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LASOONA
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LOCAL ADAPTATION PLAN OF ACTION

UNION COUNCIL, DARI AZEEM KHAN AND BAGHO BAHAR

District Rahim Yar Khan

Changing Minds for Climate Resilience through Awareness Raising and Local Capacity Measures

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Noor Malik
Head of Programmes
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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CBO	Community Based Organization
CIMMYT	International Maize and Wheat Improvement Centre
CMIP6	Coupled Model Intercomparison Project Phase 6
COP	Conference Of the Parties
CRVA	Climate Risk and Vulnerability Assessment
DDMA	District Disaster Management Authority
DRR	Disaster Risk Reduction
ESM	Earth System Models
EWS	Early Warning System
GCM	General Circulation Models
GHG	Green House Gases
LAPA	Local Adaptation Plan of Action
MHM	Menstrual Hygiene Management
MIROC	Model For Interdisciplinary Research on Climate
NAP	National Action Plan
NCAP	National Local Adaptation Plan
NDC	Nationally Determined Contributions
NDMA	National Disaster Management Authority
NDMP	National Disaster Management Plan
NDRMF	National Disaster Risk Management Fund
NGO	Non-Government Organization
PARC	Pakistan Agriculture Research Council
PDMA	Provincial Disaster Management Authority
PMD	Pakistan Meteorological Department
PWD	Persons With Disabilities
SDGs	Sustainable Development Goals
SFDRR	Sendai Framework for Disaster Risk Reduction
TOT	Training of Trainers
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
WASH	Water, Sanitation, and Hygiene
WRI	World Resources Institute

SECTION 1: INTRODUCTION

1.1. Background and Purpose

Climate change stands as one of the foremost global challenges of our time, with profound repercussions felt across the world, affecting people, communities, and ecosystems[1]. Pakistan, due to its distinctive geographical positioning and climatic characteristics, finds itself acutely susceptible to the consequences of this phenomenon.

Within this global context, Rahim Yar Khan, a district in Southern Punjab, Pakistan, emerges as one of the areas most exposed to the adverse effects of climate change. This district is characterized by a semi-arid climate marked by hot temperatures and is affected by torrential rainfall, and flash and riverine floods. Already, Rahim Yar Khan contends with a spectrum of climate-related challenges, encompassing severe heatwaves, enduring droughts, and destructive storms, all of which resonate throughout the district, impacting its economy, environment, and the daily lives of its residents[2].

For instance, the region's escalating temperatures have led to a concerning surge in heat-related illnesses and fatalities. Prolonged droughts have resulted in crippling crop failures and a dire scarcity of water, significantly affecting agriculture and the livelihoods of its people2. The district has also grappled with the havoc wreaked by floods, disrupting infrastructure and daily routines, while destructive storms have left homes and businesses in ruins.

The overarching purpose of the Local Adaptation Plan of Action for Rahim Yar Khan is to bolster the district's resilience across critical sectors, including Agriculture, Public Health, Water, Sanitation, and Hygiene (WASH), and Disaster Risk Reduction (DRR). This plan is meticulously crafted to confront and adapt to the multifaceted impacts of climate change within these essential domains.

This adaptation plan is firmly committed to reducing the vulnerability of these sectors to climate change's impacts through the implementation of an array of strategies. It endeavors to enhance the district's adaptive capacity, enabling it to effectively respond to the ever-evolving challenges posed by climate change. Furthermore, the plan is dedicated to strengthening the overall resilience of the district in Agriculture, Public Health, WASH, and DRR.

To achieve these vital objectives, the plan outlines a comprehensive approach, encompassing the development of climate-resilient infrastructure, the promotion of climate-smart agricultural practices, enhancements in water resource management, the fortification of early warning systems, disaster preparedness measures, and widespread awareness-building regarding climate change. Additionally, it serves as a model for other regions in Pakistan, offering a replicable blueprint to address the urgent global challenge of climate change at the local level.

1.2. Climate Change Impacts in District Rahim Yar Khan

District Rahim Yar Khan faces a range of climate impacts, including rising temperatures, irregular rainfall patterns, and predictive data suggesting a future exacerbation of these challenges. These environmental shifts have profound effects on the district's agriculture, public health, water, sanitation, and hygiene, as well as disaster risk reduction efforts.

Agriculture: The district's agricultural cornerstone, central to its economy, grapples with the acute vulnerability resulting from climate change. Rising temperatures and erratic rainfall disrupt crop yields, imperiling food security, economic stability, and the livelihoods of the majority of the population[3]. The data reveals that Rahim Yar Khan has experienced a 1.5°C temperature increase since the 1960s. Furthermore, 2022 witnessed a severe heatwave with temperatures soaring up to 50°C, while erratic rainfall patterns have caused both severe droughts and record-breaking floods in 2020[4].

Public Health: Rising temperatures have led to a surge in heat-related illnesses, with vulnerable populations at heightened risk. Concurrently, shifts in precipitation patterns have driven the spread of waterborne diseases, disproportionately affecting children and the elderly. Recent data indicates that cases of heat-related illnesses have surged by 20%, according to the Rahim Yar Khan District Health Department5. Additionally, waterborne diseases have risen by 15%, with children under the age of five and the elderly being the most vulnerable[5].

Water, Sanitation, and Hygiene: Irregular rainfall patterns and frequent droughts create significant challenges in ensuring access to clean water, adequate sanitation facilities, and sound hygiene practices. These issues extend beyond public health, impeding economic and social development. Notably, only 65% of the district's population has access to clean water, as reported by the Rahim Yar Khan District Water and Sanitation Authority, and a mere 30% have access to adequate sanitation facilities[6].

Disaster Risk Reduction: The district faces recurring extreme weather events such as floods and storms, exacerbated by climate change. These events result in the loss of life, property damage, and community displacement. Data from the National Disaster Management Authority designates Rahim Yar Khan as a calamity-prone district due to its vulnerability to floods and storms. In 2022, a severe flood claimed over 100 lives, displaced more than 100,000 people, and inflicted significant damage to infrastructure and crops[7].

