EUROPEAN UNION

STAKEHOLDER RECOMMENDATIONS FOR CLIMATE CHANGE IMPLEMENTATION FRAMEWORK, AJK

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EXECUTIVE SUMMARY

Pakistan is a textbook case of a country that contributes little to global GHG emissions, but faces atypical impacts. Pakistan accounts for only 0.8% of total global emissions[1], while the impacts of climate change have cost the country in terms of lives and the economy: Climate induced disasters between 1994 and 2013 resulted in an average economic loss of US$ 3.99 billion per annum. Between 2010-2014, flood events alone have led to losses of over US$ 18 billion, with 38.12 million people affected, 3.45 million houses damaged and 10.63 million acres of crops destroyed. Similarly the unprecedented heat wave in Karachi in 2015 resulted in the deaths of over 1200 people[2].

At the same time, Pakistan's emissions show a trend of increase, as its investments in economic growth bear fruit. Over the past 2 decades, the emissions grew 123%[3]. In a recent statement, Pakistan's minister for climate change stated that given the projected economic growth trajectory, emissions in Pakistan were expected to increase from 405 metric tons carbon dioxide to more than 1,603 metric tons of CO2 in the next 15 years - that means increasing by almost four times[4].

As Pakistan faces the dual pronged challenge of adapting to climate change while managing its carbon footprint, the government has upped its approach through a number of international, national and provincial measures to tackle the climate challenge. As well as being signatory to the Paris Climate Change Agreement 2015, Pakistan submitted a 'Nationally Determined Contribution' in 2015 to the UNFCCC secretariat, that commits a reduction in its carbon emissions by 20% by 2030, subject to financial support[5].

At the national level, the National Climate Change Policy (2012), its associated Implementation Framework (2014-2030), the Pakistan Climate Change Bill (2016) set out Pakistan's direction in tackling the climate challenge. At the same time, the provinces are steadily taking up the reins in through the development of policies and strategies to address the localized impacts of climate change.

In recognition of the increasingly important role played by the provinces in action on climate change at the local level, the Civil Society Coalition for Climate Change[6] in collaboration with the Ministry of Climate Change and P and D Department, AJK, conducted a consultative workshop for developing recommendations for an institutional framework for achieving the objectives of climate change policies and frameworks at the provincial level. The workshop, titled 'Framing the Agenda for Climate Change: Consultative Dialogue, AJK' was conducted in Muzzafarabad, at PC Hotel, on the 19th of October 2017.

The event featured robust participation from government, civil society, academia and the media. Following welcome remarks by Aisha Khan, C.E, Civil Society Coalition for Climate Change, the opening address was delivered by Syed Abu Ahmad Akif, Federal Secretary, Ministry of Climate Change, with special remarks by Dr. Tariq Banuri, ED GCISC, and Dr. Asif Hussain, P and D Department, Government of AJK. The keynote address was delivered by Dr. Muhammad Najeeb Naqi, Minister for Finance, Health and P and D, AJK.

[1]Pakistan Nationally Determined Contribution to the UNFCCC, 2015
[2]ibid
[3]Pakistan National Environment and Economic Development Study (NEEDS), Ministry of Environment, 2010-2011
[4]http://www.theecologist.org/News/news_analysis/2989149/pakistan_to_quadruple_carbon_emissions_despite_feeling_pain_of_climate_change.html
[5]http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Pakistan/1/Pak-INDC.pdf
[6]CSCCC is a licensed coalition (registered under Section 42 of the Companies Ordinance, 1984) dedicated to highlighting the subject of climate change in Pakistan and promoting informed climate action at the regional, national and subnational levels through research, knowledge-sharing, and advocacy.

The workshop was designed to strengthen capacity for planning, budgeting, implementation and monitoring of climate policies with timelines and benchmarks. The primary objective of the workshop was to improve civil society's capacity to work constructively with public authorities', building trust for partnership opportunities, and creating space for civil society to participate in policy dialogues that lead to inclusive, accountable and transparent approaches for effective governance that meet people's needs and boost free flow of information at the local and national level.

The workshop followed a whole of government approach and brought stakeholders from government, civil society, media and academia together to identify threats and opportunities and make recommendations on the way forward for developing an effective national response to climate action. This report presents a background of climate issues in AJK, and documents the recommendations put forward by participants at the consultative dialogue on developing a Provincial Climate Change Implementation Framework in line with the National Climate Change Policy.

LIST OF ACRONYMS

ADB	Asian Development Bank
AEDB	Alternate Energy Development Board
ADBP	Agricultural Development Bank of Pakistan
AJK	Azad Jammu & Kashmir
AR	Annual Report
CADD	Capital Administration & Dev. Division
CBOs	Community Based Organizations
CC	Climate Change
CCI	Council of Common Interests
CDA	Capital Development Authority
CDG	City District Government
CETPs	Combined Effluent Treatment Plants
CO2	Carbon Dioxide
CSCCC	Civil Society Coalition for Climate Change
CSD	Conference on Sustainable Development
CSR	Corporate Social Responsibility
DDMAs	District Disaster Management Authorities
DMC	Domestic Material Consumption
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
EU	European Union
FAO	Food and Agriculture Organization
FATA	Federally Administered Tribal Areas
FC	Forman Christian
FDI	Foreign Direct Investment
FFC	Federal Flood Commission
Fig.	Figure
FI	Financial Institution
FPCCI	Federation of Pakistan Chambers of Commerce & Industry
GB	Gilgit Baltistan
GCISC	Global Change Impact Studies Centre
GDP	Gross Domestic Product
GHGs	Greenhouse gases
GHI	Global Hunger Index
GIS	Geographical Information System
GJ	Giga Joule
GLOF	Glacial Lake Outburst Floods
GoKP	Government of Khyber Pakhtunkhwa
GOP	Government of Pakistan
GPS	Global Positioning System
HDIP	Hydro Carbon Development Institute of Pakistan
HEC	Higher Education Commission
HPP	Hydropower potential
HTV	Heavy Transport Vehicle
ICM	Integrated Coastal Management
ICTs	Information and Communication Technologies
IEE	Initial Environmental Examination
IPCC	Inter-provincial Coordination Committee

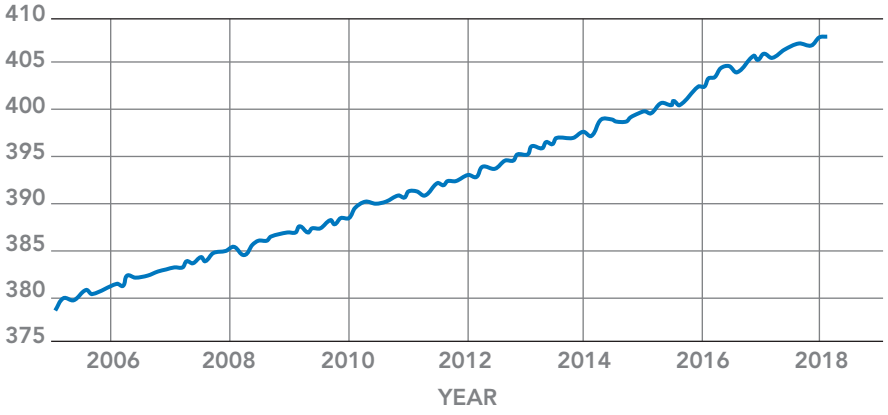
IPM	Integrated Pest Management
IRSA	Indus River System Authority
IUCN	International Union for Conservation of Nature and Natural Resources
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
Kg	Kilogram
kl	kilo liters (1000 liters)
Km	Kilo-meter
KPK	Khyber Pakhtunkhwa
LG	Local Governments
LGRDD	Local Government, Elections and Rural Development Department
LPG	Liquefied Petroleum Gas
LTV	Light Transport Vehicle M/o Ministry of
MAF	Million Acre Foot
MDGs	Millennium Development Goals
MF	Material Footprint
MOCC	Ministry of Climate Change
MPCD	Marine Pollution Control Department
MRV	Measuring, Reporting, and Verification
MW	Mega Watt
NAP	National Action Plan
NARC	National Agricultural Research Council
NCCF	National Climate Change Fund
NCCP	National Climate Change Policy
NCPC	National Cleaner Production Center
NCS	National Conservation Strategy
NDMA	National Disaster Management Authority
NEECA	National Energy Efficiency and Conservation Authority
NEPRA	National Electric Power Regulatory Authority
NEQS	National Environmental Quality Standards
NGOs	Non-Governmental Organizations
NHA	National Highways Authority
NIE	National Implementing Entity
NIO	National Institute of Oceanography
NSDS	National Sustainable Development Strategy
OGP	Open Government Partnership
OECD	Organization for Economic Co-operation and Development
OGRA	Oil and Gas Regulatory Authority
PAEC	Pakistan Atomic Energy Commission
P&D	Planning and Development
Pak EPA	Pakistan Environmental Protection Agency
Pak-INDC	Pakistan's Intended Nationally Determined Contribution
PARC	Pakistan Agricultural Research Council
PC	Planning Commission
PCRET	Pakistan Council of Renewable Energy Technologies
PCRWR	Pakistan Council of Research in Water Resources
PCSIR	Pakistan Council of Scientific and Industrial Research
PDMAs	Provincial Disaster Management Authorities
PITB	Punjab Information Technology Board
PMD/MET	Pakistan Meteorological Department
PPP	Public Private Partnership
PPPA	Public Private Partnership Authority
PPRA	Public Procurement Regulatory Authority
Prov.	Province, including AJK, GB & FATA
PRSP	Poverty Reduction Strategy Paper

