for approval.
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## F. 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, and are aligned with priority areas identified by the Government of Pakistan. However, the target sites are also influenced by climate change related work of development partners (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	Focus on addressing GLOF impacts in the north  Lessons: use human centred and livelihood strengthening approach. General approach: 80 percent of flood issues can be addressed through spatial planning and resilient building	Non-duplication: Project is in other target area and focuses on GLOFS. As recommended (through consultation) take approach as recommended
UNDP Green Climate Fund - Scaling up of Glacial Lake Outburst Flood (GLOF) risk		

reduction in Northern Pakistan (US\$37m)	design / regulations. There is a huge need and scope for water harvesting, also in path of floods	
UNDP Water Project Pakistan 2011-2012	<p>Improve the water supply in flood-affected areas in twelve districts all over Pakistan.</p> <p>Lessons: Over 200 solar water pumping systems were installed to provide thousands of families and animals with clean and safe drinking water. Intervention is not very cost-effective.</p>	<p>Non-duplication: Project was in other target areas.</p> <p>Complimentary: PV technique will be considered in feasibility studies.</p>
Rawalpindi		
<p>UNDP Pakistan</p> <p>Urban Poverty Alleviation Project (UPAP) in Rawalpindi 2007-2008</p>	<p>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</p> <p>Lessons: Community engagement needs to be strategically planned and should aim to secure ownership. 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.</p>	UPAP and REIP also covered some of those areas which are being proposed for this Adaptation Project.
<p>Asian Development Bank</p> <p>Technical support and financial assistance for Rawalpindi Environmental Improvement Project (REIP)</p>	<p>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.</p> <p>Lessons:</p>	

<p>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.</p>	<p>Besides these measures, the local municipal institution undertook annual cleaning of the Lai especially prior to the monsoon season.</p> <p>Lessons: 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 wastewater into Lai.</p>	<p>Complimentary: Projects in target areas will be well coordinated with JICA and government bodies.</p>
<p>Rawalpindi Water and Sanitation Agency (WASA) is currently implementing the following relevant projects:</p> <p>Lai Nallah Protection, Dredging/Desilting Work (Phase 1) (PKR 197.13 million)</p> <p>Extension of Water Facilities in Extended Controlled Area Recently notified by Punjab Government (PKR 250 million)</p>	<p>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</p>	
<p>NUST authorities three small lakes known as NUST Lake for storing rainwater by building a small wall.</p> 	<p>These dams collect water from the rain falling within the campus over a small area as catchment area.</p> <p>Lessons: These lakes are being used as fish ponds and as source for charging the groundwater level of the tube well of the campus. This is a very good example of water harvesting.</p>	<p>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</p>
<p>World Vision</p> <p>Financial support to communities in Rawalpindi for installation of water pumps for extraction of groundwater for household consumption.</p>	<p>Installation of water pumps for extraction of groundwater for household consumption</p> <p>Lessons: World Vision could not provide a sustainable solution to address drinking water scarcity crisis in the communities. The project 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. The project ended and should not focus on pumps for groundwater</p>	



Nowshera		
Government of Pakistan, Ministry of water resources  1253 re-modelling 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		
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

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 groundwater though the quality of groundwater is not fit for human consumption.

### ***G. 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.

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 plan, construct, operate, maintain and duplicate flood resilient water harvesting systems, using innovative techniques. Participatory approach (involving communities in planning, implementation and monitoring 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 to identify water management structures recommended on other critical interlinked structures through spatial planning and 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)  50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed	(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, operate, maintain and replicate best practice water harvesting facility as part of spatial planning strategies
Output 2.3.  50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity developing 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 guidelines and tools.	(lo): Concerned government officers have capacity to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning guidelines and 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 guidelines and tools.
Output 3.2.  One National urban strategy focused on climate change / disaster risk reduction developed  One set of National guidelines for spatial 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 focused on climate change / disaster risk reduction developed  National guidelines for spatial 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.



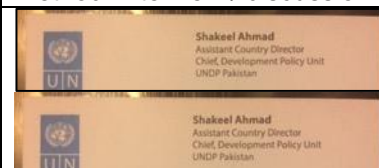
## **H. Consultative process**




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 group 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
<b>Mr. Khizar Hayat Khan</b> Federal Secretary Ministry of Climate Change (MOCC)	<ul style="list-style-type: none"> <li>- Align proposed project with national priorities</li> </ul>	<ul style="list-style-type: none"> <li>- Very welcoming to a project that addresses water scarcity (new priority) and flooding</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on water scarcity and flood issues</li> </ul>	 <p>Date: 04-06-2018 Method: interview / discussion</p>
<b>Mr Irfan Tariq</b> DG and AF focal point Ministry of Climate Change	<ul style="list-style-type: none"> <li>- Align proposed project with national priorities</li> <li>- Agree on way forward</li> </ul>	<ul style="list-style-type: none"> <li>- Priority issues: water scarcity (new priority) and flooding</li> <li>- Name of ministry will be changed to climate change and human settlements – so more urban focus</li> <li>- Request to develop a national urban policy</li> <li>- Priority town: Nowshera</li> <li>- Also, water scarcity issue in Islamabad and Rawalpindi – technique needed to conserve / harvest water + urban planning</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on water scarcity and flood issues</li> <li>- National urban policy and urban planning strategies to reduce climate change impacts (floods and droughts) part of project</li> <li>- Focus on Nowshera if feasible. Consider Islamabad and Rawalpindi if vulnerable area</li> </ul>	 <p>Date: 04-06-2018 Method: interview / discussion</p>
<b>Lt. Gen Omar Mahmood Hayat</b> Chairman National Disaster Management Authority MOCC	<ul style="list-style-type: none"> <li>- Align proposed project with national priorities</li> <li>- Understand main disaster / cc issues</li> </ul>	<ul style="list-style-type: none"> <li>- Cities are not planned for floods and water</li> <li>- Land use plans and building codes needed to avoid people moving into risk areas and building codes to construct resilient</li> </ul>	<ul style="list-style-type: none"> <li>- Include land use planning strategy and resilient building codes components in the project</li> </ul>	





<b>Fiaz Hussain Shah</b> Director General National Institute of Disaster Manage- ment MOCC		houses - Suggested to focus more south compared to donor focus on tribal / northern areas		 <p>Date: 04-06-2018 Method: interview / discussion</p>
<b>Ms. Ingrid Christensen</b> Country head ILO	- 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	 <p>Date: 04-06-2018 Method: interview / discussion</p>
<b>Abid Niaz Khan</b> National programme coordinator				
<b>Mr. Shakeel Ahmad</b> Chief Development unit 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	 <p>Date: 04-06-2018 Method: interview / discussion</p>
<b>Amanullah Khan</b> Chief Environment and climate change UNDP				
<b>Mr. Illango Pathchamuthu</b> Country director	- Understand main disaster /	- Need of land use planning and building codes, especially in	- Include land use planning and building codes	


World Bank	<ul style="list-style-type: none"> <li>- cc issues</li> <li>- Map lessons learned other projects</li> </ul>	<ul style="list-style-type: none"> <li>- Punjab</li> <li>- Need to address issue of water scarcity in Karachi (due to salt water)</li> <li>- Use lessons from some 2-3 relevant flood-related projects</li> </ul>	<ul style="list-style-type: none"> <li>- component in project</li> <li>- Use lessons learned from flood-related project</li> </ul>	
<b>Amena Raja</b> Operations officer World bank				Date: 05-06-2018 Method: interview / discussion
<b>Mr. Ahmed Kamal</b> Chief Engineering Advisor & Chairman Federal Flood Commission Ministry of Water Resources	<ul style="list-style-type: none"> <li>- Align proposed project with national priorities</li> <li>- Understand main disaster / cc issues</li> </ul>	<ul style="list-style-type: none"> <li>- Most relevant policies / plans: National flood protection plan and National water policy – priorities are water scarcity and floods</li> <li>- ADB, JICA and WWF (GCF) interested in flood plan</li> <li>- Suggest combining local water harvesting knowledge / techniques with world and regional best practices to improve system and clean water</li> <li>- Suggest developing a city water management model and to raise public awareness about water scarcity / conservation needs</li> <li>- Co-funding from government is option</li> </ul>	<ul style="list-style-type: none"> <li>- Fully align with National flood protection plan and National water policy</li> <li>- Avoid overlap with ADB and JICA projects</li> <li>- Focus on combining local water harvesting knowledge / techniques with world and regional best practices to improve system and clean water</li> <li>- Consider developing a city water management model – perhaps as part of national urban policy</li> <li>- Explore options of co-funding from government</li> </ul>	
<b>Ms. Fareeha Umam</b> Programme specialist UN Women	<ul style="list-style-type: none"> <li>- Identify main potential gender related risks</li> <li>- Understand main gender needs in Pakistan</li> </ul>	<ul style="list-style-type: none"> <li>- Legal status: consider potential risk of 'violence against women (domestic) and harassment.</li> <li>- 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 mindsets</li> </ul>	<ul style="list-style-type: none"> <li>- Ensure safety and health are guaranteed during activities</li> <li>- Include women in decision-making processes, where possible</li> <li>- Focus on women with water-related activities – also with skills and capacity focus</li> <li>- Work with national</li> </ul>	