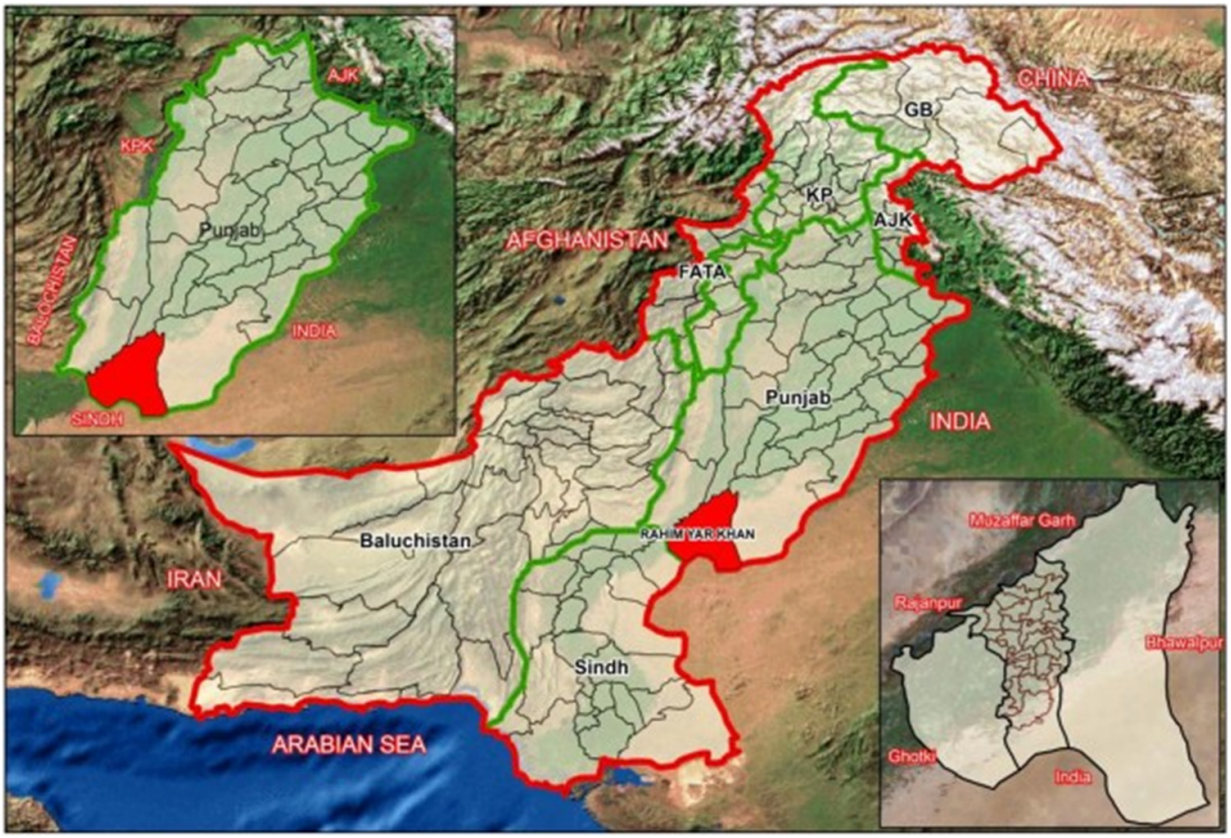


Figure 1: Location of District Rahim Yar Khan in Punjab Province

1.3. Objectives of the Plan

The primary goal of the 'Local Adaptation Plan of Action (LAPA)' is to enhance the district's resilience to climate change impacts, focusing on agriculture, public health, water, sanitation, hygiene, and disaster risk reduction. This goal is realized through three key objectives:

i. Minimize the district's vulnerability to climate change impacts, safeguarding critical sectors and livelihoods from disruptions caused by extreme weather events and shifting climate patterns.

ii. Empower the district to effectively respond and adapt to evolving climate challenges, ensuring flexibility and proactive responses in the face of uncertainty.

iii. Fortify the district's overall resilience to protect the economy, environment, and the well-being of its people, even in the wake of climate-induced stressors.

1.4. Target Beneficiaries

The LAPA promises substantial benefits to all stakeholders within the district. Residents will experience improved public health, and safety, and greater access to clean water and sanitation, enhancing their overall quality of life. Farmers and agricultural workers will see their livelihoods safeguarded and enhanced, while vulnerable populations, including children and the elderly, will be protected from climate-induced health risks.

Businesses and industries in the district will benefit from a more secure economic environment with fewer climate-related disruptions. Government entities will enjoy strengthened disaster risk reduction efforts and enhanced preparedness. Environmental ecosystems will also see greater sustainability and protection.

This comprehensive approach ensures a more resilient and adaptable district, delivering tangible advantages to its residents while serving as a model for other regions facing similar challenges. The plan stands as a strategy for enhancing well-being, prosperity, and sustainability in the district while safeguarding its natural environment and the interests of all stakeholders.

SECTION 2: CLIMATE RISK ASSESSMENT

2.1. Climate Change Projections

Climate change projections for Rahim Yar Khan were derived from the utilization of two Global Climate Models (GCM) and the CMIP6 scenarios. Both Bias correction and statistical downscaling of GCMs were applied to investigate the districts, following the approach outlined by Ahmad[8].

Historical climate analyses have revealed a temperature increase of 0.39°C between 1980 and 2010 in Rahim Yar Khan. Projections for the future suggest that the temperature is anticipated to rise by 1.9°C by the 2040s and further increase to 2.01°C by the 2070s in Rahim Yar Khan district. Notably, the results indicate that 2027 is projected to be a cooler year, with a mean annual temperature of 28.8°C, while 2028 is expected to be a warmer year, with the mean annual temperature reaching 31.5°C (Table/ Figure 1).

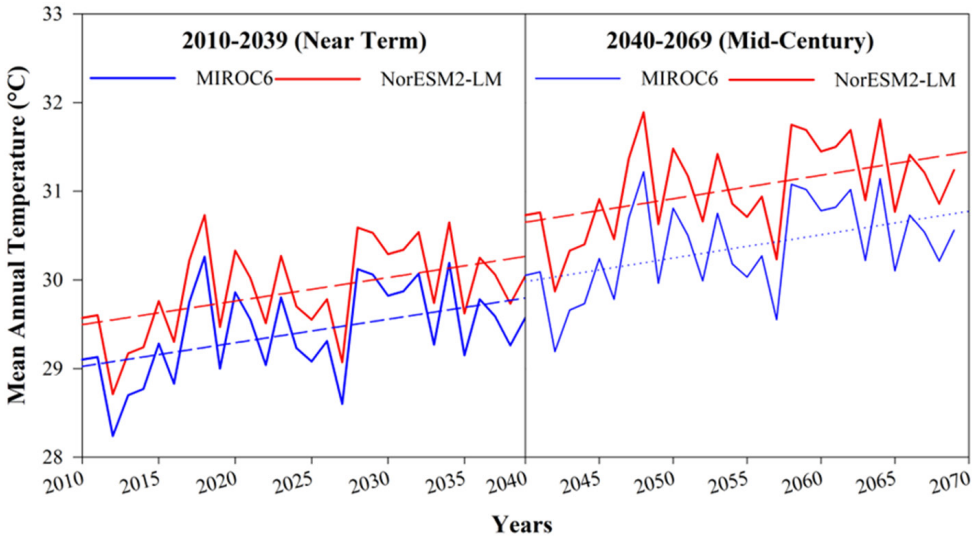
Table 1: Future rise in temperature in different scenarios

GCMs	MIROC6		NorESM2-LM	
Centuries	2010-39	2040-69	2010-39	2040-69
Mean Temp (°C)	29.4	30.36	29.87	31.03
Change (°C)	0.72	1.68	1.19	2.35

These findings are summarized in Table 1, which presents results for two distinct periods: 2010-2039 and 2040-2069. In the near term (2010-2039), MIROC6 predicts a mean temperature of 29.4°C, while NorESM2-LM projects a mean temperature of 29.87 degrees. As we progress towards the mid-century (2040-2069), the mean temperature is projected to rise, with MIROC6 indicating a temperature of 30.36 degrees and NorESM2-LM projecting a temperature of 31.03 degrees.

Furthermore, the data reveals a projected temperature increase of 0.72°C between 2010-2039 and 2040-2069 for MIROC6. In contrast, for NorESM2-LM, the temperature change is more substantial, with a projected increase of 1.68 degrees over the same period.

Figure 1: Climate Change Projections for Near-term and Mid-Century under RCP8.5 for Rahim Yar Khan



2.2. Climate-Induced Hazards at the District Level

Climate-induced hazards have emerged as a significant issue not only in the district of Rahim Yar Khan but on a national scale throughout Pakistan. In recent times, the growing frequency and severity of climate-induced hazards have underscored the immediate necessity to adapt to climate change, as they portend forthcoming challenges. These environmental threats carry substantial risks to the region's ecological balance, economic stability, and the welfare of its people. The respondents highlighted various significant hazards:

- Heavy rainfall: Erratic and Intense rainfall, even without river flooding, damages standing crops.