PSDP	Public Sector Development Program
PSLM	Pakistan Social and Living Standards Measurement
PSQCA	Pakistan Standards & Quality Control Authority
PTA	Pakistan Telecommunication Authority
R&D	Research and Development
REDD+	Reduction of Emissions from Deforestation and Forest degradation
Rs.	Rupees
SCP	Sustainable Consumption and Production
SCDA	Sindh Coastal Development Authority
SDGs	Sustainable Development Goals
SEA	Strategic Environment Assessment
SERRA	State Earthquake Rehabilitation and Reconstruction Authority, AJK
SLM	Sustainable Land Management
SMEDA	Small and Medium Enterprise Development Authority
SMEs	Small and Medium Enterprises
SUPARCO	Space and Upper Atmosphere Research Commission
UN	United Nations
UNCSD	United Nation Conference on Sustainable Development
UN Environment	United Nations Environment Programme
UNESCO	United Nation Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WAPDA	Water and Power Development Authority
WASA	Water and Sanitation Authority
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund
ZTBL	Zarai Taraqiati Bank Limited

INTRODUCTION

Global research going back to 1824 in fields ranging through physics, oceanography, biology and geology have confirmed that human activity—mainly burning fossil fuels, raising livestock and destroying carbon sinks like forests and wetlands—is increasing greenhouse gas emissions and causing global temperatures to rise rapidly, putting humanity at risk. Every legitimate scientific academy and institution agrees that time is running out and urgent action is needed to keep temperature increase below 2 degrees Celsius.

However despite scientific evidence there is a disconnect between the reality of climate change and the priority given to it by the governments around the world in taking measures that are critical for keeping PPM rate below 3%. The Atmospheric CO2 is rising at an unprecedented rate. The consequences of this rapid increase are profound for earth's temperatures, climates, ecosystems and species, both on land and in the oceans.



Source: climate.nasa.gov

There is need for recognition from all stakeholders that overexploitation of natural resources and following unsustainable pathways to development that irrevocably disturb the balance between nature and human activity will put the planet at risk. While we need economic development there is an equal and urgent need to protect the environment, and to remember that the two are not equal considerations. The current economic model can be changed but the finite resources of the planet cannot be enhanced to meet the needs of a human population that has more than quadrupled to seven billion and rising in little more than a century. All studies are unanimous in their conclusion that we must refrain from burning fossil fuel to avoid catastrophic warming.

Pakistan is among several countries whose carbon footprint is a fraction of global GHG emissions, but where the magnitude of climate induced stress has created disproportionate vulnerability on ground. As far as numbers go, Pakistan accounts for a mere 0.8% of total global emissions[1] even as its carbon footprint has grown by 123 per cent over the last two decades[2] against an average industrial growth rate of 5.33 per cent per annum between 1990-2017[3].

Pakistan's industrial base and population have considerably expanded between 1990 and 2018, and correspondingly, the target increase of greenhouse gas emissions can be traced to the energy sector which accounts for 46 per cent of the national carbon count, followed by agriculture with 41 per cent and thereafter other sectors[4]. Power generation for Pakistan's ever increasing energy consumption needs and expanding transportation are expected to further drive up energy-based emissions. Meanwhile, there is a high dependency on agriculture for employing roughly half the national workforce, providing food security and bolstering GDP and export revenues.

[1]Pakistan Nationally Determined Contribution to the UNFCCC, 2015
[2]Pakistan National Environment and Economic Development Study (NEEDS), Ministry of Environment, 2010-2011
[3]https://tradingeconomics.com/pakistan/industrial-production
[4]USAID (2016) Greenhouse Gas Emissions in Pakistan available at https://www.climatelinks.org/sites/default/files/asset/document/GHG%20Emissions%20Fact%20Sheet%20Pakistan_6-3-2016_edited_rev%2008-18-2016.pdf

Even greater is Pakistan's reliance on the Indus river system to feed agriculture, other industrial usages and domestic consumption. Between 2010-2014, repeated mega flooding across the Indus River cost a staggering US$ 18 billion in damages, affecting 38.12 million people, destroying 3.45 million houses and 10.63 million acres of crop. Climate related losses averaged US$ 3.99 billion each year between 1994 and 2013 (citation needed), rolling back what modest economic gains were made during the 1990s.

The stresses of climate change are all too evident in Pakistan and the region at large. Accelerated melting of glaciers, erratic monsoons, frequency of extreme weather events such as flash floods and heat waves have a massive cumulative impact on Pakistan's poor climate resilience and governance mechanisms. In 2015, Pakistan requisitioned US$ 40 billion abatement cost in mitigation and 7- 14 million USD to meet adaptation needs as part of it its Nationally Determined Contribution, projecting an increase from 405 metric tons carbon dioxide to more than 1,603 metric tons of CO2 in the next 15 years[5].

[5]http://www.theecologist.org/News/news_analysis/2989149/pakistan_to_quadruple_carbon_emissions_despite_feeling_pain_of_climate_change.html

PREPARATORY STEPS

Recognizing the crucial mandate available to provinces to implement climate action, the Civil Society Coalition for Climate Change (CSCCC)[6] collaborated with the Ministry of Climate Change (MoCC) and Planning and Development Department AJK to conduct a consultative workshop to formulate policy recommendations that help construct an institutional framework for achieving the objectives of climate change policies at the state level.

The inception dialogue was conducted at two levels to develop a broad based constituency of support for the workshop objectives. The CSCCC delegation called on the President of AJ&K to apprise him about the purpose of organizing the workshop and the expected outcome of the session. A meeting was also held at the Department of Planning and Development AJ&K with participation from relevant line departments to share proposed agenda and receive input from department representatives. CSCCC followed a 'Whole of Government Approach' to build consensus on objectives, identify thematic areas and share program methodology. Focal persons from both sides were nominated and roles and responsibilities were distributed with mutual consent to streamline activities.

In order to develop a framework that feeds into existing policies and also reflects AJK specific short and long term concerns, CSCCC used the AJ&K Climate Change Policy as the building block, and aligned it with the National Climate Change Policy to construct sector specific templates for developing a sub-national framework of activities that dovetail with the national policy and framework. A template for Monitoring, Reporting and Verification Framework was also developed to help with measuring progress on indicators. The templates were shared with AJ&K government for review and comments before circulation to all the participants ahead of the workshop date to help them make a more meaningful contribution to the process (templates in annexure).The workshop format was designed for co creation of policy and engaged all key stakeholders from public sector and civil society to make consensus based recommendations on sector specific thematic areas.

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STATE PROFILE OF AZAD JAMMU &KASHMIR

Azad Jammu and Kashmir (AJ&K) is a self-governing state administered under the federation of Pakistan. With a total landmass of 13,297 sq. km, the State is divided into 10 districts within the larger divisions of Mirpur, Poonch and the capital Muzaffarabad. The population of AJK as per the 2017 census is 4,045,366, with an 88:12 rural-urban ratio. 49.7% of the population is female, with an overall literacy rate of 74%, which is significantly higher than Pakistan.

The state of Azad Jammu and Kashmir (AJ&K) is characterized by a mountainous terrain susceptible to high climate variability. The topography differs between the southern districts which are partially hilly including Kotli, while Bhimber and Mirpur are plains. The central and northern areas of the state are mainly hilly and mountainous with valleys and stretches of plain. In these areas, the climate is moist with average rainfall exceeding 1400 mm per year.