		<ul style="list-style-type: none"> <li>- Women are generally water 'handlers'</li> <li>- Suggest working with national commission 'status of women' and gender focal points within NDMA and departments</li> <li>- Suggest focussing on skills + capacity development</li> </ul>	<ul style="list-style-type: none"> <li>- commission 'status of women' and gender focal points within NDMA and departments</li> <li>- Consider working with Lahore women university</li> </ul>	<p>Date: 05-06-2018 Method: interview / discussion</p>
<p><b>Mr. Hussain Ullah</b> Head of preparedness unit OCHA</p>	<ul style="list-style-type: none"> <li>- Identify main potential human right risks</li> <li>- Understand main issues and needs when it comes to disaster preparedness and response</li> </ul>	<ul style="list-style-type: none"> <li>- Main issue: water scarcity – there is no proper water and floods management system and the most vulnerable are hit hardest</li> <li>- Punjab has good data</li> <li>- Sindh has a governance gap</li> <li>- Balochistan has some good water scarcity coping strategies – but question is how to purify water</li> <li>- Suggest to carefully study landscape requirements for water harvesting</li> <li>- NDMA has good report identifying most hazard impacts vulnerable areas</li> </ul>	<ul style="list-style-type: none"> <li>- Focus on water scarcity issue</li> <li>- Identify areas appropriate for water harvesting (with slope)</li> <li>- Use NDMA data to identify target area with above</li> </ul>	 <p>Date: 05-06-2018 Method: interview / discussion</p>
<p><b>Ms. Almas Saleem</b> Executive director SheherSaaz NGO</p> <p><b>Abdul Shakoor Sindhu</b> Chief Technical Advisor SheherSaaz NGO</p>	<ul style="list-style-type: none"> <li>- Identify main urban climate change and disaster issues</li> <li>- Identify potential target areas based on assessments</li> <li>- Discuss cooperation options</li> </ul>	<ul style="list-style-type: none"> <li>- Main issues floods and water scarcity</li> <li>- Suggest focussing on Nowshera and Rawalpindi as both (flash) floods and water scarcity are issues</li> <li>- SheherSaaz is only NGO in Pakistan that focuses on urban issues in a comprehensive way</li> <li>- Agreement on cooperation on consultations</li> </ul>	<ul style="list-style-type: none"> <li>- Assess Nowshera and Rawalpindi as best target areas</li> <li>- Work together on consultations</li> </ul>	 <p>Date: 06-06-2018 Method: interview / discussion</p>


<p><b>Initial local government and community representatives' consultation</b> Nowshera</p>	<ul style="list-style-type: none"> <li>- Understand main climate change related impacts and specific effects and barriers to adapt</li> <li>- Identify main issues and needs</li> <li>- Understand main concerns</li> <li>- Identify targets communities</li> <li>- Identify possible interventions</li> </ul>	<ul style="list-style-type: none"> <li>- Concerns of the poor don't reach the government</li> <li>- Impact: 2-meter flood (river -north side - and flash – from mountains 10 km away – south side) leading to death and destruction</li> <li>- Most difficult to adapt / recover: business, contaminated water, unhygienic situation</li> <li>- Priorities / needs regarding floods: 1) safety, 2) water (contamination) and food, 3) housing, crops, cattle (destroyed)</li> <li>- Water source: wells</li> <li>- 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.</li> <li>- Most affected communities:</li> </ul>	<ul style="list-style-type: none"> <li>- Consider inputs in project design.</li> </ul>	  <p>Date: 06-06-2018 Method: group discussion</p>
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<p><b>Initial local government and community representatives' consultation</b></p> <p>Rawalpindi union council 4-5-6</p>	<ul style="list-style-type: none"> <li>- Understand main climate change related impacts and specific effects and barriers to adapt</li> <li>- Identify main issues and needs</li> <li>- Understand main concerns</li> <li>- Identify targets communities</li> <li>- Identify possible interventions</li> </ul>	<ul style="list-style-type: none"> <li>- Impact: floods up to 1<sup>st</sup> 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</li> <li>- Most difficult to adapt / recover: contaminated water (using boreholes – there is a lot of waste.</li> <li>- Priorities / needs regarding floods: 1) safety (especially children falling and in and elderly, 2) water (contamination)</li> <li>- Need to reduce flood water from source (as very dense area; need clean water year-round in communities;</li> <li>- Most affected communities: union councils 4-8 + further along the channels (10 km)</li> </ul>	<ul style="list-style-type: none"> <li>- Consider inputs in project design.</li> </ul>	 <p>Date: 07-06-2018 Method: group discussion</p>
<p><b>Mr Irfan Tariq</b> DG and AF focal point Ministry of Climate Change With representatives from SheherSaaz</p>	<ul style="list-style-type: none"> <li>- Agree on main approach, components and target areas</li> <li>- Agree on steps / way forward</li> </ul>	<ul style="list-style-type: none"> <li>- Agreement on main approach and components – will review document</li> <li>- Agreement on main steps / way forward – will send letters to target municipalities to get their official buy-in</li> <li>- Include Islamabad by-law on water harvesting in building design in project design</li> </ul>	<ul style="list-style-type: none"> <li>- See left</li> </ul>	 <p>Date: 08-06-2018 Method: interview / discussion</p>




<p><b>Rawalpindi community consultations</b></p> <p>Rawalpindi union council Union Councils 4-5-6</p>	<ul style="list-style-type: none"> <li>- Understand climate change related issues and needs in target areas</li> </ul>	<ul style="list-style-type: none"> <li>- Flooding, diseases and droughts / water scarcity are all getting a lot worse and water scarcity is the most pressing issue</li> </ul> <p>Water scarcity specific issues:</p> <ul style="list-style-type: none"> <li>- 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</li> <li>- 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.</li> <li>- Scarcity of water is also a source of feuds among neighbours.</li> </ul> <p>Diseases specific issues:</p> <ul style="list-style-type: none"> <li>- Contaminated water is a source of number of water-borne diseases including diarrhoea, gastro and hepatitis to name a few.</li> </ul> <p>Flood specific issues:</p> <ul style="list-style-type: none"> <li>- Floods are recurrent phenomenon thanks to the close proximity of Lai Nallah and presence of some natural drains.</li> <li>- 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.</li> </ul> <p>Barriers for adaptation:</p> <ul style="list-style-type: none"> <li>- Dependence on (polluted) groundwater of which the water table has gone down dramatically</li> <li>- Absence of water sector planning at various levels and lack of awareness and technical support.</li> <li>- People do not have a control on quality of water being supplied through municipal authorities as well as water vendors</li> <li>- Lack of waste management leading to more flood risks and groundwater pollution</li> </ul>	 <p>Date: 04-07-2018 Method: discussion and survey (see annex 1)</p>
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<p><b>UN gender working group</b></p> <p>UNIC UNIDO UNDP UNDSS UN-Habitat Shehersaaz</p>	<ul style="list-style-type: none"> <li>- Understand main gender specific related issues and needs regarding climate change, also in target areas</li> </ul>	<p>Identified Challenges for women to adapt to climate change vulnerabilities</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Women are often absent from trainings for disaster management.</li> <li>- 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.</li> <li>- 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.</li> <li>- Mobility problems during floods</li> <li>- There exists no mechanism to communicate with women groups</li> </ul>	<p>Measures Proposed for strengthening adaptive capacity of women</p> <ul style="list-style-type: none"> <li>- Make them part of Awareness campaigns</li> <li>- Prepare reading material and videos for them in local languages</li> <li>- Train women to use technologies for water harvesting</li> <li>- 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.</li> <li>- Improve the knowledge, skills and behaviours of vulnerable women for a good quality warning, evacuation, shelter and rehabilitation mechanism.</li> <li>- Build the capacities of national and local women's groups' and provide them with a platform to be heard and to lead</li> <li>- Development of a women volunteers' team within each community to address women and girls special needs</li> <li>- Mainstreaming gender into policy processes, programmes and projects can help ensure that such</li> </ul>	 <p>Date: 31-07-2018 Method: discussion</p>
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			<p>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.</p> <ul style="list-style-type: none"><li>- Consider the level of women's access to technology and finances, health care, support services, shelter and security in times of disaster.</li></ul>	
<p><b>Rawalpindi women consultations</b></p> <p>Rawalpindi union council Union Councils 4-5-6</p>	<ul style="list-style-type: none"><li>- Understand main gender specific related issues and needs regarding climate change in target communities</li></ul>	<ul style="list-style-type: none"><li>- Flooding, diseases and droughts / water scarcity are all getting a lot worse</li></ul> <p>Flood specific issues:</p> <ul style="list-style-type: none"><li>- Women being responsible for housekeeping put a lot of effort and time in cleaning their houses whenever they are affected by flood-waters.</li><li>- The monsoon season brings fear and especially women have to stay extra conscious spending sleepless nights.</li></ul> <p>Disease specific issues:</p> <ul style="list-style-type: none"><li>- 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.</li></ul> <p>Water scarcity specific issues:</p> <ul style="list-style-type: none"><li>- Women have to travel almost two kilometers to bring drinking water from two nearby water sources--private boreholes.</li></ul> <p>Barriers for adaptation:</p> <ul style="list-style-type: none"><li>- Women are not involved in any community-based decision making.</li><li>- 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.</li></ul>	 <p>Date: 01-08-2018 Method: discussion and survey (see <a href="#">annex 1</a>)</p>	