- Flash floods: previously unfamiliar, have become increasingly severe due to intense, short bursts of heavy rainfall that quickly inundate streets and agricultural lands. It was found in the targeted villages of Baghobahar Union Council that the community is more commonly affected by flash floods caused by heavy rain.

- Drought: Although intermittent, droughts now have more severe effects on certain crops and groundwater levels, resulting in increased salinity. Different fungus attacks are common during the drought conditions.

- Heatwaves: Heatwaves, now more common, pose health risks such as fainting and heatstroke. It also commonly affects women working in the agricultural field and the kitchen. Moreover, elderly people and persons with disabilities are found badly affected due to their low adopting capacities.

- Hailstorms: Hailstorms, often accompanied by severe windstorms and thunderstorms, have

become more frequent, negatively affecting standing crops and sometimes causing fires.

» Biological diseases in livestock: Biological diseases in livestock have become more common. The recent lumpy disease in the animal was one of the significant symptoms. It was also noticed that particularly during monsoon seasons and floods, mosquito attacks have become more common. People resort to lighting fires alongside livestock to create smoke and deter mosquitoes. Additionally, skin diseases in livestock have become more prevalent, further impacting livestock health.

2.3. Vulnerability Assessment

Regarding the populations most affected by climate change and increased disasters, the study has identified the following vulnerable groups:

» Women and adolescent girls: Cooking in hot, suffocating kitchens, they often faint due to excessive sweating.

» Children: Their outdoor play puts them at risk in hot weather.

» Elderly people: Their reduced tolerance for prolonged heat negatively affects their health.

» Persons with disabilities: Although a minority, those with disabilities are frequently affected by climate and weather changes.

» Labor force or daily wagers: The predominant composition of the labor force in the region consists of daily wage workers who toil outdoors, whether in agricultural fields or nearby markets. Their work environment often necessitates them to endure prolonged exposure to the relentless, scorching rays of the sun. Consequently, the high temperatures and the resulting excessive sweating have taken a significant toll on their health.

2.4. Coping Capacity Assessment

2.4.1. Capacities at the Organizational Level

During the key informant interviews conducted at various government offices, it became apparent that there is a growing emphasis on understanding and addressing environmental hazards and the impacts of climate change. The lack of emphasis on climate change as a pressing issue became evident when inquiring about existing adaptive measures. Very few concrete plans or strategies were available for sharing, indicating a significant gap in preparedness and response efforts. This lack of attention persisted until a recent and unprecedented event, such as heavy rainfall and flooding, prompted both government and non-government entities to acknowledge the stark reality of climate change.

Despite this recognition, the question of how to effectively adapt to climate change remains a substantial challenge at the organizational level. Many stakeholders within these institutions appear to lack the necessary awareness and tools for climate change mitigation and adaptation. This gap in capacity reflects a need for increased awareness, better planning, and enhanced resource allocation to address the impacts of climate change effectively.

2.4.2. Capacities at the Community Levels

It was found that communities are confronted with multiple challenges when it comes to building capacities to cope with climate change. Limited access to education and a lack of awareness among community members have resulted in minimal to no understanding of climate change and its potential effects on their means of livelihood, food security, and water resources. Despite witnessing alterations in weather patterns and an increase in hydro-meteorological hazards in recent years, they remain ill-equipped to respond to these challenges, primarily due to poverty and the dearth of awareness.

The adaptive capabilities of these communities are highly inadequate, as they lack the necessary knowledge, resources, and infrastructure to withstand the rigors of climate extremes. Local resources, though available, often suffer from dysfunction and require repairs or retrofitting to effectively deal with the impacts of climate change. Enhancing community-level capacities involves not only providing information and education but also addressing underlying socio-economic factors to ensure that vulnerable populations are better equipped to adapt to the changing climate and protect their well-being.

2.5. Climate Related Challenges

2.5.1. Agriculture Including Irrigation Water

District Rahim Yar Khan's economy relies heavily on agriculture, boasting successful yields of crops like wheat, cotton, and sugarcane, along with abundant mango and citrus fruit production. However, climate change presents significant challenges to this sector, notably in managing irrigation water. This local adaptation plan of action scrutinizes these climate-related agricultural issues with a focus on irrigation and water management. Below are the specific climate-related challenges and their impacts on agriculture:

a. **Erratic Rainfall Patterns:** The reverberations of climate change are evident in the increasingly unpredictable rainfall patterns that disrupt the well-organized scheduling of planting and harvesting activities for the region's hardworking farmers. For instance, between 1981 and 2010, Rahim Yar Khan experienced a 10% reduction in average annual rainfall and a 20% decrease in heavy rainfall days, significantly affecting crop planning[9].

b. **Rising Temperatures and Reduced Precipitation:** Climate change is causing temperatures to rise in Rahim Yar Khan, while precipitation is on the decline. This results in more frequent and severe droughts, which have a devastating impact on agriculture. For example, a 1°C temperature increase since 1981 has exacerbated frequent and severe droughts, such as the one in 2014-15 that led to extensive crop failures[10].

c. **Increased Evaporation:** Higher temperatures are also causing increased evaporation, further depleting the available water for irrigation. For instance, rising temperatures have led to a 15% increase in evaporation rates in Rahim Yar Khan since 1981, reducing the available water for irrigation[11].

d. **Water Scarcity:** The looming threat of water scarcity affects both surface and groundwater sources. Diminishing water tables and reduced river flow pose a substantial threat to the essential irrigation systems crucial for crop cultivation. For example, the district, with less than 1,000 cubic meters per capita annual water availability, heavily relies on declining groundwater due to over-extraction, which is dropping at a rate of 1 meter per year[12].

e. **Salinization:** Declining water levels in rivers and canals are leading to increased soil salinity, rendering the water unsuitable for irrigation, and affecting 20% of agricultural land[13].

f. **Waterlogging:** In some areas of Rahim Yar Khan, waterlogging has become a problem. This occurs when irrigation water seeps into the ground, raising the water table. Waterlogged soils are challenging to cultivate and can also damage crops. For example, irrigation water seepage has raised water tables, damaging crops and affecting 10% of agricultural land[14].

g. **Extreme Weather Events:** Climate change is also amplifying the frequency and severity of extreme weather events, such as floods and storms. These events can damage crops and irrigation infrastructure, further imperiling the stability of agricultural activities. For instance, climate change is intensifying floods and storms, as witnessed in 2012 when a flood caused significant damage to crops and irrigation infrastructure[15].

2.5.2. A Case Study of the Field Assessment

The Technical experts along with the support and facilitation of the LASOONA team conducted field assessments, consisting of both Focus Group Discussions (FGDs) and individual interviews, involving 42 farmers. The findings underscore several concerning aspects related to climate change in Rahim Yar Khan district.

Firstly, 87.5% of participants reported a significant increase in temperatures, a trend mirroring global climate change patterns. This temperature rise poses a substantial risk, particularly for an agriculture-dependent economy, as it can result in reduced crop yields and heightened water stress. The study also revealed changing precipitation patterns, acknowledged by 62.5% of participants (Table 2). In an area heavily reliant on agriculture, these fluctuations in rainfall disrupt planting and harvesting schedules, affecting crop quantity and quality.