The southern districts of AJ&K including Bhimber, Mirpur and Kotli have hot weather in the summer, and moderate cold weather in the winter, classified as a warm to hot sub-tropical continental monsoon type. AJ&K has been divided into eight agroclimatic zones i.e. (i) Glaciers and cold caps; (ii) Very cold temperate continental winter rains; (iii) Cold dry temperate continental winter rains; (iv) Very cold temperate continental winter rains and monsoon; (v) Cold temperate continental winter rains and monsoon; (vi) Moist warm temperate continental winter rains and monsoon; (vii) Humid warm sub-tropical continental winter rains and monsoon; and (viii) Sub-humid hot sub-tropical continental winter rains and monsoon.

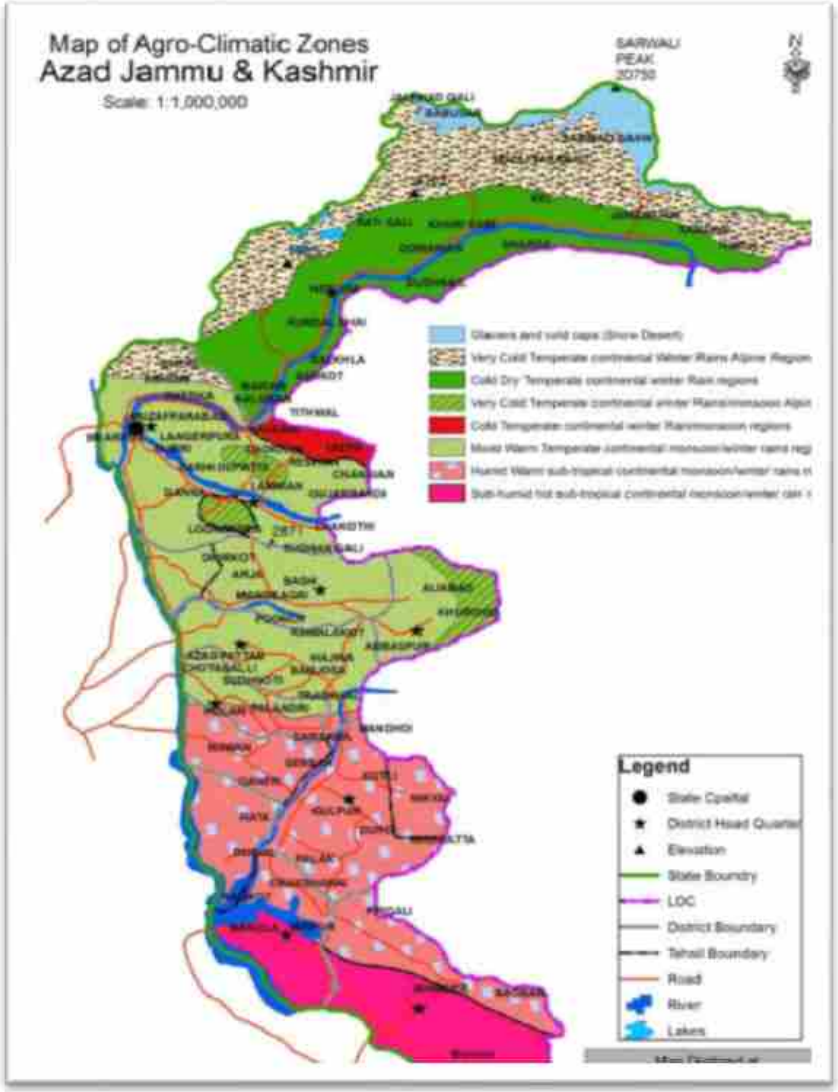
The major rivers flowing through AJ&K including Jhelum, Neelum and Poonch are part of the trans-boundary Indus rivers system distribution between India and Pakistan. The state has 239 glaciers spread over a total

DIVISION	DISTRICT	AREA (km^2)	POPULATION (2017 Census)
Mirpur	Mirpur	1010	456,200
	Kotli	1862	774,194
	Bhimber	1516	420,624
Muzaffarabad	Muzaffarabad	1642	650,370
	Jhelum Valley	854	230,529
	Neelum	3621	191,251
Poonch	Poonch	855	500,571
	Haveli	600	152,124
	Bagh	768	371,919
	Sudhanoti	569	297,584
Total	10	13297	4,045,366

area of 92.229 km2, with 76 glacial lakes mostly concentrated in the largest northern district by landmass, Neelum.

As most of the rural population of AJK depends on agriculture, forestry and livestock for subsistence, 13% of the total state land or 166,432 hectares is under cultivation. 92% of the cultivable area is rain fed, with major crops including maize, wheat and rice. 42.6% of the land area is controlled by the forest department. AJ&K has 11.6% of its area under thick forest cover where varieties of Deodar, Kail, Blue Pine, Silver Fir and Chir Pine grow. 16.9% area consists of thinly wooded forests.

Current and future climate projections made by the Pakistan Meteorological Department (PMD) give evidence of rapid climate change occurring in AJ&K. Temperature and rainfall records over the last fifty years (1960-2007) in the region show rising climate trends in the province with average maximum temperature increasing to 0.82 degrees and precipitation to 75mm. This has resulted in a number of extreme weather events such as flash floods and delays in normal rainfall patterns. Furthermore, the PMD data also shows that the region is experiencing longer hot days and increased heat waves in the summer season and decreased cold waves in the winter. The analyses presented by PMD show that region is getting one extra month of summer every year, similar to the rest of Pakistan since 1980. The impact of temperature and precipitation increase has adversely impacted the glaciers and biodiversity in the region, which can have negative effects on the ecosystem in the province.
Current climate data and future projections suggest that climate in AJ&K is changing at an unprecedented rate. In the absence of effective climate mitigation and adaption action plan, AJ&K's water resources, food security, forests' biodiversity and subsequently human security and livelihoods already threated with further deteriorate as the impacts of climate change increase at an exponential rate.



IMPACT OF CLIMATE CHANGE IN AJ&K

Climate degradation is likely to bring about wide ranging political-economic, social and governance related challenges. The foremost sectors demonstrating this change are as given below.

Environment, Water resources, and Forestry

Natural ecosystems in AJ&K are being harmed through increased variation in temperature and precipitation. The decline in environmental quality and depletion of natural resources result in social and economic difficulty for those depending on these ecosystems for subsistence and food security.

Freshwater resources are largely replenished by monsoon rains, snow, and glacial melt, which are highly sensitive to climate change, much like forest and rangeland ecosystems, that provide valuable ecosystem services such as protecting soil conditions, buffering floods, fuel sources, and sequestering carbon. Climate change threatens to alter the species' composition and population of forests and rangelands through shifting temperature and rainfall patterns.

Agriculture and Livestock

Agriculture and livestock are key economic sectors, with about 13 percent of the state under rain-fed cultivation. Changes in temperature and precipitation have affected the agriculture systems, somewhat displacing the sowing and harvesting seasons, and decreasing the productivity of soil and cropping patterns. Livestock in the region is threatened with an increase the incidence of vector borne diseases.

Trade and Industry

A robust, diversified, and climate resilient industry sector is vital for AJ&K to attain low carbon climate resilient development. Trade and industry are closely linked with other key sectors such as agriculture and natural resources to provide products and services to businesses and industries. Locally induced or larger climate degradation will likely disrupt the traditional economy and AJ&K's trade strengths.

Physical Infrastructure

Climate change has been a threat multiplier in mountainous AJ&K, where physical infrastructure is vital for survival. Damage to roads networks, homes, water and sanitation services, as well as access to civil services is completely interrupted in the extreme weather events. This becomes a constant worry for policy planners to create and maintain public infrastructure, faced with increasing climate degradation.

Energy

Energy production and utilization has close linkages with climate change. Biomass energy obtained from burning wood and dung continue to be the traditional method for domestic usage in rural AJ&K. This creates harvesting pressure on forests and rangelands, thereby increasing deforestation rates and natural hazards. Hydroelectricity is not generated at scale; reduction in reservoir levels can decrease hydroelectricity generation, leading to greater reliance on burning fossil fuels and wood for domestic and minor industrial purpose.

Tourism

Tourism can be a major revenue generating sector for AJK, directly connected with the natural environment. Climate variability as well as anthropogenic activity is affecting the natural resources in the state, which in turn, hamper this revenue generating exercise.

Health

There is increased risk from climate-sensitive infectious illnesses, including waterborne disease like diarrhea, hepatitis A and typhoid fever. Extreme temperatures have also increased the incidence of vector borne diseases such as malaria and dengue that are usually atypical for high altitude locations such as AJK.

NATIONAL AND STATE POLICIES GOVERNING CLIMATE CHANGE

The Government of Pakistan ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1994 and the subsequent landmark Paris Agreement in 2016. It annually participates in the Conference of the Parties (COP) to the UNFCCC to present its interests and position in international climate talks. The federating units of Pakistan and the State of AJ&K are obliged to implement nationally ratified conventions and treaties.