		<ul style="list-style-type: none"> <li>- Most of the households are poor and disease burden is high. No social safety nets or subsidized healthcare facilities are available to households.</li> <li>- 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.</li> <li>- Generally, households do not have knowledge of household level low cost but effective water purification technologies.</li> </ul> <p>Concerns:</p> <ul style="list-style-type: none"> <li>- They fear that flood protection measures involving removal of encroachments from Lai Nallah's banks may lead to their displacement.</li> <li>- 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.</li> </ul> <p>Women skills, strengths and leaders</p> <ul style="list-style-type: none"> <li>- The sense of togetherness can be transformed into effective women / community organization and can be encouraged to undertake community driven or community led initiatives.</li> </ul>	
<b>Nowshera community consultations</b>  Nowshera Kalan	Understand climate change related issues and needs in target areas	<ul style="list-style-type: none"> <li>- Flooding, diseases and droughts / water scarcity are all getting a lot worse and water scarcity is the most pressing issue</li> </ul> <p>Water scarcity specific issues:</p> <ul style="list-style-type: none"> <li>- The available water from municipal supplies stinks and is highly contaminated.</li> <li>- The groundwater up to the depth of 100 ft is not fit for human consumption.</li> <li>- The poor households not being able to afford water purification / filtration systems are compelled to consume contaminated water</li> <li>-</li> </ul> <p>Flood specific issues:</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- 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.</li> </ul> <p>Disease specific issues:</p> <ul style="list-style-type: none"> <li>- Contaminated water is a source of number of water borne diseases including diarrhoea, gastro and hepatitis to name a few.</li> </ul>	 <p>Date: 01-08-2018  Method: discussion and survey  (see <a href="#">annex 1</a>)</p>

		<p>Barriers for adaptation:</p> <ul style="list-style-type: none"> <li>- Especially poor and lower middle-income households can't afford to install boreholes to extract groundwater from safer depths</li> <li>- Households generally are not aware of household level low cost water treatment technologies</li> <li>- The communities are not familiar with community-based flood management measures.</li> <li>- The river and the water channels have been turned into dumping points for city's solid waste.</li> </ul>	
<p><b>Mohammad Shakeel Malik</b> Federal Secretary Ministry of Climate Change (MOCC)</p>	<ul style="list-style-type: none"> <li>- Get feedback on the proposal before final endorsement</li> </ul>	<ul style="list-style-type: none"> <li>- Include water purification and waste management approach in the proposal</li> </ul>	<p>Date: 06-08-2018 Method: discussion</p>

## ***I. 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 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 2012-13 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. Household level rainwater harvesting systems provide adaptive solution to poor access to clean water due to flooding. Rainwater harvesting can be tapped both at household level and in public building and gardens for public use such as schools, hospitals and parks. 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
<p>Output 1.1. (concrete)</p> <p>5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques</p> <p>Output 1.2.</p> <p>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</p>	<p>Communities in target cities don't have the capacity to plan, operate, maintain and duplicate community and household-level water harvesting facilities, which are urgently needed to respond to clean water needs.</p>	<p>The proposed activities / interventions under component 1 will allow communities, and especially women and youth in target cities to plan, operate, maintain and duplicate community and household-level water harvesting facilities, which are urgently needed to respond to drought / clean water needs.</p>	<p>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.</p>
<p>Output 2.1. (concrete)</p> <p>50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed</p> <p>Output 2.2.</p> <p>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</p>	<p>District and city government officials in target cities don't have the capacity to plan, operate, maintain and duplicate 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</p>	<p>The proposed activities / interventions under component 2 will allow city government officials to plan, operate, maintain and duplicate water harvesting facilities, taking into account flood and drought risks through spatial planning strategies / decision-making</p>	<p>Alternative adaptation scenarios are resettlement or the construction of larger drainage channels, which are not feasible from a cost perspective and environmental and social risk point of view and will also not have the benefit of water supply. Due to the severe historical flood impacts, community-level flood reduction interventions won't reduce flood impacts enough.</p>



<p>Output 2.3.</p> <p>50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and houses and to enhance capacity developing spatial plans</p>			
<p>Output 3.1.</p> <p>100 government officials (women and men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning guidelines and tools.</p> <p>Output 3.2.</p> <p>One National urban strategy focused on climate change / disaster risk reduction developed</p> <p>One set of National guidelines for spatial planning considering climate change / disaster risks developed</p>	<p>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.</p>	<p>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</p>	<p>Alternative adaptation scenarios are a focus on the development of sub-national strategies, but this will reduce the complete government buy-in, including budgets.</p>

## **J. 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, mitigated during the full proposal development phase.

### **Economic sustainability**

Investing in increasing the resilience of vulnerable assets is a sustainable economic approach. It will reduce future costs related to drought and flood impacts. The national strategies, as well as community plans will consider economic opportunities. The project will ensure that material used for community and district/city level rainwater harvesting facilities are bought from local markets to strengthen the local economy. Further, end-user and in-house capacity building to plan, construct, operate, maintain and duplicate rainwater facilities will reduce cost and extend life of the concrete intervention. [Annex 5](#) proposes a way forward to transform development of rainwater harvesting facilities into a viable business model and mainstream urban adaptation into policies.

Inter alia, [annex 5](#) gives estimates for costs, amount of harvested water and pay-back time for rainwater harvesting facilities. For example, a study titled Rainwater Harvesting Potential—A contribution to sustainable water management strategy (2013) makes calculations for Lahore—the capital city of Punjab Province in these words, “Consider that 2/3rd (327 litres per capita x 2/3=218 litres per capita per day) of the daily water consumption is used for gardening, car washing, flushing, house cleaning, and laundry etc. then the harvested rainwater can be made available for the population (1,023, 510) of Lahore city under Lahore Development Authority is approximated as 96 days (appx.3.2 months)”. For the sake of convenience, if similar estimation is generalized for Rawalpindi and Nowshera, the harvested water can suffice for three months’ water consumption of a household. If PKR 3000 is taken as the cost of water a household actually have to pay for getting water, a household can save PKR 9,000 per annum. If PKR 50,000 is taken as the cost of rainwater harvesting system, the investment will return in about 5 ½ years.

### **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, mitigated 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. [Annex 5](#) proposes an approach for mainstreaming urban adaptation into national building codes and 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. This is an inclusive group of elected community members from the rainwater harvesting households to a) monitor the usage of

rainwater 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 encourages women participation in SWCs. Community training will be provided to SWCs and operations manual for SWC will be developed and orientation will be 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)  50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed	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.	Guide developed and widely used tools

50 government officials trained and guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity developing spatial plans	localized/updated to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and to enhance capacity developing 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 guidelines and tools.	
Output 3.2.  One National urban strategy focused on climate change / disaster risk reduction developed  One National guidelines for spatial 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.