Table 2: Climate change vulnerabilities and consequences in district Rahim Yar Khan

A: Assessment of CC & Variability					
Indicator/ Responses (%)	Strongly	Agree	Uncertain	Disagree	Strongly Disagree
Rising temperatures	12.5	87.5	-	-	-
Increasing annual precipitation	12.5	62.5	-	25	-
Escalating heavy/unseasonal rainfall events	25	37.5	37.5	-	-
Diminishing dry seasons	12.5	87.5	-	-	-
Surging heatwaves	-	100	-	-	-
Rising frequency of storms and cyclones	-	62.5	37.5	-	-
B: Consequences of climate Change					
Temperature's impact on crop yields	12.5	87.5	-	-	-
Changing precipitation and crops	25	62.5	12.5	-	-
Rising pests and diseases in agriculture	25	75		-	-
Climate change: waterlogging & salinity	12.5	62.5	12.5	12.5	-
Soil fertility decline due to climate change	12.5	87.5	-	-	-

Rising temperatures negatively affect crop yields, according to 87.5% of participants, threatening reduced productivity and income loss for farmers. Additionally, the prevalence of pests and diseases

in agriculture, as voiced by 75% of participants, is on the rise, potentially jeopardizing crop health and yields.

Waterlogging and salinity issues, mentioned by 62.5% of participants, complicate the efficient use of water, posing risks to both farmers and the local economy. Lastly, deteriorating soil fertility due to climate change, cited by 87.5% of participants, threatens agricultural sustainability. Groundwater pollution adds another layer of complexity to the region's agricultural challenges.

2.5.3. Water, Sanitation and Hygiene

Availability and Quality of Drinking Water

Both health officials and community members reported a decline in the availability and deterioration in the quality of drinking water as a result of climate change. Groundwater levels have decreased during the summer season, resulting in reduced access to clean drinking water. This compromised availability and quality of water increase the risk of waterborne diseases. For example, the mixing of contaminated water with sewage during heavy rainfall can lead to the spread of diseases such as cholera, hepatitis A and B, and skin irritations.

Sanitation Facilities

Inadequate infrastructure and low sanitation awareness contribute to unsanitary conditions, particularly during extreme weather events. The community primarily relies on pit latrines connected to sewage systems for sanitation. However, heavy rainfall causes the mixing of rainwater with sewage, leading to the spread of diseases. Moreover, poor sanitation practices, including inadequate handwashing, further exacerbate the risk of disease transmission. Diseases such as diarrhea, cholera, and hepatitis A were reported which are linked to inadequate sanitation facilities and practices.

Waste Management

Inadequate waste management practices were identified as a significant issue in both the interviews with health officials and the community members. Improper disposal of household waste and garbage, combined with heavy rainfall, results in unhygienic conditions. The mixing of garbage with water during floods spreads foul odors and increases the risk of diseases. Diseases such as gastrointestinal infections, skin infections, and respiratory illnesses were reported and are associated with poor waste management practices.

Hygiene Practices

Climate change affects the community's hygiene practices, as reported by both health officials and community members. Extreme weather conditions, such as hot summers and cold winters, pose challenges in maintaining cleanliness and practicing proper hygiene. Moreover, a lack of awareness about hygiene practices, including handwashing, further increases the risk of disease transmission. Diseases such as diarrhea, respiratory infections, and skin infections were reported which are linked to poor hygiene practices.

Infrastructure Damage

Extreme weather events, including floods and heavy rainfall, caused significant damage to infrastructure including roads, schools, and health facilities. This Infrastructure damage disrupts healthcare services and limits access to clean water and sanitation facilities. As a result, the risk of waterborne diseases such as cholera, hepatitis A and B, and skin irritations increases due to compromised access to clean water and sanitation.

Menstrual Hygiene Management

Climate change has also impacted menstrual hygiene management in the study area. During extreme weather events like floods and droughts, there is a decline in clean water availability and quality, making it difficult for women and girls to access clean water for menstrual hygiene. Inadequate sanitation facilities, low awareness, and contamination during extreme weather further compromise MHM practices. As a result, women and girls are at risk of infections, including urinary tract infections and reproductive tract infections.

2.5.4. Health

Changes in Average Temperature

The majority of respondents reported a noticeable increase in summer temperatures and a longer duration of the summer season. They also mentioned a decrease in winter temperatures but with an increase in intensity. These changes have had significant health implications for the community. During heatwaves, individuals are at a higher risk of experiencing heat-related illnesses such as heat exhaustion and heatstroke. Extreme heat also exacerbates existing health conditions and leads to dehydration, fatigue, and respiratory problems. Similarly, the colder winters have been associated with an increased incidence of respiratory issues, including cold-related illnesses such as the common cold, flu, and bronchitis.

Changes in Rainfall Patterns

The community members reported changes in rainfall patterns over the past few years. Summer rainfall was observed to have increased but in an irregular pattern. This irregularity in summer rainfall has resulted in sudden and heavy downpours, leading to flash floods and waterlogging. These events pose significant health risks, including an increase in the spread of waterborne diseases such as Cholera, Hepatitis A and B. On the other hand, winter rainfall was reported to have decreased, affecting water availability for agriculture and domestic use. This reduction in winter rainfall leads to water scarcity, impacting hygiene practices and increasing the risk of waterborne diseases.

Increase in Waterborne Diseases

Climate change has been linked to an increase in waterborne diseases due to challenges in sanitation and safe drinking water. Respondents mentioned diseases such as cholera, Hepatitis A and B, and skin irritation as being specifically associated with climate change. The irregular rainfall patterns and flooding can contaminate water sources, which provide a breeding ground for waterborne pathogens,

increasing the risk of these diseases, and leading to the spread of waterborne diseases. Inadequate sanitation facilities and poor hygiene practices further contribute to the transmission of these diseases. Health officials reported an increase in the number of reported cases of waterborne diseases over the past 2-3 years, indicating the growing impact of climate change on public health.

Impact on Infrastructure and Health Services

Extreme weather events, such as heavy rainfall and heatwaves, have had a significant impact on infrastructure and health services. Flooding caused by heavy rainfall has damaged roads, making transportation difficult and hindering access to healthcare facilities. Schools have also been affected, with closures due to flood-related damage. During heatwaves, the availability and accessibility of health services, including vaccinations and routine check-ups, have been disrupted. Lady health workers, responsible for providing healthcare services in rural areas, have faced challenges in reaching villages due to extreme weather conditions.

Vulnerability of Certain Groups

The study identified certain groups within the community as more vulnerable to the health impacts of climate change. Elderly people, persons with disabilities, younger children, and those involved in agriculture activities were reported to be particularly affected. Elderly people may have reduced physiological resilience to extreme temperatures, making them more susceptible to heat-related illnesses. Young children, whose immune systems are still developing, may be more vulnerable to waterborne diseases. Those involved in agriculture activities may face increased exposure to extreme weather conditions, leading to a higher risk of health issues associated with climate change.

SECTION 3: PROPOSED ADAPTATION MEASURES

3.1. Introduction

Following an extensive research endeavor that involved conducting key informant interviews across various administrative tiers and engaging in in-depth Focus Group Discussions (FGDs) within the selected communities of Rahim Yar Khan District, a comprehensive suite of climate adaptation strategies has been unveiled. These strategies encompass a wide spectrum of initiatives, all united by the overarching goal of bolstering resilience across multiple sectors. These sectors include agriculture, water resource management, water, sanitation, hygiene, and healthcare. Furthermore, a prominent focus has been placed on the implementation of robust disaster risk reduction measures to effectively counteract the adverse impacts of severe weather events.