Furthermore, the federal government introduced its National Climate Change Policy in 2012 that established an overarching framework for climate action in the country. The Policy turned into an Act of parliament in 2016, and contains an implementation framework for government agencies to respond to climate related challenges. Moreover, the Act encourages provincial governments to initiate their own policy frameworks on climate change taking local contexts, capacities and vulnerabilities into consideration.

Climate change is a development issue in AJK. A coherent and coordinated regulatory framework is required to guide any effort in combating climate change and building the resilience of communities against climate impact. At present, the Planning and Development Department (Government of AJK), in collaboration with relevant line agencies, is spearheading efforts to develop operational and organizational structures to implement climate change strategies. The department is also working towards developing sectoral laws, policies, and institutional mandates that explain the roles and functions required for climate change response.

In this respect, the AJ&K Government has engaged with a number of stakeholders to develop its own Climate Change Policy and Implementation Framework. Through establishing the Climate Change Center within the Planning and Development Department, it aims to create state level adaptation and mitigation strategies, design mechanisms for their implementation, communication, awareness, capacity building, research and development. It is also tasked to improve climate governance in the state through mobilizing resources from local and national budgets, and international means to implement climate related projects. The AJ&K Climate Change Policy prioritizes specific areas for mitigation and adaptation including water resources, forestry, agriculture and livestock, energy and Disaster Risk Reduction.

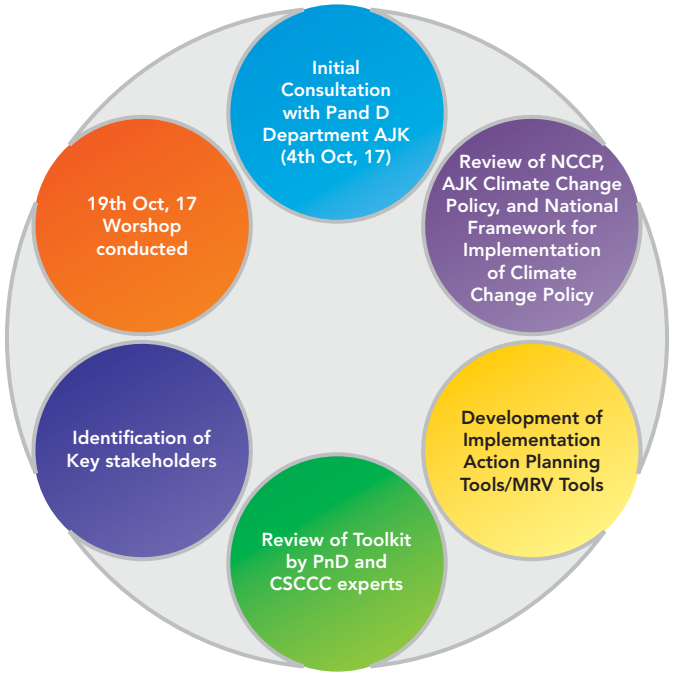
One of the overarching goals of the AJ&K government is to implement the Sustainable Development Goals, including climate change and disasters. The region has witnessed several natural hazards and extreme weather events such as droughts and flooding. These manifestations of climate change constitute a serious threat to AJK's natural, built, economic, and physical systems, on which the region's sustainable development and future prosperity depends.

PREPARATION OF IMPLEMENTATION FRAMEWORK

The process of the preparation of the State Implementation Framework followed CSCCC's 'Whole of Government Approach', ensuring that key government departments were involved throughout the process of planning the state level workshop, and subsequently, given the steer in the consultative dialogues itself, to foster collaboration between government, civil society, academia, private sector and the media, all of which were actively engaged in the process.

As a first step, CSCCC secretariat engaged in a pre-workshop consultation with the Planning and Development Department, AJK, on the 4th of October 2017. In this consultation, CSCCC met with key personnel from the P&D department to narrow down the scope of the State Consultation, refine its objectives, and identify key themes for discussion. For greater impact, P&D was requested to nominate officials from government departments linked to climate and environment, while CSCCC would be responsible for ensuring the participation of key stakeholders from civil society, academia and private sector.

Concurrently, following a review of the National Climate Change Policy, the National Implementation Framework for the Implementation of the Climate Change Policy, and the AJK Climate Change Policy, CSCCC developed a set of tools to be implemented during the workshop, i.e. Implementation Framework tool to identify quantifiable actions in line with existing policies, and an MRV Framework to match the identified actions with measurable monitoring indicators. These tools were reviewed by the AJK government as well as CSCCC's roster of experts before finalization.



CSCCC then developed a set of reference materials for each group in the consultative workshop, drawing from the existing policies and SDGs, to ensure that the consultative dialogues were in line with national policies.

Workshop methodology

The structure and design of the workshop was built on the concepts of the Lima-Paris Action Agenda and anchored in the principles of the Open Government Partnership (OGP) that highlight the importance of civil society and emphasises the need for engagement with policy makers in framing policies that are representative, participatory and inclusive. The workshop brought together policy makers and relevant stakeholders from the government, civil society, academia, private sector and the media to set the climate change agenda for AJ&K contextualised in its adaptation and mitigation needs. The inaugural plenary speakers focused on challenges and policy priorities taking into account shared sector specific constraints peculiar to the local geography and topographical range. The threats and opportunities were shared with the audience/participants to amplify concerns and suggest solutions on way forward.

The workshop session was divided into six working groups and tasked with the development of an Implementation and Monitoring, Reporting and Verification Framework aligned with the goals of the AJ&K Climate Change Policy and in consonance with the National Climate Change Policy and Framework. Effort was also made to identify compatible activities that dovetail seamlessly with the SDGs and help in building complementary synergies. Each working group comprised of representatives from the

government and civil society and was gender balanced to make it participatory and inclusive. The six thematic areas for the working groups were based on the key areas of focus in the National Climate Change Policy.

i) Agriculture and Livestock
ii) Disaster Risk Reduction
iii) Health
iv) Water
v) Energy
vi) Environments and Biodiversity.

The recommendations of each table were captured in writing and documented for an accurate compilation of ideas to develop a roadmap for future action. The deliberative exercise and interactive session was successful in preparing a list of suggested activities with timelines to priorities needs (long-term -short term-high-low) and identify potential sources of finance and implementing partners. The collaborative strategy was designed to foster collective ownership and responsibility for planning, implementing and monitoring policies to strengthen climate governance. Existing sources of information and data were used to establish baseline and make future projections.

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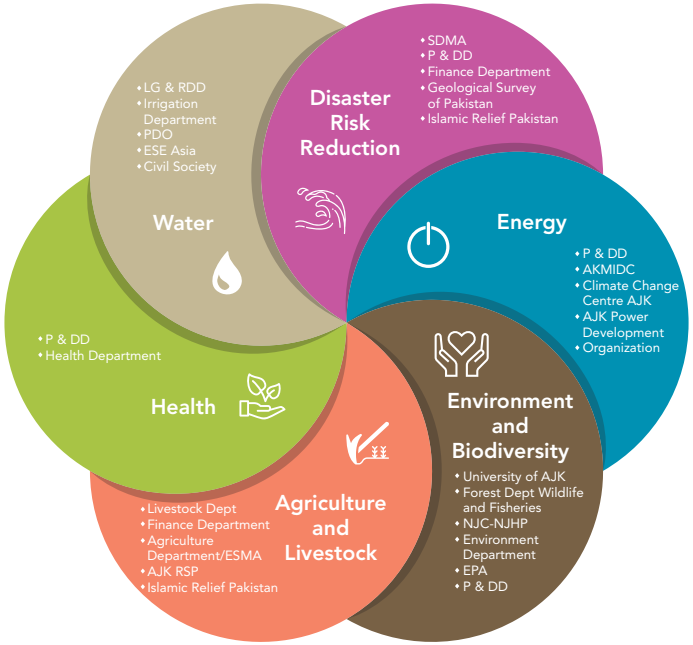

Thematic Division of Climate Induced Challenges

WATER

In total, there are 4 rivers that course through AJK and are an important source of water for the entire state: Jhelum, Neelum, Poonch and Shingo. Rivers and springs are the main drinking water sources in the northern part of the AJK. On the other hand bore wells are the major source of drinking water in the southern part. In the urban areas of AJK, 44 percent of the population has access to piped water supply, while 57 percent of the population of rural areas has been provided with piped water[7].