## ***K. 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 1.1 and 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
<i>Compliance with the Law</i>	x	
<i>Access and Equity</i>	x	
<i>Marginalized and Vulnerable Groups</i>	x	
<i>Human Rights</i>	x	
<i>Gender Equity and Women's Empowerment</i>	x	
<i>Core Labour Rights</i>	x	
<i>Indigenous Peoples</i>	x	
<i>Involuntary Resettlement</i>	x	
<i>Protection of Natural Habitats</i>	x	
<i>Conservation of Biological Diversity</i>	x	
<i>Climate Change</i>	x	
<i>Pollution Prevention and Resource Efficiency</i>	x	
<i>Public Health</i>	x	
<i>Physical and Cultural Heritage</i>	x	
<i>Lands and Soil Conservation</i>		x

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

### A. Record of endorsement on behalf of the government<sup>43</sup>

<i>Muhammad Irfan Tariq, Director General, Ministry of Climate Change, Government of Pakistan</i>	<i>Date: January 7, 2019</i>
<i>Ahmad Kamal, Chief engineer advisor / chairman FFC/CE(DSC), Ministry of Water Resources, Government of Pakistan</i>	<i>Date: January 7, 2019</i>

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<sup>6</sup>. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.



Tele # 9245528  
Fax # 9245533

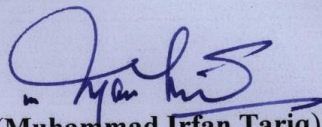


*F.No 6(2)2006-Arch.  
Government of Pakistan  
Ministry of Climate Change  
LG & RD Building  
Islamabad*

Islamabad the 7<sup>th</sup> January 2019

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's revised Project 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



ADAPTATION FUND

Letter of Endorsement by Government



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 1st August, 2018

7 January 2019

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

Subject: Endorsement for the project proposal: 'Enhance community, local and national-level urban climate change resilience to water scarcity, caused by floods and droughts in Rawalpindi and Nowshera, Pakistan.'

In my capacity as Chief Engineer Advisor of the Ministry of Water Resources in Pakistan, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Rawalpindi and Nowshera.

Accordingly, I am pleased to endorse the above project/ proposal with support from the Adaptation Fund. If approved, the project will be implemented by UN-Habitat and executed by the Ministry of Water Resources and the Ministry of Climate Change – through establishment of PMU; NDMA and local line departments and Shehersaaz NGO.

Sincerely,

Mr. Ahmad Kamal,  
Chief engineer advisor / chairman FFC/CE(DSC),  
Ministry of Water Resources,  
Government of Pakistan

**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 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 Rungtong* DIC.

*Raf Tuts,  
Director, Programme Division, UN-Habitat*

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## 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 discussions were 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. chair-person union 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 <a href="#">Part II.H</a>
Date assessment conducted	04 July 2018



Attendance sheet filled	See below
Photos of consultation made	See <a href="#">Part II.H</a>

## 2. Community profile

<b>Provincial, District and municipal name</b>	Province: Punjab; District: Rawalpindi; Municipality: Rawalpindi Municipal Corporation	
<b>Community / union council name</b>	Dhok Mangtaal (UC 4); Dhok Hassu North (UC 5); and Dhok Hassu (UC 6)	
<b>Location (on map)</b>	Please see attached map	
Total population (number)	Please see table above	
Number or percentage  (please identify vulnerable groups in target areas – through discussion and data collection)	Female	47%
	< 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: <ul style="list-style-type: none"> <li>• Tap water: 65-70%</li> <li>• Hand pumps: 2%</li> <li>• Boreholes: 25%</li> <li>• Wells: 1-2%</li> <li>• Water vendors: 5%</li> </ul>	
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 wastewater, 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.

## 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:
Droughts (e.g. lack of clean water for household use, damage to crops)	i) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , 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) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) <b>little worse</b> , iii) same, iv) better, v) not relevant, vi) can't say
River flood (directly from main river)	i) Yes, a lot, ii) <b>yes, a little</b> , iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) <b>same</b> , iv) better, v) not relevant, vi) can't say
Flash flood (local flooding due to poor drainage)	i) Yes, a lot, ii) <b>yes, a little</b> , iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) <b>same</b> , 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) <b>yes, a little</b> , iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) <b>same</b> , iv) better, v) not relevant, vi) can't say
Diseases (e.g. dengue, malaria, diarrhea)	i) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , 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	

## 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 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, need to invest in protection, need to find other income)	Who (what group) is most affected?	How does hazard impact those most affected?
Water Scarcity	<p>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.</p> <p>Water vendors have installed private filtration plants and deliver a 20-liter container of water for PKR 50 (US\$ 0.5)</p> <p>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.</p> <p>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</p>	<p>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.</p>	<p>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.</p> <p>Cost of water is too high for poor households and it takes away a considerable portion of their meager incomes.</p> <p>With water available in limited quantities, poor households also have to compromise their hygiene needs which in turn affect their health.</p> <p>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.</p>

	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.		
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 and hepatitis to name a few.	The poor households are among the most affected as they prefer quantity over quality while getting water as charity from their well off neighbors.	
Floods	<p>Floods are recurrent phenomenon thanks to the close proximity of Lai Nallah and presence of some natural drains.</p> <p>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.</p> <p>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.</p>	<p>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.</p> <p>During rainy season the houses located next of Lai Nallah and other drains get affected almost annually.</p>	

#### 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	<ol style="list-style-type: none"> <li>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)</li> <li>2) in what ways has your community already adapted to deal with these issues?</li> </ol>	Ranking most important factors
Water scarcity	<p>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 have to dig as deep as 300 feet and even more. In many cases even going to this much depth does not avail any result.</p> <p>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 tenants. For this status they cannot make an investment in water bores and hence have to depend upon their house owners.</p> <p>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</p>	<ol style="list-style-type: none"> <li>1. Absence of water sector planning at various levels.</li> <li>2. Absence of large-scale</li> </ol>

	<p>about drawing water from River Indus at the point of Ghazi Brotha located in neighbouring 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 lengthy process.</p> <p>Households have not thought of rainwater harvesting options at community or household level. This is largely due to lack of awareness and technical knowhow.</p> <p>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.</p>	<p>investments in water sector development</p> <p>3. Lack of awareness and technical support.</p>
Water borne diseases	<p>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.</p> <p>Adaptation. Households who can afford have installed water filters while some also practice boiling of water before consumption for drinking purposes.</p>	
Floods	<p>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 exist, they have to resort to open dumping of waste.</p> <p>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.</p>	

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	<ul style="list-style-type: none"> <li>• Construction of new dams</li> <li>• Rehabilitation of existing tube wells</li> <li>• Installation of new tube wells.</li> <li>• Financial support to households for installation of hand pumps and boreholes.</li> </ul>	<p>Rehabilitation of existing tube wells</p> <p>Installation of new tube wells</p> <p>Financial assistance to poor</p>

	<ul style="list-style-type: none"> <li>Drawing water from Kohala, a point at the confluence of Murree and Azad Jammu and Kashmir (AJK) where river Jehlum enters Punjab from AJK.</li> <li>Drawing water from Ghazi Brotha, a water works at River Indus in neighbouring Attock district.</li> </ul>	households for installation of hand pumps and boreholes.
Water borne diseases	<ul style="list-style-type: none"> <li>Replacement of ageing water supply pipes</li> <li>Laying of water supply pipes in a manner that they are not close to sewerage system.</li> <li>Installation of water filtration plants and their regular maintenance</li> <li>Financial assistance to poor households for installation of domestic water filtration systems.</li> <li>Boiling/disinfection of water before consumption.</li> <li>Awareness campaigns</li> </ul>	All of these are priorities.
Flooding	<p>Cleaning of Nallah Lai and other drains to make them free of solid waste</p> <p>Construction of retaining walls and embankments</p> <p>Deepening of the Lai Nallah's course by at least 5 to 6 feet.</p> <p>Realignment of Lai Nallah's course</p>	