3.2. Proposed Measures for Climate Change Adaptation and Disaster Risk Reduction

Table 3: Suggested Structural and Non-Structural Adaptation Measures

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Me-dium Term	Long Term
	3.2.1.Proposed Measures for DRR and CCA Sector					
I	Lack of awareness and ability to combat climate change and adapt to its impacts.	Conduct a series of climate change awareness raising sessions	Local govt, DDMA, CBOs and NGOs		X	X
II		» Coordinate training sessions for government departments and local communities on climate change adaptation and disaster risk reduction. » Additionally, conduct Training of Trainers courses to cultivate skilled trainers who can then disseminate training and raise awareness at the grassroots level.	DDMA, Local govt, UN, I/NGOs	X		

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Me-dium Term	Long Term
III	Poorly maintained and inadequate drainage channels often become obstructed, causing difficulties in effectively draining heavy rainfall or floodwaters.	Improving drainage and sewerage system			X	
IV		Floodwater management mobilize community members to regularly clear debris from local streams and nullahs to prevent flooding.	DDMA, Civil Defence, PRCS, Social Welfare, NGOs, and UNs		X	X
V	A prevalent lack of motivation and knowledge hinders the initiation of local initiatives. Moreover, a predominantly reactive approach persists in address-ing disasters at the village level.	Establish climate-resilient committees both at district and local levels inside the communities	Tehsil admin, DDMA, Civil Defence, PRCS, Social Welfare, NGOs and UNs	X		
VI		Develop emergency response plans for floods and heavy rainfall, including evacuation routes and shelters.	Tehsil admin, DDMA, Civil Defence, PRCS, Social Welfare, NGOs and UNOs	X		
VII	Insufficient un-derstanding of the connection between climate change and the occurrence of di-sasters. The teachers and students need to be aware of the consequences and adaptation measures	School Infrastructure Improvement Allocate funds for retrofitting and repairing schools to make them more resilient to heavy rainfall and flooding. Install solar panels to ensure a continuous power supply, especially during power cuts.	Education, DDMA, I/ NGOs and CSOs			X

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
VIII	The indiscriminate felling of trees continues unabated due to the ongoing construction of houses and infrastructure development.	Afforestation on hilly terrain: Reforestation initiatives, by growing climate resilient plants that suit the local environment	Forest, DDMA, IUCN, I/ NGOs and UNOs		X	X
IX	The spread of biological diseases is not limited to humans but also affects livestock, particularly during the monsoon and flooding seasons, when such occurrences are more prevalent.	Mosquito control and spray during the monsoon seasons	District and Tehsil Admin, DDMA	X	X	X
	3.2.2. Proposed Measures for the Health Sector					
I	Decline in clean water availability and quality during extreme weather events	Construct rainwater harvesting systems	Local government NGOs		X	
II	Groundwater depletion during summer seasons	Install hand pumps or tube wells	Local government NGOs	X		
III	Deterioration in the quality of drinking water, leading to increased risk of waterborne diseases	Promote water conservation practices	Local government NGOs			X
IV	Mixing of contaminated water with sewage during heavy rainfall	Implement water treatment and purification methods	Local government NGOs		X	

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Me-dium Term	Long Term
V	Mixing of rainwater with sewage during heavy rainfall	Construct and maintain improved sanitation facilities	Local gov-ernment NGOs	X		
VI	Inadequate hand-washing practices	Promote the construction of handwashing stations	Local gov-ernment NGOs		X	
VII	Lack of awareness about hygiene practices, including handwashing	Conduct hygiene education and awareness programs	Local gov-ernment NGOs			X
VIII	Improper waste disposal practices	Establish community-based waste management systems	Local gov-ernment NGOs	X		
IX	Improper waste management practices	Promote composting and recycling practices	Local gov-ernment NGOs			X
X	Lack of access to proper sanitation facilities and poor handwashing prac-tices	Improve access to handwashing facilities	Local gov-ernment NGOs	X		
XI	Lack of awareness about hygiene practices, including handwashing	Conduct hygiene promotion campaigns	Local gov-ernment NGOs		X	
XII	Decline in clean water availability and quality, making it difficult for women and girls to access clean water for menstrual hygiene	Provide access to affordable and culturally acceptable menstrual hygiene products	Local gov-ernment NGOs	X		

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
XIII	Inadequate sanitation facilities, low awareness, and contamination during extreme weather compromise MHM practices	Conduct MHM education and awareness programs	Local government NGOs			X
	3.2.3. Proposed Measures for WASH Sector					
I	Irregular and intense summer temperatures increase the demand for shaded areas	Improve access to shaded areas in public spaces	Local Government/ Municipal Corporation	X		
II	Limited awareness about the health risks associated with extreme heat	Raise awareness about heat-related illnesses and preventive measures	District Health Department	X		
III	Socioeconomic factors may limit access to appropriate clothing and hats for sun protection, especially among vulnerable groups	Encourage the use of light-colored clothing and hats for sun protection	District Health Department	X		
IV	Limited resources and infrastructure challenges in rural areas may impede efforts to improve insulation in homes and public buildings	Improve insulation in homes and public buildings	Local Government/ Municipal Corporation		X	

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Me-dium Term	Long Term
V	Lack of access to proper clothing and heating facilities during colder winters exacerbates the risk of respiratory illnesses, particularly among vulnerable populations	Educate communities on the importance of proper clothing and heating practices during cold weather	District Health Department	X		
VI	Irregular rainfall patterns and decreased winter rainfall contribute to water scarcity, making it challenging to ensure consistent access to clean drinking water sources	Improve access to clean drinking water sources	District Water and Sanitation Department		X	
VII	Inadequate sanita-tion infrastructure and poor hygiene practices increase the risk of water con-tamination, requir-ing comprehensive water treatment methods to ensure safe drinking water	Promote water treatment methods	District Water and Sanitation Department	X		

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
VIII	Flooding and waterlogging due to irregular rainfall patterns can damage sanitation infrastructure, hindering efforts to promote proper waste management practices and increasing the risk of waterborne diseases	Enhance sanitation infrastructure and promote proper waste management practices	Local Government/ Municipal Corporation		X	
IX	Limited access to education and awareness programs in rural areas may hinder efforts to promote proper hygiene practices, exacerbating the spread of waterborne diseases	Conduct hygiene education programs	District Health Department	X		
X	Damage to infrastructure during extreme weather events disrupts healthcare services, making it challenging to provide adequate medical care to affected communities	Strengthen healthcare infrastructure and facilities	District Health Department			X

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
XI	Limited resources and capacity to develop and implement emergency response plans may compromise the ability of healthcare facilities to effectively respond to extreme weather events	Develop emergency response plans for healthcare facilities	District Health Department		X	
XII	Lack of training and resources for healthcare workers may impede their ability to effectively respond to emergencies during extreme weather events, compromising patient care	Train healthcare workers on emergency preparedness and response	District Health Department	X		
XIII	Extreme weather conditions, such as heavy rainfall and flooding, may hinder the mobility of healthcare units	Establish mobile healthcare units to reach remote areas during extreme weather events	District Health Department			X
XIV	Identifying and reaching vulnerable groups, such as the elderly and young children, may pose logistical challenges in rural areas with limited access to healthcare services	Develop targeted healthcare programs for vulnerable groups	District Health Department		X	