The earthquake of 2005 was a severe setback to the development of AJK and its infrastructure, and a large number of water supply schemes were completely or partially damaged, as well as impacting a majority of water sources. Although recovery and rehabilitation efforts in AJK have shown encouraging progress, a study by the World Bank in AJK suggests that the poor home hygeine, lack of basic sanitation and unsafe drinking water has impacts on the health of the population and economy, at 3.94% of the GDP. The accessibility of water is also unevenly distributed. The study found that 78% of females, including girls of less than 18 years of age, are responsible for fetching water at the household level, spending up to 15 minutes traveling and queuing at a water source in both rainy and dry seasons.
AJK is home to 239 glaciers with a total area of 92.229 km2, with 76 glacial lakes, most of which are concentrated in District Neelum.

Climate change is expected to severely impact the availability and quality of water resources in AJK. The increase in temperature levels is expected to lead to a shift in weather patterns, including pre and post monsoon storms, heat waves, as well as extended summer seasons, shorter autumn and spring seasons, along with increased water evaporation losses from crops and land cover. The increase in the frequency and intensity of rainfall events will result in a shift in hill slope water movement and river flow patterns, which will lead to more frequent and larger floods, higher risk of GLOF. This will have impacts for water availability not only for local AJ&K, but also for downstream water users in the Punjab. It will also impact community health, livelihoods, hydro power, fisheries and irrigated food production.

Land degradation is another anticipated impact of the changes in AJK's hydrology and hill slope water movement. Frequent and intense rainfall storms along with poor vegetation ground cover will lead to the degradation of soil surfaces on hill slops, leading to short and medium term trends of loss in surface soil infiltration, increased water overland flow and accelerated erosion and decreased water infiltration to sub soils and groundwater aquifers. This will fundamentally deteriorate water quantity and quality in the freshwater inland. This will have dual impacts on crop and land productivity.

At the same time, climate change, with increased rainfall intensity, floods and pollutant transport will impact water quality in inland freshwaters and rivers, linked to negative impacts on drinking and irrigation water supplies, fish populations and dams and other water infrastructure.

Piped Water Supply 2016		
District	Population Served	
	Urban	Rural
Muzaffarabad	52.74	52.74
Neelum	20.99	20.99
Jehlum Valley	18.13	18.13
Bagh	9.79	9.79
Haveli	34.21	34.21
Poonch	12.13	12.13
Sudhnoti	23.81	23.81
Kotli	87.95	87.95
Mirpur	83.76	83.76
Bhimber	50.06	50.06
Total	44.51	44.51

Table 1: Source: PP and H Department and LG and RD Department AJK

[7]/ajk Water Quality Monitoring Report, IUCN, 2004

Implementation Framework for Water

Actions	Target	Priority	Potential Sources of Financing	Implementing Institutions/ Partners	Indicative Timeline	Estimated Budget (USD-Million)
Strategy: Develop and strengthen relevant institutions, policies and frameworks to promote integrated water resource management with special focus on implementation of rules and regulations, financial mechanisms and capacity building						
Initiate development of AJK Water Policy on integrated water resource management (IWRM) approach	To develop a special unit for the development of policy.	• High • Short-term	AJK Planning and Development) P&D	AJK Planning and Development) P&D)	1 Year	10
Launch awareness program for implementation of National Drinking Water Policy and National standards for drinking water at all levels.	Awareness through media, community engagement, civil society support, sensitization of the business community.	• High • Short-term	AJK Planning and Development) P&D)	Local Government Elections and Rural Development Department (LGRDD)	1 Year	10
Invest in use and manufacture of water efficiency equipment's (fixtures and appliances).	Setting minimum standards for using water efficient equipment	• Medium • Medium-term	LGRDD. AJK Technical Education and Vocational Training Authority (TEVTA), National Vocational & Technical Training Commission (NAVTTC)	LGRDD. AJK Technical Education and Vocational Training Authority (TEVTA), National Vocational & Technical Training Commission (NAVTTC)	3 Year	10
Minimizing system losses by improving operational management of canal system for wet, average, and dry season scenarios and by monitoring of water discharges at mogaaz	Measuring and monitoring the losses and developing innovative methods to minimize it.	• Medium • Medium-term	AJK LG (Local Government) & RDD (Rural Development Department)	AJK LG (Local Government) & RDD (Rural Development Department)	2 Year	10

Legislate and enforce principle "polluter pays" for water polluting industries.		• High • Medium-term	AJK Planning and Development, AJK Industries and Commerce Department, Ministry of Water and Power, Planning and Development, EPA	AJK Planning and Development, AJK Industries and Commerce Department, Ministry of Water and Power, Planning and Development, EPA	2 Year	10
Encourage water metering and effective control over wastage of municipal water.		• Medium • Medium-term	LGRDD, WASA	LGRDD, WASA	3 Year	5
Strategy 2: Improve water quality management and protect water resources through technical measures, ensuring sustainable availability of water at macro and micro levels through equitable access of water resources						
Encourage the recycling and reuse of agricultural, industrial and domestic wastewater through efficient and cost-effective scientific techniques such as bio-remediation, sand filtration, reverse osmosis, etc.	Increase the water availability	• High • Short-term	AJK LG & RDD, Ministry of Water and Power, Planning and Development Department, PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES (PCRWR), Public Health Engineering Department PHED	AJK LG & RDD, Ministry of Water and Power, Planning and Development Department, PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES (PCRWR), Public Health Engineering Department PHED	1 Year	150
Initiate Programs for monitoring of groundwater, including its quality, quantity, withdrawal, and recharge potential	Initiate groundwater policies.	• High • Medium-term	AJK EPA, PCRWR	AJK EPA, PCRWR	2 Year	150
Adoption of high-efficiency irrigation system techniques, e.g. sprinkle and drip irrigation		• High • Medium-term	Agricultural Department		3 Year	10

Implementation Framework for Water

Actions	Indicators	Baseline *(What is the current value?)*	Target *(What is the target value?)*	Means of *Verification (How will it be measured?)*	Frequency *(How often will it be measure?)*	Responsibility (Who will measurer?)	Reporting *(Where will it be reported?)*
Initiate development of AJK Water Policy on integrated water resource management (IWRM) approach Launch awareness program for implementation of National Drinking Water Policy and National standards for drinking water at all levels. Invest in use and manufacture of water efficiency equipment's (fixtures and appliances).	To develop a special unit for the development of policy.	0	1 Stage Policy	Implementation of Policy	Annually	AJK Planning and Development) P&D)	Annual State development report.
	Awareness campaign after every month in different districts on AJK	15 awareness campaign	30	Measure the outcomes and benefits of these campaigns. Initiatives after the campaign	Quarterly	Local Government Elections and Rural Development Department (LGRDD).	Annual State development report.
	Number of equipment installed.	0	100	How much water is saved by using this equipment. Baseline survey and survey after	Annually	LGRDD. AJK Technical Education and Vocational Training Authority(TEVTA), National Vocational & Technical Training Commission (NAVTTC)	Annual Report
Minimizing system losses by improving operational management of canal system for wet, average, and dry season scenarios and by monitoring of water discharges at mogaaz Legislate and enforce principle "polluter pays" for	Methods to improve operational management canal system.			How many systems have been improved	Annually	AJK LG (Local Government) & RDD (Rural Development Department)	Annual Report
	Minimum 100 polluters should be identified.	0	100	Check if the identified polluters paying or not	Quarterly	AJK Planning and Development, AJK Industries and Commerce Department, Ministry of Water and Power, Planning and Development, EPA	Annual Report

water polluting industries. Encourage water metering and effective control over wastage of municipal water. Encourage the recycling and reuse of agricultural, industrial and domestic wastewater through efficient and cost-effective scientific techniques such as bio-remediation, sand filtration, reverse osmosis, etc. Initiate Programs for monitoring of groundwater, including its quality, quantity, withdrawal, and recharge potential	Measure volume of water used by residential and commercial buildings that are supplied with water by a public water supply system	0		Annually analysis of which sector use the most water and how can it be reduced.	Annually	LGRDD, WASA	Annual Report
	How much water is recycled				Annually	AJK LG & RDD, Ministry of Water and Power, Planning and Development Department, PAKISTAN COUNCIL OF RESEARCH IN WATER RESOURCES (PCRWR), Public Health Engineering Department PHED	Annual Report
	One program in each district	0	29		Annually	AJK EPA, PCRWR	Annually

DISASTER RISK REDUCTION

Climate change is a prime factor for accelerated glacial melt and retreat, which is resulting in the formation of hazardous glacial lakes in the Himalayas, which are geologically young and fragile and are vulnerable even to insignificant changes in the climate. This is resulting in shrinking glaciers, which is leading to the increased threat of GLOF, avalanches and mud flow and floods to downstream areas.