#### Rawalpindi community consultation attendance sheet

Date 4 <sup>th</sup> July-18.				Community meeting - UC 06, 04, 05			
Full Name	UC #	Ph: #	Signature				
Muhammad Tufail	4	03365573867	[Signature]				
M. Gofar Mughal	UC 5	03125254885	[Signature]				
M. Riaz	UC 5	03009183731	[Signature]				
Atta-ur-Rehman Anwar	UC-6	0334-5048568	[Signature]				
Waqas Ali	UC-6	03335431427	[Signature]				
Zeeshan Ahmad	UC-4	0317-1497244	[Signature]				
Afsar Ali	UC-6	03135391729	[Signature]				
Abdul Wahab.	UC-5	03490004366	[Signature]				
Syed Israr Haider	UC-5	03365575554	[Signature]				
Tayyab Riaz	UC-5	0334-5254572	[Signature]				



## 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) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say
Diseases (e.g. dengue, malaria, diarrhea)	i) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , 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) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , 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) <b>yes, a little</b> , iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) <b>little worse</b> , 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	Persistent 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



drinking and household use		groundwater extracted through boreholes also is not of good quality.
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### 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 house-keeping 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.
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### 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	<p>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</p> <p>4) in what ways has your group already adapted to deal with these issues?</p>
1. Flooding	<ul style="list-style-type: none"> <li>- The location of Dhok Najju that makes it an immediate neighbor of Lai Nallah poses a persistent risk of flooding.</li> <li>- Over the years, the community has encroached the banks of Lai Nallah and hundreds of households are compelled to live in the flood zone.</li> <li>- The municipal authorities have not made any efforts so far to enforce building codes and land use control.</li> <li>- A proper sewerage system does not exist. Household sewage flows in open street sewers before its final disposal in Lai Nallah.</li> <li>- No effective early warning system exists.</li> <li>- 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.</li> <li>- Effective community-based governance and decision making systems do not exist. Women are not involved in any community-based decision making.</li> <li>- 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.</li> </ul> <p>Adaptation:</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Flood warnings are aired from loudspeakers of mosques. However, these do not prove very effective.</li> </ul>
2. Diseases/ Epidemics	<ul style="list-style-type: none"> <li>- Most of the households are poor and disease burden is high. No social safety nets or subsidized healthcare facilities are available to households.</li> <li>- 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.</li> </ul> <p>Adaptation</p> <p>So far, no visible adaptation measures are in place against this situation.</p>
3. Scarcity of clean water for drinking and other household uses	<ul style="list-style-type: none"> <li>- The community finds itself helpless against the persistent unavailability of clean water.</li> <li>- 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.</li> <li>- Generally, households do not have knowledge of household level low cost but effective water purification technologies.</li> </ul> <p>Adaptation:</p> <p>Since water available from existing municipal supplies is not drinkable, especially women travel to nearby two water sources to fetch water for drinking.</p>

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	<ul style="list-style-type: none"> <li>- Lai Nallah should be covered</li> <li>- If Lai Nallah is not covered, its walls should be lined with retaining walls</li> <li>- Government should install a proper sewerage system</li> </ul>
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	<ul style="list-style-type: none"> <li>- Install community level water filtration plants</li> <li>- Ensure the supply of clean water through municipal supplies.</li> </ul>

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.?)

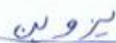


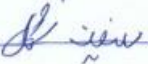
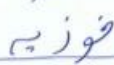


Activity / intervention	Concerns and needs
Flood protection measures involving clearance of encroachments from Lai Nallah's banks	<p>Concerns: Displacement and resettlement</p> <p>Needs: Many households are tenants. In many instances a dwelling unit is occupied by as high as seven to eight families, 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.</p>
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)	<p>1) How can this be used for addressing floods, water scarcity, etc.?</p> <p>2) Who will be the leader for making this happen? (what community committees can help with this?)</p>
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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.	This sense of togetherness can be transformed into effective community organization and can be encouraged to undertake community driven or community led initiatives.
Many households 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

Attendance Sheet Rawalpindi - Dhok Najju P.1			
Full Name	UC#/Name Dhok Najju	Ph. #	Signature
1- Emenfadal.	UC 19	03105142618	
2- Iqbal Paitori	UC 19	0331-5091971	
3- 	UC 19	03055124319	
4- 	UC 19	03468733866	Khalida
5- 	"		
6- 	UC 19	03105142618	Uzma
7- 	UC 19	03465234738	Fozia
8- 	UC 19	03109294850	Alia
9- 	UC 19	03115096301	Shahmeera
10- Naseem Bibi	"	03315504463	Dr.
11- Naseem Hukmudad	"	0300-9739629	

(P-2)

Name	VC #	Name	Ph. #
12 - Tasleem	19		0343-386785
13 - Shamim Akhtar	4		0311-5172379
14 - Mehnaz Bibi	1		0342-8541843
15 - Perveen Akhtar	4		0312-5001696
16 - Uzma	4		0314-9526074
17 - Sarina	4		0316-0907636
18 - Fehmida Khatun	4		0311-5469260
19 - Shehnaaz	1		0311-5558974
20 - Rukhsana	1		

## 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 <a href="#">Part II.H</a>

#### 2. Community profile

<b>Provincial, District and municipal name</b>	Province: Khyber Pakhtunkhwa District: Nowshera Municipality: Tehsil Municipal Administration (TMA), Nowshera	
<b>Community / union council name</b>	Union Council: Nowshera Kallan	
<b>Location (on map)</b>	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) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , ii) little worse, iii) same, iv) better, v) not relevant, vi) can't say.
River flood (directly from main river)	i) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) a lot worse, ii) little worse, iii) <b>same</b> , iv) better, v) not relevant, vi) can't say
Diseases (e.g. dengue, malaria, diarrhea)	i) <b>Yes, a lot</b> , ii) yes, a little, iii) no, iv) not relevant. v) can't say.	i) <b>a lot worse</b> , 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 groundwater up to the depth of 100 ft is not fit for human consumption. Going further deep one may get somewhat cleaner and purer water.
2. River flooding	Persistent risk. The biggest flooding event in the known	River Kabul flows through the city. The old city (which is proposed to be targeted with

	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	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, cholera 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 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, 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 wastewater 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 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.	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.	<p>Incidences of diarrhea are high among the infants and younger children.</p> <p>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.</p> <p>Prevalence of hepatitis is also very high. This situation has caused a number of deaths. Local residents attribute the poor quality of drinking water as being the main reasons for this situation.</p> <p>Poor households have to allocate a considerable portion of</p>

	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.		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. 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.	Poor households are among the most affected ones. Infants and younger children get most affected by water borne 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	<p>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)</p> <p>6) in what ways has your community already adapted to deal with these issues?</p>
1. Drought/ scarcity of clean water for human consumption	<ul style="list-style-type: none"> <li>- 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.</li> <li>- The community members find them helpless in getting rid of this issue.</li> <li>- The elected representatives make promises at time of elections but have so far not taken any meaningful steps to fulfill citizens' demands.</li> <li>- 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</li> <li>-Households generally are not aware of household level low cost water treatment technologies as is apparent from lack of availability of these technologies.</li> <li>- Water harvesting at community and household levels has never been considered as an option. Most of the respondents had not heard of them even.</li> </ul> <p>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.</p>
2. River flooding	<ul style="list-style-type: none"> <li>- The concerned institutions have so far not taken well planned flood mitigation measures arguing they do not have required financial resources.</li> <li>- The communities are not familiar with community-based flood management measures.</li> <li>- An effective early warning system and response mechanisms are not in place.</li> <li>- Flood resilient building codes and practices and land use controls are not in place.</li> <li>- The city has grown haphazardly in absence of any meaningful city development and management plans and strategies.</li> <li>- 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.</li> <li>- 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.</li> <li>- The city has a poor drainage system. During floods 2010, the floodwater stagnated in various low-lying areas of the city for many days.</li> <li>- 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.</li> </ul> <p>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</p>

	<p>relief. The measures that could meaningfully reduce the vulnerability of the citizens and city and enhance their capacities are simply not in place.</p> <p>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.</p> <p>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.</p>
3. Diseases/epidemics	<p>- 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.</p> <p>In the aftermaths of floods, the groundwater sources get further contaminated.</p> <p>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. Officials 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.</p> <p>City's public health system does not have capacity to fulfill citizens' health needs.</p> <p>Adaptation: - To suffer silently appears to be only adaptive strategy poor citizens have at their disposal.</p>