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
XV	Limited access to education and awareness programs in rural areas may hinder efforts to conduct effective health education campaigns, particularly among vulnerable populations	Conduct health education campaigns	District Health Department	X		
XVI	Socioeconomic factors and geographical barriers may impede the establishment of community-based support networks, limiting their effectiveness in reaching and assisting vulnerable populations	Establish community-based support networks for vulnerable populations	District Social Welfare Department		X	
	3.2.4. Proposed Measures for the Agriculture Sector					
I	Limited access to reliable climate information services.	Establish a local weather forecasting system or access to reliable climate information services.	Private NGCOs, Universities	x		
II	Need for drought-resistant crop varieties.	Research and promote drought-resistant crop varieties suitable for the area.	Agriculture Department Punjab (Research)			x
III	Declining groundwater levels and water availability for agriculture.	Revive and promote traditional water harvesting techniques like "Khadins" and "Johads" for groundwater recharge.	Irrigation Department		x	
IV	Lack of tree cover and windbreaks.	Integrate agroforestry practices by planting trees on farm boundaries or unused areas.	Forest Department			x

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
V	Vulnerability of crops to pests and diseases.	Promote the use of indigenous crop varieties adapted to local conditions.	Agriculture Department (Extension)		x	
VI	Lack of heat-tolerant livestock breeds.	Research and introduce heat-tolerant livestock breeds.	Livestock Department			x
VII	Dependence on agriculture as the primary livelihood.	Diversify livelihood options through beekeeping, poultry farming, and small-scale dairy farming.	Livestock Department		x	
VIII	High soil salinity affects crop productivity.	Implement measures to reduce soil salinity, such as leaching and gypsum application.	Soil Salinity Department	x		
IX	Poor soil fertility and moisture retention capacity.	Promote practices like composting, green manuring, and agroforestry for soil fertility improvement.	Agriculture Department Punjab		x	
X	Limited knowledge and adoption of climate-resilient agricultural practices.	Conduct training programs and awareness campaigns on climate-resilient agriculture.	Department of Extension	x		
XI	Lack of policies supporting climate-smart agriculture.	Advocate for policies supporting climate-resilient agriculture.	P&D Department		x	
XII	Market dependence on a single crop or market leads to vulnerability to market fluctuations and climate risks.	Support farmers in diversifying their markets and value chains.	Agriculture Department Punjab	x		
XIII	Inadequate training and extension services on climate-smart agricultural practices.	Provide training and extension services on climate-smart agricultural practices.	Department of Extension	x		

S #	Challenge	Solutions	Stake holders	Implementation Phase		
				Short Term	Medium Term	Long Term
XIV	Identifying and reaching vulnerable groups, such as the elderly and young children, may pose logistical challenges in rural areas with limited access to healthcare services	Develop targeted healthcare programs for vulnerable groups	District Health Department		X	
XV	Limited access to education and awareness programs in rural areas may hinder efforts to conduct effective health education campaigns, particularly among vulnerable populations	Conduct health education campaigns	District Health Department	X		
XVI	Socioeconomic factors and geographical barriers may impede the establishment of community-based support networks, limiting their effectiveness in reaching and assisting vulnerable populations	Establish community-based support networks for vulnerable populations	District Social Welfare Department		X	

SECTION 4: IMPLEMENTATION MECHANISM FOR THE ADAPTATION PLAN

4.1. Introduction

In the development of the implementation structure for the Local Adaptation Plan, it is essential to establish a governance framework, define timeframes for short-, medium-, and long-term projects/ programs, and engage committed partners to mobilize resources for executing the action plan. Recognizing these immediate requirements, the action plan will present a comprehensive framework to identify and coordinate various stakeholders over the next decade. This will be achieved through a holistic strategy aimed at creating "Climate and Disaster Resilient Communities.

4.2. Implementation Mechanism

The aforementioned implementation framework will be put into action through the establishment of a dedicated committee known as the "Climate Adaptation Steering Committee". The proposed structure is as follows:

- Chair: Deputy Commissioner
- Secretary: Department of Environment
- Members: District Heads of Agriculture, Irrigation, Social Welfare, Forest, Civil Defense, Health, Education, C&W, DDMA, and representatives from NGOs operating in District Rahim Yar Khan.

The committee's role and responsibilities will encompass providing policy guidance for implementation, resource mobilization, sustain capacity building initiatives to enhance the skills and knowledge of local government officials, community leaders, and technical experts involved in climate resilience projects approval of programs/projects, and the task of reviewing and updating the adaptation plan as required when circumstances necessitate changes.

4.3. Coordination Mechanism, including Partnership and Collaboration

- The committee will establish robust coordination through the scheduling of regular meetings and the exchange of information among committee members, as well as with pertinent departments and other relevant stakeholders.
- Members of the committee will convene a meeting every six months to review progress and establish milestones for the next phase.
- By implementing a coordinated information-sharing system, the aim is to strengthen the

capabilities of the involved stakeholders, key departments, and other relevant partners.

» The committee will ensure to kickstart of collaborative disaster and climate resilience programs/projects to address shared interests involving both government and non-government stakeholders, as well as the broader community.

4.4. Resource Mobilizations

To enhance administrative capabilities in building disaster and climate resilience, it is imperative to establish a robust financial strategy to address unexpected events and facilitate the mobilization of resources as needed. Consequently, the committee will take steps to involve non-governmental organizations, the United Nations, donors including the National Disaster Risk Management Fund (NDRMF), Asian Development Bank (ADB), and World Bank, etc., philanthropists, and local political leaders in investing in and supporting the implementation of the local adaptation plan.

Additionally, the committee will place a high priority on fostering cooperation and advocating for public-private partnerships, aiming to involve financial institutions in actively participating in the plan's implementation.

4.5. Monitoring and Evaluation Mechanism

To ensure the effective implementation of the District Rahim Yar Khan Adaptation Plan in Punjab, a robust Monitoring and Evaluation (M&E) process is essential. This M&E process provides a structured framework for assessing the plan's progress, effectiveness, and impact in the district. By following a systematic series of steps, we can gauge how well the adaptation strategies are meeting their objectives and make informed decisions for adjustments and improvements.

i. Data Collection and Baseline Assessment In this initial phase, a dedicated M&E team will be assembled to carry out data collection and establish a baseline assessment for the adaptation plan in District Rahim Yar Khan. This includes the collection of essential baseline data, customized to the district's specific needs. Key indicators such as crop yields, soil salinity levels, water usage, and livestock survival rates will be measured, and specific, measurable indicators aligned with the plan's targets will be defined.

ii. Regular Progress Monitoring: After setting the baseline, a systematic data collection and reporting system will be implemented. Regular intervals, such as annual or biannual assessments, will be conducted to monitor the ongoing progress of the adaptation plan. Data accuracy will be maintained through periodic verification checks and cross-referencing with multiple sources, where applicable. Continuous monitoring is crucial for keeping track of the plan's performance in District Rahim Yar Khan.

iii. Stakeholder Engagement and Feedback: Engagement with local communities and

stakeholders is at the heart of this M&E process, especially in the context of District Rahim Yar Khan. Stakeholders will be actively involved and encouraged to provide feedback and share their observations based on their local experiences and knowledge. This two-way engagement ensures that the M&E process remains inclusive and responsive to the specific needs and concerns of the district's residents, guiding decisions, and adjustments accordingly.

iv. Adaptive Management and Review: As the adaptation plan unfolds in District Rahim Yar Khan, periodic reviews and policy adjustments will be essential. Data collected and stakeholder feedback will be crucial in making informed decisions. External evaluations will be periodically commissioned to provide an independent assessment of the plan's progress and impacts. These evaluations ensure that the adaptation plan remains dynamic and responsive to changing conditions within the district.

v. Accountability and Transparency: Accountability and transparency are paramount in District Rahim Yar Khan's adaptation process. Responsible organizations and agencies will be held accountable for the outcomes of the adaptation plan. Detailed records of data, findings, and evaluation reports will be maintained and made accessible to the public, stakeholders, and government agencies. Public awareness and education efforts will inform the community about the adaptation plan's objectives, progress, and benefits. Lessons learned from the M&E process will be shared to inform future climate adaptation initiatives in the district, fostering a culture of continuous improvement and knowledge sharing.