There is also the risk of drought due to the reduced river flows due to climate change induced drought and unreliable rain. If these droughts are extreme and prolonged, they may lead to loss of livestock, crop failure, impact fish populations and drinking and irrigation water supplies. In turn, these impact the arable land cover, which has implications for food production and nutritional value of the crop- leading to food and economic insecurity.

Increased variability of rainfall fall events, changes in their frequency and intensity, as well as the melting of glaciers, result in flooding in AJK. Floods, other than impacting crops, farm equipment, and killing livestock, also increases the incidence of diseases and insects/pests. The excessive soil erosion arising from this result in the reduction of arable lands, which negatively affects food production, food quality and nutritional availability in the crops that in turn, impacts food and economic security. Along with this are the direct impacts in the loss of life, property, physical infrastructure, including buildings, roads, dams, water pipes and other critical infrastructure.

Implementation Framework

Strategy # 1	Incorporate hazard mitigation policies					
Actions	**Target**	**Priority**	**Potential Sources of Financing**	**Implementing Institutions/ Partners**	**Indicative Timeline**	**Estimated Budget (USD-Million)**
Prepare an integrated natural hazard zoning map	All Province	High	SDA	SDMA P&D Department	2 Year	5
Identify low floods risk areas for future land use planning.	All Province	High	SDMA Irrigation Departments Ministry of Water & Power	SDMA Irrigation Departments Ministry of Water & Power	1 Year	1
Identify safe areas for evacuation of people and livestock in each vulnerable locality	All Province	High	SDMA	SDMA P&D Department	1 Year	1

Update river laws to protect Streams, rivers banks and its flood plain areas from encroachments	All Province	High	SDMA Communication, works, Physical Planning and housing department	Communication, works, Physical Planning and housing department	5 Year	1
Strategy # 2	**Public Awareness And Media Contribution**					
Actions	**Target**	**Priority**	**Potential Sources of Financing**	**Implementing Institutions/ Partners**	**Indicative Timeline**	**Estimated Budget (USD-Million)**
Develop a State Media Strategy on DRR	All State	High	PDMA	Information Department, PDMA, Media Houses, Community	3 Year	5
Conduct special emergency handling situation training programs for NGOs and volunteer organizations	50 NGOs	Medium	National and International Donors PDMA	PDMA	3 Year	5
Conduct special awareness campaigns for different segments of society and particularly for those communities living in vulnerable areas, through radio, TV, print media and participatory workshops	25 Districts of AJK	Medium	Information Department, PDMA, Media Houses, Community	Information Department, PDMA, Media Houses, Community	4 Year	3
Develop climate change curricula with particular emphasis on Disaster Risk Reduction (DRR) and introduce it into formal education system at all levels.	All State	High	Education Department Local and international Donors P&D Department PDMA	Education Department PDMA	3 Year	2

Strategy # 3	Strengthening the Early warning system					
Actions	**Target**	**Priority**	**Potential Sources of Financing**	**Implementing Institutions/ Partners**	**Indicative Timeline**	**Estimated Budget (USD-Million)**
Improvement in real-time meteorological and hydrological data collection and processing for understanding natural processes and evolving disasters.	All State	High	PDMA Science & Information Technology, PAK-MET GCISC	PDMA PAK-MET	2 Year	10
Development of SOPs for line department for DRR	All line Departments	High	Line departments	PDMA P&D	3 Year	0.5
Upgrade and expand weather monitoring station network in the State	All State	High	PDMA PAK MET	PAK MET	5 Year	20
Establish regional flood forecasting and warning centres at divisional Level	All State	High	PAK MET Irrigation	PAK MET	5 Year	5
Strategy # 4	**Invest in disaster resilient infrastructure**					
Actions	**Target**	**Priority**	**Potential Sources of Financing**	**Implementing Institutions/ Partners**	**Indicative Timeline**	**Estimated Budget (USD-Million)**
Plan, design, construct and strengthen appropriate flood embankments, dykes, protective bunds to protect flood plains	Construct flood embankments, dykes, protective bunds to protect flood plains at 80% flood vulnerable spots.	High	PDMA Irrigation Department P&D Department National and international Donors	Irrigation	5 Year	20

Actions	Target	Priority	Potential Sources of Financing	Implementing Institutions/ Partners	Indicative Timeline	Estimated Budget (USD-Million)
Construction of Resilient multipurpose school Building	10 per District	High	Education P&D	Education	3 Year	25

MRV Framework for DRR

Strategy # 1	Actions	Indicators	Baseline	Target	Data Source	Frequency	Responsibility	Reporting
Incorporate hazard mitigation policies	Prepare an integrated natural hazard zoning map	# of Natural hazard maps prepared by each district	No hazard Mapping available	All Districts	DDMA	Every Six Month	PDMA PAK MET P&D	Province Natural Hazard Mapping Report
	Identify low floods risk areas for future land use planning.	# of areas flood risk areas for future land use planning	No hazard Mapping available	All landslide vulnerable areas	DDMA	Every Year	DDMA	Vulnerability assessment
	Identify safe areas for evacuation of people and livestock in each vulnerable locality	# of safe areas for evacuation of people and livestock in each vulnerable district	No baseline available	All districts of province	DDMA	Every six month	DDMA	District disaster risk reduction plan
	Update river laws to protect Streams, rivers banks and its flood plain areas from encroachments	# of updated laws	No baseline available	All districts of province	PDMA Irrigation department	Every six month	DDMA	Province Natural Hazard Mapping Report

Strategy # 2	Actions	Indicators	Baseline	Target	Data Source	Frequency	Responsibility	Reporting
Public Awareness And Media Contribution	Develop a Provincial Media Strategy on DRR	Media strategy on DRR	There is media strategy for DRR	Develop a comprehensive media strategy to address the DRR challenges in Baloshistan	PDMA Media Houses Information department	Once	Information department	Media Strategy
	Conduct special emergency handling situation training programs for NGOs and volunteer organizations	# of training organized # of NGOs and Volunteer participated in trainings	20% NGOS and Volunteer organization currently involve in DRR trainings	50 organizations will participate in emergency trainings	NGOs Volunteer organizations PDMA	Quarterly	P&D PDMA	Activity Reports
	Conduct special awareness campaigns for different segments of society and particularly for those communities living in vulnerable areas, through radio, TV, print media and participatory workshops	# of awareness session organized in different communities related to DRR and Climate change	No specific data available in this regard	Awareness session will be organized in 25 most disaster vulnerable districts of AJK	NGOs, INGOs Volunteer organizations PDMA	Quarterly	P&D PDMA	Activity Reports
	Develop climate change curricula with particular emphasis on Disaster Risk Reduction (DRR) and introduce it into formal education system at all levels.	Media strategy on DRR	Not available	This curriculum will serve for whole province	Education Department	Every six Month	Education department	Year education index

Strategy # 3	Actions	Indicators	Baseline	Target	Data Source	Frequency	Responsibility	Reporting
Strengthening the Early warning system	Improvement in real-time meteorological and hydrological data collection and processing for understanding natural processes and evolving disasters.	# of districts from where in real-time meteorological and hydrological data collected for monitoring, Prediction and timely early warning of the aforementioned extreme events	Data is not available on districts level	All districts of AJK province	PAK MET	Every SIX month	PDMA	Early warning system annual report
	Development of SOPs for line department for DRR	# of departments develop their SOPS with regard to DRR and Climate change	4-5 department have their SOPS for DRR	All government department will prepare their SOPS with regard to DRR	All line department	Every six Month	PDMA	Departments DRR SOPs
	Upgrade and expand weather monitoring station network in the Province	# or Weather monitoring station upgraded # of new weather monitoring stations		updated weather monitoring station all over AJK	PAK-MET	Every six Month	PAK-MET	Department Annual Report
	Establish regional flood forecasting and warning centres at divisional Level	# of flood forecasting and warning center established and regional and divisional level		7 divisions of AJK	Irrigation Department PDMA	Every six Month	PAK-MET Irrigation	Department Annual Report

Strategy # 4	Actions	Indicators	Baseline	Target	Data Source	Frequency	Responsibility	Reporting
Disaster resilient Infrastructure	Plan, design, construct and strengthen appropriate flood embankments, dykes, protective bunds to protect flood plains	# of flood embankments, dykes, protective bunds constructed to protect flood plains		80%	Irrigation	5 Years	PDMA	PDMA Annual Reports
	Construction of Resilient multipurpose school Building	# of flood embankments, dykes, protective bunds constructed to protect flood plains			Education	3 Years	Education	Education department annual reports

ENERGY

With 4 major rivers coursing through the state, AJK has considerable Hydro power potential. In 2015, the installed Grid Capacity was 677.3 MVA, with a per capita electricity consumption of 353 KWH. 25,861 km transmission lines have been extended to 1670 villages out of a total of 1771 villages, serving 4.267 million people with electricity supply.