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 consumption	<ul style="list-style-type: none"> <li>- The concerned authorities should install deep tube wells to ensure cleaner supply of water.</li> <li>- City's water distribution system should be overhauled.</li> <li>- Water filtration plants should be installed in every neighborhood and these plants should be regularly maintained.</li> <li>- Concerned authorities should design an effective waste management plan for liquid and solid waste to stop the contamination of drinking water from them.</li> </ul>
2. River flooding	<ul style="list-style-type: none"> <li>- Construction of retaining walls and embankments.</li> <li>- Construction of check dams and water storage ponds</li> <li>- Installation of an effective flood early warning system.</li> </ul>
3. Diseases/epidemics	<ul style="list-style-type: none"> <li>- Fumigation of city on regular basis.</li> <li>- Construction of slaughter houses in a way that their waste is not disposed in the river.</li> <li>- Introduction of an effective system for management of solid and liquid waste.</li> </ul>

Nowshera community consultation attendance sheet

18 Aug. 2018

Attendence sheet. Nowshera

Full Name	UC # / Area	Ph. #	Signature
Irshad Khan Circular Inspector TMA - Nowshera	Nowshera Kalleen	03219749710	
Azeel Rehman Area Supervisor	"	0315-5879619	
Qari Wajid-ul-Haq Dist. Member.	Chowki Town	03459296666	
Mr. 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		
<p>Component 1:</p> <p>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.</p>	<p>Output 1.1. (concrete)</p> <p>5000 community / household level flood resilient (i.e. elevated to not be affected by flood water) rainwater harvesting facilities constructed, using innovative techniques</p>	<p>Rawalpindi: especially UC 4,5 and 6, but also 1,2, 12 and 37</p> <p>Nowshera Kalan (including UCs namely Nowshera City, Kabul River, Chowki Town and Nawan Kallaey)</p>	<p>Direct: 38,885</p> <p>Indirect: around 222,200</p>	See figure 15 (household level)	See figure 15 and <a href="#">annex 4</a>	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
	<p>Output 1.2.</p> <p>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</p>	<p>Rawalpindi: especially 4,5 and 6, but also 1,2, 12 and 37</p> <p>Nowshera Kalan (including UCs namely Nowshera City, Kabul River, Chowki</p>	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 any concrete infrastructure, it needs to be ensured vulnerable groups are involved and benefit equally; the number of direct training beneficiaries will be around 210 (30 per community)

	reduce waste in drainage channels through awareness raising campaigns	Town and Nawan Kal-laey)					
Component 2  Enhance city and district-level water harvesting facilities in public buildings and on water storages in public gardens, develop district / city level spatial strategies as tool to assess climate change related floods, droughts and water scarcity to plan for and manage climate change risks and to strengthen capacities to plan, construct, operate, maintain and duplicate water harvesting facilities in public buildings and gardens.	Output 2.1. (concrete)  50 district / city-level water harvesting facilities in public buildings and on water storages in public gardens constructed (or smaller number if possible)	Rawalpindi: especially UC 1,2, 4,5, 6, 12 and 37 + whole of Rawalpindi  Nowshera District	Direct: 250,000  Estimations for water use to be made	Rainwater harvesting facilities in public buildings and gardens	Rainwater harvesting facilities will be constructed in public buildings and gardens	Local government, Building Regulation Unit, Construction Department, representatives of user groups and community groups need to be involved continuously. 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	Since the intervention is on public ground and construction takes place at this level (roof) potential negative impacts are at this level and thus require full involvement of beneficiaries
	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.	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	Rawalpindi city	Direct: 50	Not relevant	Government officials trained	Representation need to be gender sensitive	

	guide developed to plan, construct, operate, maintain and duplicate flood resilient water harvesting facilities and houses and to use guidelines for spatial planning strategies as a tool to enhance capacity developing spatial plans	Nowshera city					
<p>Component 3</p> <p>Strengthen national-level capacity to guide / direct city-level development considering climate change and disaster risks and impacts, especially water scarcity caused by floods and droughts.</p>	<p>Output 3.1.</p> <p>100 government officials (women men) trained to guide / direct urban development considering climate change and disaster risks and impacts, using especially spatial planning guidelines and tools.</p>	National government	Direct: 100	Not relevant	Government officials trained	Representation need to be gender sensitive	
	<p>Output 3.2.</p> <p>One National urban strategy focused on climate change / disaster risk reduction developed</p> <p>One National guidelines for spatial planning considering climate</p>	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 be 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.

	change / disaster risks developed						
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## 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.

Based on national standards / requirements (see figure 20 below), an IEE-Regulation 3 is only required for water supply and treatment systems (figure 20, section G) but not for rainwater harvesting facilities under output 1.1 and 2.1

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

Box 3.2: The Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000, Schedule I and II			
Schedule I Requiring IEE-Regulation 3	Schedule II Requiring EIA-Regulation 4	E. Transport	D. Transport
<b>A. Agriculture, Livestock and Fisheries</b> Poultry, livestock, stud and fish farms with total cost more than Rs.10 million. Projects involving repacking, formulation or warehousing of agricultural products	—	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.	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.
<b>B. Energy</b> 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.	<b>A. Energy</b> 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.	<b>F. Water management, dams, irrigation and flood protection</b> 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.	<b>E. Water management, dams, irrigation and flood protection</b> 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.
<b>C. Manufacturing and processing</b> 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>B. Manufacturing and processing</b> 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.	<b>G. Water supply and treatment</b> Water supply schemes and treatment plants with total cost less than Rs.25 million.	<b>F. Water supply and treatment</b> Water supply schemes and treatment plants with total cost of Rs.25 million and above.
<b>D. Mining and mineral processing</b> 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.	<b>C. Mining and mineral processing</b> 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.	<b>H. Waste disposal</b> Waste disposal facility for domestic or industrial wastes, with annual capacity of less than 10,000 cubic meters.	<b>G. Waste Disposal</b> 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.
—	—	<b>I. Urban development and tourism</b> Housing schemes; Public facilities with significant off-site impacts (e.g. hospital wastes). Urban development projects.	<b>H. Urban development and tourism</b> Land use studies and urban plans (large cities) Large-scale tourism development projects with total cost of more than Rs.50 million.
—	—	<b>J. Other projects</b> Any other project for which filing of an IEE is required by the Federal Agency under sub-regulation (2) of Regulation 5.	<b>I. Environmentally Sensitive Areas</b> All projects situated in env. sensitive areas.
—	—	—	<b>J. Other projects</b> 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.<sup>44</sup>

### 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.

<sup>44</sup>Idem



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 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, OCHA, UNIC, UNIDO, UNDP, UNDSS, UN-Habitat and Shehersaaz). 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,<sup>45</sup> 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.'<sup>46</sup>

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.<sup>47</sup> As mentioned by the Committee on

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<sup>45</sup>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>

<sup>46</sup> Idem XI. Challenges 78 (page 23)

<sup>47</sup>[https://tbinternet.ohchr.org/\\_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=131&Lang=EN](https://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=131&Lang=EN)

the Elimination of Discrimination against Women<sup>48</sup> 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 reference to and agreement to comply to – universal human right in all contract and MoUs and AoCs used in the project.

As for output 1.1 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.<sup>49</sup> According to ILO representatives (see [part II.H](#)), the project should

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<sup>48</sup>Concluding observations on the fourth periodic report of Pakistan, adopted by the Committee at its fifty-fourth session (11 February–1 March 2013):

[https://tbinternet.ohchr.org/\\_layouts/treatybodyexternal/Download.aspx?symbolno=CEDAW/C/PAK/CO/4&Lang=En](https://tbinternet.ohchr.org/_layouts/treatybodyexternal/Download.aspx?symbolno=CEDAW/C/PAK/CO/4&Lang=En)

<sup>49</sup>[http://www.ilo.org/dyn/normlex/en/f?p=1000:11210:0::NO:11210:P11210\\_COUNTRY\\_ID:103166](http://www.ilo.org/dyn/normlex/en/f?p=1000:11210:0::NO:11210:P11210_COUNTRY_ID:103166)

- ☐ 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 the MoU 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 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. 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.

#### **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.

#### **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<sup>50</sup> *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<sup>51</sup>, 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.