SECTION 5: LIST OF ANNEXURES

Annexure 1: Data Collection and Analysis Methodology

Data Collection

The sampling methodology utilized in this study was a combination of purposive and convenience sampling. Purposive sampling was employed to select Key Informants from government officials, while convenience sampling was used to select participants for FGDs from the local communities.

Data collection involved a multi-step process. Firstly, each of the three experts conducted a desk review to gather relevant information and familiarize themselves with the existing literature on climate change impacts and adaptation strategies in District Rahim Yar Khan. This step helped in developing a comprehensive understanding of the research context.

After the desk review, the experts proceeded to the field, accompanied by a field supervisor from the Lasoona team. The field supervisor played a crucial role in introducing the experts to the stakeholders who had already been identified by the LASOONA team. This ensured that the experts had access to a diverse range of stakeholders, including government officials and local community members.

In total, all experts conducted 12 interviews, including 04 KIIs and 08 IDIs with government officials and 16 FGDs with local communities. The table below provides a distribution of interviews conducted by three experts. The KIIs and IDIs provided valuable insights into the policy and decision-making processes related to climate change adaptation in District Rahim Yar Khan. On the other hand, the FGDs allowed for a deeper understanding of the perspectives and experiences of the local communities regarding climate change impacts and adaptation measures.

Expert	Type of Interview			No. of Interview(s)
	KII	IDI	FGD (Males & Females)	
Agriculture Expert	1	2	8	11
DRR Expert	2	2	4	8
Health & WASH Expert	1	4	4	9
Totals	4	8	16	28

Data Analysis

The data analysis process involved several steps to ensure rigor and reliability. Thematic grid analysis was employed as the primary method for analyzing the collected data. This approach involved the identification of key themes and patterns within the data, which were then organized into a thematic grid for further analysis. To enhance the validity and reliability of the findings, triangulation was employed. Triangulation involves the use of multiple data sources, methods, and researchers to cross-validate the findings. In this study, triangulation was achieved by combining data from Desk Review,

KIIs, IDIs, and FGDs, as well as involving multiple experts in the data collection process.

During the data analysis phase, the experts carefully reviewed and coded the transcribed interviews and FGDs. They identified recurring themes, patterns, and emerging concepts related to climate change impacts, vulnerabilities, coping capacities, and adaptation strategies in the district. The thematic grid served as a framework for organizing and analyzing the data, ensuring a systematic and comprehensive analysis.

Overall, the sampling and data analysis methodologies utilized in this study aimed to capture a diverse range of perspectives and experiences related to climate change adaptation in Rahim Yar Khan. The combination of purposive and convenience sampling, along with thematic grid analysis and triangulation, helped to provide a comprehensive and robust analysis of the collected data.

Annexure 2: Glossary of Terms Used in the Plan

- **Adaptation:** the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to the expected climate and its effects.

- **Adaptation to Climate Change:** Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected Climate Change effects is known as adaptation to climate change. Crucial to reducing vulnerability to Climate Change, understanding how individuals, groups, and natural systems can prepare for and respond to changes in climate is known as adaptation.

- **Biodiversity:** Variety of plant and animal life in the world or a habitat or ecosystem.

- **Climate:** the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. The classic period for averaging these variables is 20 to 30 years. The relevant quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

- **Climate Change:** A change in the state of the climate that can be identified (for example, using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or land use.

- **Climate Change Adaptation:** Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial

opportunities is known as Climate Change Adaptation.

» **Climate Change Impacts:** The effect of climate change on natural and human systems is known as climate change impacts. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts.

» **Climate Change Mitigation:** Strategies and policies that reduce the concentration of greenhouse gases in the atmosphere either by reducing their emissions or by increasing their capture are known as climate change mitigation.

» **Disaster:** severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery. See UNISDR Global Assessment Report on Disaster Risk Reduction 2015.

» **Disaster Risk Reduction:** Disaster risk reduction is aimed at preventing new and reducing existing disaster risks and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.

» **Drought:** a period of abnormally dry weather long enough to cause a serious hydrological imbalance.

» **Early Warning System:** the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities, and organizations threatened by a hazard to prepare to act promptly and appropriately to reduce the possibility of harm or loss.

» **Exposure:** The situation of people, infrastructure, housing, production capacities, and other tangible human assets located in hazard-prone areas.

» **Global Warming:** the gradual increase, observed or projected, in global surface temperature, as one of the consequences of radiative forcing caused by anthropogenic emissions.

» **Greenhouse Gases (GHGs):** Natural and industrial gases that trap heat from the earth and warm the surface. The Kyoto Protocol restricts emissions of six greenhouse gases: natural (carbon dioxide, nitrous oxide, and methane) and industrial (perfluorocarbons, hydrofluorocarbons, and sculpture hexafluoride).

» **Greenhouse Effect:** The insulating effect of certain gases in the atmosphere, which allows solar radiation to warm the earth and then prevent some of the heat from escaping.

» **Resilience:** the capacity of social, economic, and environmental systems to cope with a hazardous event trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation,

learning, and transformation.

» **Risk Assessment:** A qualitative or quantitative approach to determine the nature and extent of disaster risk by analyzing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people, property, services, livelihoods, and the environment on which they depend.

» **Sustainable Livelihood:** livelihood that endures over time and is resilient to the impacts of various types of shocks including climatic and economic.

» **Vulnerability:** The conditions that are determined by physical, social, economic, and environmental factors or processes that increase the susceptibility of an individual, a community, assets, or systems to the impacts of hazards.

» **Weather:** The state of the atmosphere about temperature, cloudiness, rainfall, wind, and other meteorological conditions. It is not the same as climate, which is the average weather over a much longer period.

Annexure 3: Global and National Strategies for Climate Change and Disaster Risk Reduction

Introduction

In this section, there will be a detailed discussion of different policies, strategies, frameworks, and plans developed by the concerned Government Department and the United Nations on Disaster Risk Reduction and Climate Change Mitigation and Adaptation.

International Strategies and Framework on Climate Change and Disaster Risk Reduction

Kyoto Protocol

The Kyoto Protocol, which is a part of the United Nations Framework Convention on Climate Change (UNFCCC), was officially adopted during the third session of the conference of the parties to the UNFCCC in 1997 in Kyoto Japan. It encompasses legally binding commitments that go beyond the obligations outlined in the UNFCCC. Specifically, nations within the Organization for Economic Cooperation and Development, along with countries undergoing economic transitions, agreed to make substantial reductions in their human-caused emissions of greenhouse gases, including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The target was to achieve a minimum 5% reduction below 1990 emission levels during the commitment period spanning from 2008 to 2012[16].