The Government of AJK continues to invest in hydro power and has identified potential of hydro power generation of 8695.46 MW of electricity using its natural resources (Power and Development Organization, AJ & K).

The water-energy nexus in the state is contributing to bring the share of hydro power generation in the complicated total energy mix of Pakistan to about 50% from the current 33%. The 969 MW Neelum Jhelum Hydropower Project, which is inching towards completion will contribute greatly to this, upon its completion, the project will contribute about five billion units of electricity to the national grid annually. Annual revenue of the project is estimated to be Rs 50 billion. However, increased variability in the hydrology of the State as well as the destruction of the critical infrastructure due to extreme weather events may impact energy production particularly hydel energy. However, the AJK climate change policy focuses on the reduction of GHG emissions, calling for changes in the energy mix as an opportunity to reduce carbon emissions in the AJK energy sector.

Hydro Power Potential AJK (2016)		
Status of Projects	**No**	**Capacity (MW)**
Commissioned	21	1393.02
On Going	16	1943.86
Upcoming	57	5806.82
Total	94	9143

Table 2: Power and Development Organization, AJ&K

Implementation Framework

Actions	Target	Priority	Potential Sources of Financing	Implementing Institutions/ Partners	Indicative Timeline	Estimated Budget (USD-Million)
Strategy: Strengthening of relevant institutions, policies, rules and regulations, financial mechanisms, innovative and accessible resources for energy efficiency						
Enhance Public private partnership and investment for energy efficiency.	Agro sector, household utilization appliances, transport sector, NEGs.	High/Long	Federal govt., provincial govt., private sector, foreign funding, NEECA, energy dept., govt. Of AJK.	Energy efficiency, energy dept., local govt., rural development.	3-5 Year	20
Create awareness regarding advantage of solar PV systems for ensuring undisrupted supply of energy for domestic and commercial use	Awareness through media, community engagement, civil society support, sensitisation of business community.	High	Govt. of AJK, donor agencies, private investors, micro finance banks, banking institutions.	Energy efficiency, energy dept., local govt., rural development, NGOs, social welfare private investors,	3-5 Year	15
Attract foreign direct investment, FDI in energy rector in order to meet up the resource gap in public sector.	Improvement in energy infrastructure. Creation of employment. Development of local industry. Improvement of invested polices. Access of affordable energy to the community.	High	Federal, govt., provincial govt., PPP, private investors.	PND, ED, EAD, GP, PPP unit, FD, federal agencies, federal ministry of finance.	5-10 Year	18

Actions	Target	Priority	Potential Sources of Financing	Implementing Institutions/ Partners	Indicative Timeline	Estimated Budget (USD-Million)
Strategy: Promote R and D for clean energy technology, and tap Pakistan's huge potential for indigenous and renewable resources and technologies such as micro-hydel, bio fuel, solar, wind, geothermal and hydrogen energy						
Establish centre of excellence to explore possibilities and option for proper generation through innovative and energy clean.	Research centre at division level. Research action at engineering universities. Research related motivational approach among students. Engagement of private sector, engagement of foreign certified labs for bringing knowledge.	High	Govt. of Pakistan, provincial govt., donor agencies.	Universities, provincial dept., NGOs, private universities, research and training institutes.	3-5 Year	200
Install plants to generate power from municipal waste.	Select one at each administrative division at potential sites.	High	Govt. of AJK, local govt. corporations, local and foreign inventors	ED, PPP FD, LG, MC, federal govt.	3-5 Year	50
Prepare baseline primary data on solar, biogas, wind and hydrogen energy potential	Baseline of renewable energy potential in AJK	High	As above	As above	2 Year	10

MRV Framework for Energy

Actions	Indicators	Baseline *(What is the current value?)*	Target *(What is the target value?)*	Means of *Verification (How will it be measured?)*	Frequency *(How often will it be measured?)*	Responsibility (Who will measurer?)	Reporting *(Where will it be reported?)*
Enhance PPP investment for energy efficiency.	Replacement and installation of efficient energy appliances at micro or macro level.	Saving of up to 500 MW.	Saving up to 1000 MW.	DISCOS, power development cell, ED, electricity dept., evaluation cell		Ministry of power and provincial energy depts...	Annual energy Report
Create awareness regarding advantage of solar PV system	Monthly media campaign Awareness program Quarterly meeting with business authority.	15 awareness campaign	30	Federal Moe, provincial dept.		Federal MoE, ED, local govt., rural development, social welfare.	Annual provincial development report.
Attract foreign direct investment, FDI in energy rector in order to meet up the resource gap in public sector.		USD 200M.	USD 500 M.	MoE, MoF, EAD.		MoF, Gop, provincial, ebergy dept., FD, PND.	Annual energy and finance report.
Establish center of excellence to explore possibilities and option for proper generation through innovative and energy clean.	Establishment of state of the art research at engineering universities.	USD 50 M.	USD 100 M.	Provincial higher education commission, STEVTA.		Provincial higher education commission. ED	Provincial higher education commission.
Install plants to generate power from municipal waste	6 MSW power generation power plants.	USD 100 M	USD 150 M.	MOE, GOP		MOE, GOP, GOS, ED MSW, local govt.,	Annual energy report.

FORESTS AND BIODIVERSITY

The total area of AJK under the control of the Forest Department is 0.567 million hectares, making up 42.6% of the total geographical area. 13% of the area is under cultivation, 2.4% is classified as cultivable waste, while 42% is uncultivable waste. AJK is home to 8 National parks, namely Deva Vatala, Ghamot, Gurez, Machiara, Pir Lasura, Poonch River Mahaseer, Toli Pir, and Panjal Mastan, as well as game reserves and wildlife sanctuaries. In addition to this, fisheries in the main rivers are an important part of the biodiversity of AJK, which is also rich in wildlife species diversity.

Increasing temperatures, resulting in ecological shifts, as well as changed land use pressures, also a result of climate change, result in the degradation of watersheds, forests, rangeland and other essential biodiversity. AJK is facing rapid deforestation, some of which is due to anthropogenic deforestation. At the same time, soil erosion, natural disasters and other extreme weather events lead to a shift in the tree line. There is an increased incidence of invasive species and pests in the forest areas. Scrub trees are encroaching in Chir-pine areas. Chir pine trees are encroaching the areas previously for blue pine trees, which are encroaching the areas for Silver fir. Deodar forests are migrating to sub alpine areas. There is also an increased incidence of forest fires in southern AJ&K.

There are also changes anticipated in wetlands and fisheries, due to changes in the hydrology and temperature of AJK. A number of indigenous plant species are already being identified as endangered due to the impacts of climate change and habitat fragmentation.

Another impact of the degradation of rangelands and decreasing plant diversity has led to increased migration of pastoralists and other communities. These pastoralists are dependent on natural resources, and are directly impacted by the changes in the ecosystem.

Total Area Under Protected Areas		
Description	**No**	**Area**
National Parks	8	101441
Game Reserces	11	13664
Wildlife Sanctuary	1	185
Zoo/Captive Breeding Centres	4	16
Fishery Facilities and Fish Production		
Cold Water Fish Hatcheries	6	50000 fingerlings
Warm water fish hatcheries	2	500000 fingerlings
Fish pond in private sector	298	27 total
Fish Production in Govt Sector	From all fresh Water including Mangla	1100 total
Wildlife Species Diversity in AJ&K		
Description	Wildlife Species in Pakistan	Wildlife species in AJ&K
Mammals	198	60
Wildlife Birds	666	403
Fish	1198	82
Reptiles	245	48
Amphibians	25	21

Table 3: Source: Forest Department AJ&K

Implementation framework for Forests and Biodiversity

Strategy # 1 Sustainably manage forests, combat desertification, halt desertification and reverse land and forest degradation and biodiversity loss

Actions	Outcomes	Priority	Potential/ Innovative Sources of Financing	Lead Implementation Institutions	Partner Institutions	Indicative Timeline	Estimated Budget (USD-Million)
Mobilize and significantly increase financial resources to conserve and sustainably use biodiversity	**Finances available for conservation and biodiversity conservation**	High/short term	WWF, UN agencies, GCF	Forest Departments, P and DD department, Provincial Agricultural departments	Academia, Finance departments	2 Years	0.5
Set biodiversity indicators and tap financial resources for implementation of Biodiversity Action Plan	**Implementation of biodiversity action plan resulting in measurable progress in conservation**	High/short term	As above	As above	Academia, Finance departments	2 Years	2
Encourage empirical research on flora and fauna in the context of their responses to current and historical climatic changes and ecosystem conservation	**Evidence generated to support conservation of ecosystems against climate change impacts**	High/short term	IFAD, FAO	As above	As above	2-3 Years	2