#### **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: These assessments will also consider pollution prevention and resource efficiency. In principle the intervention promotes resource efficiency as it has a double function of ensuring safe drinking water and/ water supply and reducing stress on depleting water table, 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 1.1 and 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<sup>52</sup>:

- ☐ Archaeological Ruins at Moenjodaro

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<sup>50</sup><http://www.iucnredlist.org/search>

<sup>51</sup><http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme>

<sup>52</sup><https://whc.unesco.org/en/list/>

- ☐ 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 the community ‘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.

### **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. Determinants for gender-responsive stakeholder consultation**

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	Total: 83,567
<ul style="list-style-type: none"> <li>- Female: 47%</li> <li>- &lt; age14: 37%</li> <li>- age 15-24: 21%</li> <li>- age 25-60: 39 %</li> <li>- &gt; age 60: 3%</li> <li>- Disabled: 2%</li> <li>- Some Afghan refugee families</li> </ul>	<ul style="list-style-type: none"> <li>- Female: 48%</li> <li>- &lt; age14: 38%</li> <li>- age 15-24: 20%</li> <li>- age 25-60: 40 %</li> <li>- &gt; age 60: 2%</li> <li>- Disabled: 2%</li> <li>- 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.</li> </ul>

- ☐ 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	
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- 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 fulfilment 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
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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

<b>Province</b>	<b>District</b>	<b>Flood</b>	<b>Land Slide</b>	<b>Earth-quake</b>	<b>Tsu-nami</b>	<b>Cy-clon-e</b>	<b>Drou-ght</b>	<b>Ava-lanche</b>	<b>GL OF</b>	<b>Total Risk</b>
Khyber Pakh-tunkhawa	Shangla	5	4	5	0	2	4	5	5	30
Khyber Pakh-tunkhawa	Sawat	5	5	4	0	2	2	5	5	28
Khyber Pakh-tunkhawa	Upper Dir	4	5	4	0	2	2	4	5	26
Khyber Pakh-tunkhawa	Batagram	3	4	4	0	2	3	4	5	25
Khyber Pakh-tunkhawa	Mansehra	4	5	4	0	2	1	4	5	25
Khyber Pakh-tunkhawa	Buner	5	4	4	0	2	4	4	1	24
Khyber Pakh-tunkhawa	Charsadda	5	3	5	0	2	3	5	1	24
Khyber Pakh-tunkhawa	Mardan	5	5	5	0	2	1	5	1	24
Khyber Pakh-tunkhawa	Nowshera	5	4	5	0	2	3	4	1	24
Khyber Pakh-tunkhawa	Abbottabad	3	5	5	0	2	2	5	1	23
Khyber Pakh-tunkhawa	Peshawar	5	3	5	0	2	3	4	1	23
Khyber Pakh-tunkhawa	Swabi	5	3	5	0	2	2	5	1	23
Khyber Pakh-tunkhawa	Lower Dir	4	4	5	0	2	1	5	1	22
Khyber Pakh-tunkhawa	Haripur	3	5	4	0	2	1	4	1	20
Khyber Pakh-tunkhawa	Kohistan	3	4	3	0	1	1	4	4	20
Khyber Pakh-tunkhawa	Malakand	4	3	5	0	2	1	4	1	20
Khyber Pakh-tunkhawa	Bannu	4	2	5	0	2	4	1	1	19
Khyber Pakh-tunkhawa	Hangu	3	3	4	0	2	3	1	1	17
Khyber Pakh-tunkhawa	Chitral	3	4	2	0	1	1	2	3	16
Khyber Pakh-tunkhawa	Tank	4	1	3	0	2	4	1	1	16
Khyber Pakh-tunkhawa	D. I. Khan	5	1	2	0	2	2	1	1	14
Khyber Pakh-tunkhawa	Kohat	3	2	3	0	2	2	1	1	14
Khyber Pakh-tunkhawa	Lakki Mar-wat	3	1	3	0	2	1	1	1	12
Khyber Pakh-tunkhawa	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
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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	GL OF	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 rainwater 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**

**Singapore:** The Republic of Singapore has a land area of 61,000 hectares. 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 groundwater in Singapore include utilisation of 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 meter. 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.

**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 20m<sup>3</sup> clay lined underground cisterns in the loess (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**

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**Rainwater Harvesting in Indore:** The water supply to the town of Indore is 168 million liters per day as against the daily requirement of 320 million liters. A declining rainfall and the growing population have 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. Energized 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. In fact, 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 every day. 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 meters in size, rainwater harvesting is now compulsory. The Corporation has proposed to make rainwater harvesting mandatory for the existing buildings

### **Rainwater 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 rainwater 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 rainwater collection.

**Planning;** check the house for potential harvesting of rainwater.

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, whenever 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 re-adjusting.



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 straight.



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. (length 8-10ft).



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 place in mould as shown.



Picture of marking to be readied.

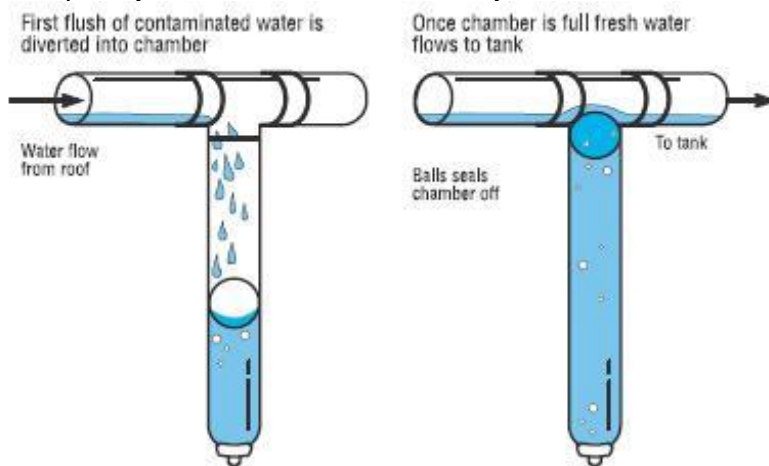




## Removing Contaminants from Collected Rainwater

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**.

## 1. 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?**

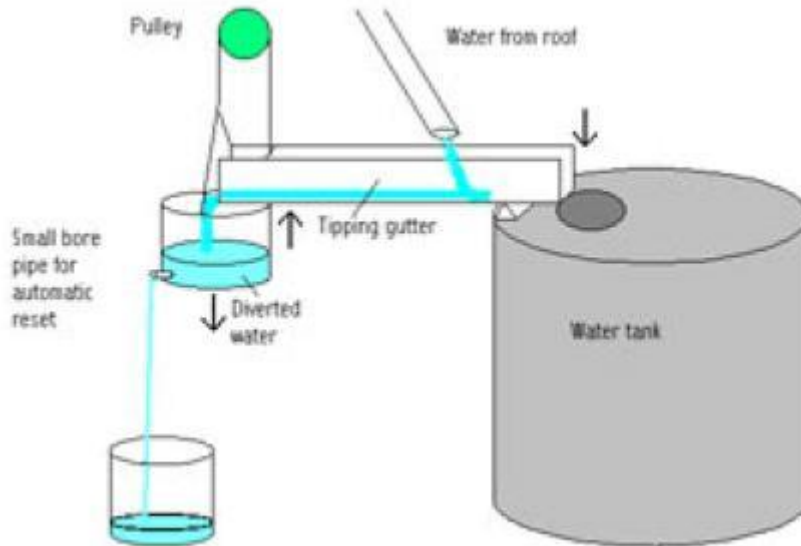
In a typical **rainwater harvesting system** rainwater is collected that lands on a roof and is then channelled down through guttering and pipe work to a storage tank. During dry periods of weather, the roof gets covered in a fine coating of dust together with leaves, bird droppings, and other debris. 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***

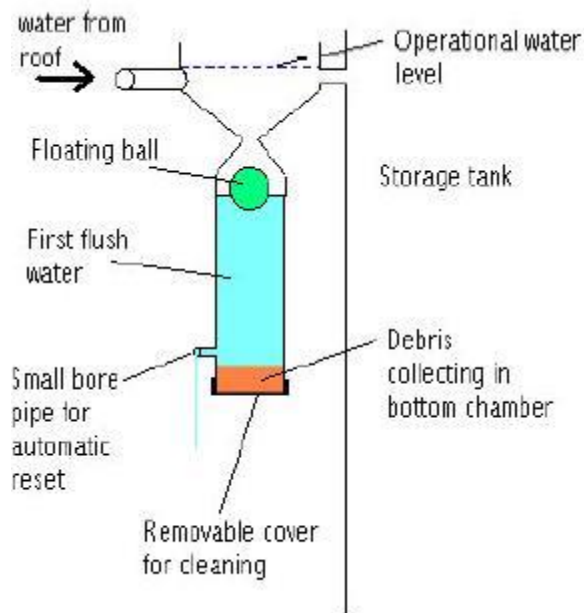


The **tipping gutter first flush system** (pictured above) is very simple to build, operate, and maintain. Water from the roof lands on a piece of guttering which is tipped down away from the water tank. Therefore, the first rains and their debris pour away from the tank and into a storage vessel. The 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.