Paris Agreement - Conference of the Parties

Adopted during the twenty-first session of the Conference of the Parties (COP) in December 2015, the Paris Agreement stands at the forefront of international climate policy. Its primary objective is to constrain the rise in global average temperatures, endeavoring to keep it well below a 2°C increase

from pre-industrial levels and striving to limit it to a more ambitious 1.5°C, acknowledging that this would substantially mitigate the threats and repercussions of climate change. Furthermore, the agreement's signatory parties also reached a consensus on a worldwide adaptation goal, aiming to enhance the capacity to adapt, bolster resilience, and reduce susceptibility to climate change, all while contributing to sustainable development and ensuring robust adaptation measures in line with the aforementioned temperature target. Within the framework of the Paris Agreement, each country commits to and communicates their determined, ambitious efforts as Nationally Determined Contributions (NDCs) to collectively address the challenges of climate change and fulfill the agreement's overarching objectives[17].

Sustainable Development Goals

The Sustainable Development Goals (SDGs) were endorsed on September 27, 2015, and officially came into effect on January 1, 2016. The SDGs represent a wide-reaching consensus involving various stakeholders, encompassing countries as well as non-state actors such as the private sector and non-governmental organizations, with the shared aim of attaining sustainable and inclusive economic growth, fostering peaceful, equitable, and inclusive societies, safeguarding the environment, ensuring access to clean water, promoting sustainable patterns of production and consumption, taking decisive action against climate change, and fortifying global partnerships for sustainable development. These SDGs consist of 17 distinct objectives, each accompanied by a series of related targets and a comprehensive set of quantifiable indicators utilized to monitor advancement; collectively, there are 169 targets and 230 endorsed indicators spanning the entire spectrum of the SDGs. Notably, among the 17 SDGs, Goal 13 is specifically dedicated to the urgent addressing of climate change and its consequences[18].

Sendai Framework for Disaster Risk Reduction

The United Nations General Assembly officially approved the Sendai Framework after the third United Nations World Conference on Disaster Risk Reduction, which took place in Sendai, Japan, in March 2015. The essence of the Sendai Framework represents a significant shift from the mere management of disasters to a comprehensive approach that centers on the management of existing and future risks, with the primary objective of achieving resilience-building as a central milestone by 2030. By encapsulating climate-related disasters and broader resilience-building, the Sendai Framework mirrors the broader scope of the disaster risk reduction community. Its goal-oriented framework aligns closely with the Sustainable Development Goals (SDGs), offering the flexibility to establish tailored indicators specific to each country's unique circumstances, thus promoting greater harmony with other pertinent policy priorities like adaptation. Within the Sendai Framework for Disaster Risk Reduction (SFDRR), seven global targets and four priority actions have been established to be achieved by 2030[19].

National Policies and Strategies on Climate Change and Disaster Risk Reduction

National Disaster Risk Reduction Policy

Following the enactment of the National Disaster Management Act in 2010, the Government of Pakistan crafted the "National Disaster Risk Reduction Policy" in 2013. This policy serves as a comprehensive guiding framework for managing disaster risks throughout the country. It has been developed through

a thorough examination of assessments, pertinent frameworks, policies, and plans. The national disaster risk reduction policy offers a comprehensive assessment and discussion of both natural and human-induced hazards. It outlines strategies for managing risks and reducing vulnerability to these hazards. Additionally, the policy encompasses measures geared toward fostering resilience, risk awareness, and sustainable development practices. These measures are essential for minimizing the impacts of both natural and human-made disasters. Moreover, the policy delineates decentralized responsibilities for the implementation of disaster risk reduction measures, extending from the provincial level down to the district and sub-district levels[20].

National Disaster Management Plan

To put the national disaster risk reduction policy into effect across the country, a ten-year National Disaster Management Plan (NDMP) was formulated, spanning from 2012 to 2022. This plan delineates the roles and responsibilities of various stakeholders, including the federal government, provincial authorities, district, and local governments, as well as non-governmental entities such as community organizations, civil societies, and business enterprises. Consequently, it assumes a pivotal administrative role in safeguarding both lives and livelihoods against the onslaught of disasters. Furthermore, the NDMP outlines a comprehensive approach to managing the entire spectrum of disasters. It achieves this by formulating policies, strategies, measures, and concrete actions involving all stakeholders and by bolstering institutional capabilities, as well as human and material resources for activities related to disaster mitigation, prevention, preparedness, response, and recovery. Though, the NDMP was outdated last year, however, it is still intact as the NDMA is in the process of developing a revised NDMP that shall be available for wide circulation[21].

National and Provincial Climate Change Policies

Pakistan's National Climate Change Policy of 2021 represents a crucial step in the country's commitment to address the pressing issue of climate change. This comprehensive policy framework aims to mitigate the adverse effects of climate change while fostering sustainable development. It focuses on reducing greenhouse gas emissions, enhancing resilience to climate impacts, and promoting green and clean energy sources. The policy emphasizes the importance of international cooperation and partnerships to tackle global climate challenges. Furthermore, it underscores the need for climate adaptation measures, including water resource management, afforestation, and climate-smart agriculture, to safeguard Pakistan's vulnerable ecosystems and communities from climate-related risks. Overall, Pakistan's 2021 National Climate Change Policy signals the nation's dedication to combating climate change while pursuing sustainable socio-economic growth.

National Adaptation Plan

To fully implement the National Climate Change Policy, the Ministry of Climate Change approved the National Adaptation Plan in 2023 which stands as a visionary blueprint for a climate-resilient and prosperous future. It symbolizes a call to action, urging all stakeholders to unite and forge a path of transformation in the face of climate adversity. By prioritizing adaptation and implementing the NAP's strategies, Pakistan can not only mitigate the growing risks but also seize the limited but real opportunities for sustainable economic growth and social inclusivity. It presents a unique and pivotal opportunity for the nation to take the lead, becoming a beacon of inspiration for the rest of the world in the critical battle against climate change. The 2023 plan outlines a comprehensive approach to

adaptation across various sectors, such as agriculture, water resources, infrastructure, and health, while Disaster risk reduction is a cross-cutting issue embedded in all sectors7.

Alignment of the Plan with the Existing Policies and Strategies

Considering the policies and plans developed at both the global and national levels, the Government of Pakistan is unwavering in its commitment as a signatory to international agreements and frameworks related to climate change and disaster risk reduction. This commitment at the local level is also essential to remain aligned with global and national goals. Pakistan's position as one of the top ten countries most severely impacted by climate change, as per the Global Climate Risk Index 2019, underscores the urgency of these commitments. Recent years have witnessed significant alterations that have heightened the scale, frequency, and unpredictability of climate-induced disasters, disproportionately affecting the livelihoods and infrastructure of people residing in hazard-prone regions. To effectively address these pressing issues, it becomes imperative to grasp the intricate relationship between climate change and disaster risk reduction.

Furthermore, aligning local adaptation plans with international and national commitments not only bolsters Pakistan's credibility and commitment on the global stage but also maximizes resource efficiency. This approach integrates climate change adaptation efforts by drawing lessons from the experiences of other countries, attracting donors to invest in DRR and climate change adaptation. Furthermore, it also eliminates the duplication of efforts and optimizes the allocation of funds and resources. Such alignment ensures that investments made in various sectors effectively contribute to building resilience and mitigating climate-related risks.

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LASOONA
Relief and Development Organization

The “Changing Minds for Climate Resilience through Awareness Raising and Local Capacity Measures” is a transformative initiative spanning selected districts of Khyber Pakhtunkhwa and South Punjab. Focused on empowering vulnerable communities—particularly women, people with disabilities, youth, and children—the project seeks to enhance climate awareness, build adaptive capacities, and equip farmers with sustainable practices.Through knowledge dissemination and community engagement, we aim to forge a resilient front against climate change, fostering a united commitment for a sustainable future.

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