## **ANNEX 5: Business model for household-level rainwater harvesting facilities**

This section proposes a viable business strategy for rainwater harvesting and mainstreaming of urban adaptation to ensure economic sustainability after project's life.

Scarcity of water for household consumption in both Nowshera and Rawalpindi cities is one of the major challenges the proposed project aims to address a contribution to building urban resilience in these two places. Review of relevant literature and direct interaction with target communities and concerned officials in both cities suggest the need for sustainable supply of clean water for drinking and other household purposes. So far, no sustainable solution has been worked out by concerned authorities in these cities as is the case in many other urban and rural settlements of Pakistan facing similar situation.

The project aims to promote such solutions/technologies that are socially and culturally acceptable and economically affordable for the poor households and communities. At the same time these solutions should be commercially profitable by the markets so after the project exhausts its designed life, the technologies are mainstreamed. Towards this end, the project builds upon the valid need of the target communities to fulfil their right to clean water as well as the potential of the target cities to harvest rainwater to complement the conventional mechanisms for supply of water to households. UNHABITAT's own experience as well as that of PCRWR, for instance, suggests that all the components of a household or community level rainwater harvesting setup are easily and affordably available in the local markets. Similarly, even a moderately trained plumber, with a simple orientation, can easily install this system.

Within this context and enabling environment, the project proposes following interventions as a viable business model for mainstreaming of rainwater harvesting in the target areas:

1. Assess the rainwater harvesting potential of the target areas using appropriate assessment techniques.
2. Assess the water consumption patterns of the target households and assess to what extent the harvested water can complement the routine water supplies to the households/communities.
3. Assess feasibility of appropriate rainwater harvesting technologies that contribute towards replenishing the groundwater aquifers.
4. Undertake a market research study to assess market acceptance and potential of rainwater harvesting to offer new opportunities for the local markets in shape demand for required products and creating new jobs.
5. Based upon these research inputs, design appropriate project strategies and monitoring and evaluation mechanisms.
6. Offer technical support to households and communities coupled with financial support to poor households to adopt the rainwater harvesting technologies.
7. Impart required skills to existing and new plumbers to install and maintain the rainwater harvesting technologies.





**Figure 1: A household level rainwater harvesting setup installed by UNHABITAT in the earthquake affected areas of Pakistan**

To understand the feasibility of rainwater harvesting facilities, following economic and technical studies, need to be considered.

### 1. How much can be harvested per m<sup>2</sup> of roof

According to a feasibility study undertaken for Pakistan Environment Protection Agency (Pak EPA) the volume of water from rain of 25 mm falling over an obstruction free roof of area 100 square meters is about 1600 litres or 16 litres per square meter. Khan (2005)<sup>53</sup> mentions that around 10 mm of rain equals to 10 litres of water per 100 m<sup>2</sup>.

### 2. Costs of water harvesting system

UNHABITAT Pakistan's technical team has prepared following table to calculate the cost involved in installing a rainwater harvesting system in a typical house in the target areas. The given prices are based upon prevalent market rates. Some of the given items are slightly overpriced in order to adjust the market fluctuations and price increases manufacturers are making due to rapid depreciation of Pak rupees against US\$. For instance, over last one year, Pak rupee has shed 50% of its value against US\$. Resultantly prices of items involving imported raw materials are consistently rising.

<sup>53</sup> Khan, A.R. (Jan 2005); Water Resource Development Potential; Dawn—International Edition; cited in Rainwater Harvesting Potential—A contribution to sustainable water management strategy; Hussain and Rehman, 2013



S#	Material	(Item Description)	Unit	Qty	Unit Rate PKR	Amount PKR
1	Providing and installation of 500 gallons plastic water storage tank of Master or equivalent	Master or equivalent, 2-years compressor warranty, compressor brand should be Panasonic and new, 1-year warranty for cooler services including necessary fitting and fixtures for operation as well as connection from existing water supply pipe	No	1	24,000	24,000
2	Providing and installation of 200 gallons plastic water storage tank of Master or equivalent	Master or equivalent, 2-years compressor warranty, compressor brand should be Panasonic and new, 1-year warranty for cooler services including necessary fitting and fixtures for operation as well as connection from existing water supply pipe	No	1	6,000	6,000
3	Supply & installation of 4" Dia UPVC pipes	Provision of 75 rft long good quality UPVC pipe 4" dia	rft	75	120	9,000
4	Supply and fixing of UPVC elbows of 4" dia	Good quality UPVC pipe 4" dia	No	4	250	1,000
5	Tee 4"x4"	Good quality UPVC pipe 4" dia	No	1	450	450
6	Solution	Fixing with elbows and pipe	No	4	250	1,000
7	Installation/ Labour	Plumber,	MD	4	1200	4,800
8	Labour charges	Helper	MD	4	800	3,200
<b>Grand Total</b>						49,450

### 3. Cost of water and use per household

The piped water supply in Pakistan is heavily subsidized. For instance, in Rawalpindi, in 2016, a house constructed on a plot size of 1900 square feet used to be billed PKR 320 as water charges. The community representatives in the target communities however told that, on average, a household had to spend around PKR 3000 for getting water. They took into account the cost of electricity required to suck water from the water pipelines (to overcome the low pressure); cost of fuel

households have to spend to haul potable drinking water, and payments made to water vendors and tankers. Somewhat similar views were expressed in Nowshera too.

According to the Utilities Directory 2012 published by Pakistan Water Operators Partnership (P-WOP); the average water consumption in Rawalpindi was 150 litres per capita. In case of Peshawar, a neighbouring city of Nowshera, this figure was 311.85 litres per capita.

#### 4. Calculated payback time

The study titled Rainwater Harvesting Potential—A contribution to sustainable water management strategy (2013) makes calculations for Lahore—the capital city of Punjab Province in these words, “Consider that  $2/3^{\text{rd}}$  (327 litres per capita  $\times 2/3=218$  litres per capita per day) of the daily water consumption is used for gardening, car washing, flushing, house cleaning, and laundry etc. then the harvested rainwater can be made available for the population (1,023, 510) of Lahore city under Lahore Development Authority is approximated as 96 days (appx.3.2 months)”. For the sake of convenience, if similar estimation is generalized for Rawalpindi and Nowshera, the harvested water can suffice for three months’ water consumption of a household. If PKR 3000 is taken as the cost of water a household actually have to pay for getting water, a household can save PKR 9,000 per annum. If PKR 50,000 is taken as the cost of rainwater harvesting system, the investment will return in about 5  $\frac{1}{2}$  years.

#### 5. Possibility to include water harvesting in building code

The Capital Development Authority (CDA)—the administrative body entrusted to look after the development of Islamabad, Capital of Pakistan and neighbouring city of Rawalpindi, has made it compulsory for house to be constructed on a plot size measuring 4500 square feet to have a rainwater harvesting system installed. The Rawalpindi Development Authority, while granting planning permission for development of housing schemes has been urging the developers to include Rainwater Harvesting in their respective building codes. For instance, Bahria Town Rawalpindi-Islamabad, in its building codes, urges the house owners to install rainwater harvesting system. The recently approved National Water Policy also provides for rainwater harvesting. The National Climate Change Policy also makes similar provisions.

In this context, there is a huge potential for project to advocate for effective implementation of these policy measures as well as introducing bye laws by municipal and urban development authorities across Pakistan to include rainwater harvesting in building codes.

#### 6. Possibilities for national programme

Rain water harvesting has been recommended in the recently approved National Water Policy 2018. Earlier it was made part of the National Climate Change Policy 2012. However, these policies do not hint at giving financial and fiscal incentives to households to adopt rainwater harvesting. Under such a scenario, the project can lobby for financial and fiscal incentives that could be offered by concerned authorities to households for promotion and adoption of rainwater harvesting. One possible measure could be relief in property tax and water user charges.