Process, approve and implement the draft National Forest Policy and carry out intensive institutional and legal reforms both at the federal and provincial levels to promote good forest ecosystem management	**Policy frameworks supporting protection of forests**	High/medium term	As above	Forest Department, Ministry of Climate Change	Forest departments at district level, agriculture departments, EPA	3-5 Years	1 million
Promote sustainable forest management of all types of forests to halt deforestation and restore degraded forests by developing and implementing sustainable forest management plans	**Reduction in deforestation**	High/medium term	As above	Ministry of climate change, Forest Departments, WWF, IUCN	Line departments	3-5 Years	10
Promotion of REDD+ program in AJK	**Reduction in emissions from deforestation, measureable**	High/medium	REDD+, GCF, GEF	As above	Forestry departments	3-5 Years	10
Protection and preservation of watersheds, catchment areas for aquifers, national wetlands	**Conservation of water**	High/long term	Adaptation Fund, UN agencies, WWF	As above	Irrigation departments, WASA, PHED departments, forest departments	5-10 Years	10

MRV Framework

Strategy # 1	Actions	Indicators	Baseline	Target	Means of Verification	Frequency	Responsibility	Reporting
Sustainably manage forests, combat desertification, halt desertification and reverse land and forest degradation and biodiversity loss	**Mobilize and significantly increase financial resources to conserve and sustainably use biodiversity**	Amount of finance available and sources	Limited data available	Increase mobilization of finance by at least 70% from current sources	Reciepts/ budgets	Quarterly	Environment Department, Forest Departments	Annual Reports for Forest, Annual Budget
	Set biodiversity indicators and tap financial resources for implementation of Biodiversity Action Plan	Biodiversity action plan developed and financed	Draft action plan	Complete action plan with financial/ budgets	Consultation reports/final plan	Quarterly	Environment Department, Forest Departments, EPA	As above
	Encourage empirical research on flora and fauna in the context of their responses to current and historical climatic changes and ecosystem conservation	Research papers with evidence of climate change impacts	Limited research available	Comprehensive data on climate impacts on ecosystems	Final research papers	Quarterly	As above	As above

Strategy # 1	Actions	Indicators	Baseline	Target	Means of Verification	Frequency	Responsibility	Reporting
	Process, approve and implement the draft National Forest Policy and carry out intensive institutional and legal reforms both at the federal and provincial levels to promote good forest ecosystem management	Institutional and legal reforms in place regarding forest management	No policy	Policy in place with reforms and institutional mechanisms in place	Final policy, legal reforms, consultative workshop reports	Quarterly	Forest Department, Ministry of Climate change, EPA	Annual reports by department
	Promote sustainable forest management of all types of forests to halt deforestation and restore degraded forests by developing and implementing sustainable forest management plans	Reduction in deforestation rates	Unreliable data	At least 10% reduction in deforestation	GIS data, forest records	Quarterly	Ministry of climate change, Forest Departments, EPD	Annual Reports Forest Department
	Promotion of REDD+ program in AJK	Reduction in emissions from deforestation	Limited data	10% reduction against current	Emissions profile of Pakistan, Forest cover data	Ministry of climate change, Forest Department	Quarterly	REDD plus reports, Forest Department reports
	Protection and preservation of watersheds, catchment areas for aquifers, national wetlands	Reduction in emissions from deforestation	Limited data	10% reduction against current	Emissions profile of Pakistan, Forest cover data	Ministry of climate change, Forest Department	Quarterly	EPA annual report

HEALTH

The current health systems in place in AJ &K are insufficient to cater fully to the needs of its population, although gradual improvements have been noted. The population per doctor is 4565-and the number of persons per hospital bed is 1105. These figures indicate the inadequacy of the current system, particularly in face of disasters and epidemics.

The AJK climate change policy identifies three main categories of health risks due to climate change. These include direct acting effects e.g. due to physical weather disasters, impacts mediated via climate related changes in ecological systems and relationships (e.g. mosquito and ticks, and iii. Indirect consequences relating to poverty, displacement, resource conflicts and post disaster mental health problems.

As the incidents of floods and other extreme events increase in the provinces, the risk of death and injuries arising from these disasters also rises. Along with these are other health implications such as diarrheal diseases due to insufficient clean water availability for drinking and household use. Post traumatic disorders are also common among those impacted by disasters. The rise in vector borne diseases such as malaria, dengue fever and congo fever, which are sensitive to temperature and rainfall, may increase with the expected changes in climate.

The policy also note the disproportionate impacts, as they have less access to medical services, and their workloads increase when they have to spend more time caring for the sick. Cultural issues add to their vulnerability, as women are more vulnerable to health risks due to inequitable food distribution in families.

Health (2016)	
Facilities	**No**
Hospitals	24
DHQs	06
THQs	11
Dispensaries	96
RHCs	49
BHUs	225
Malaria Centers	167
Total Beds (RHCs+BHUs+Hospitals)	3658
Population per Bed	1105

Table 4: Source Directorate of Health Department, Muzaffarabad

Medical Personnel (2016)	
Facilities	**No**
Doctors (including medical specialists, officers and health managers)	886
Doctors (Male)	637
Doctors (Female)	249
Population per doctor	4565
Nurses	370
Health Teachers/MCH/LHVs	337

Table 5: Source: Directorate of Health Department, Muzaffarabad

Implementation Framework for Health

Strategy # 1 Draft, prioritize and implement district wise health, heat and disaster management plans which help to reduce risk to human health from climate induced disaster and disease.

Actions	Outcomes	Priority	Potential/ Innovative Sources of Financing	Lead Implementation Institutions	Partner Institutions	Indicative Timeline	Estimated Budget (USD-Million)
Risk Assessment	District wise data base.	High/Short-term	WHO, Global fund, Health department, CSO's.	Health department AJK.	Public health department, Academia, think tanks.	3 Months	1 million p/ district.
Devise health management action plan	Health specific framework.	High/medium term	WHO, Global fund, Health department.	Health department AJK, Public Health specialist.	WHO, Civil Society organizations, Ministry of health, private practitioners.	3 Months	2 million.
Relevant Legislative Changes	Reduction in factors that cause health risks.	High/long term	WHO, Global fund, Health department.	Advocacy groups, CSO's, Environmental lawyers, rovincial govt	WHO, Civil Society organizations, Ministry of health, private practitioners.	1 Year	2 million.
Relevant Legislative Changes	Reduction in factors that cause health risks.	High/long term	WHO, Global fund, Health department.	Advocacy groups, CSO's, Environmental lawyers, rovincial govt	WHO, Civil Society organizations, Ministry of health, private practitioners.	1 Year	2 million.

***Priority: ranking (high, medium and low) and (short-term, medium-term and long term)**

Actions	Outcomes	Priority	Potential/ Innovative Sources of Financing	Lead Implementation Institutions	Partner Institutions	Indicative Timeline	Estimated Budget (USD-Million)
Strategy # 2 Conduct needs assessment of the health sector, identifying infrastructure, human resource and financial human resource required by sub urban and rural health facilities to equip them to handle climate induced disease and disaster.							
Assessment of health infrastructure and human capital.	Capacity assessment of the nfrastructure and Human capital in Health	High/short term	International organization, health dept.	Health officials, think tanks, academia.	Health officials, think tanks, academia.	6 months	0.2 Million / p district.
Strategy # 3 Take measures to reduce waterborne diseases and insure access to safe clean drinking water							
Conduct assessments on the impacts of climate change on vector/ waterborne and nutritional diseases.	Impact Assessment Report of multiple domains	High	Health Department, P&D Department, National and international Donors	Health Department	Health, CSOs,INGOs Health	1 Year	50 Million
Use media and civil society organizations to educate and sensitize public as well as health personal to the climate change related health issues particularly	Reduction water borne diseases.	High	Health Department, P&D Department, National and international Donors	Information and Culture	Health, CSOs, INGOs Health	2 Year	20 Million
Strategy # 3 Take measures to reduce waterborne diseases and insure access to safe clean drinking water							
Design communication strategies to inform the general public of climate change related health hazard and its geographical span, particularly, alerting health personnel in the vicinity.	Public Awareness and capacity building regarding Heath and Climate change	High	Health, P&D Department, National and international Donors	Health Department	Health, P&D Department, National and international Donors	2 years	20 Million

MRV Framework for Health

Strategy # 1	Actions	Indicators	Baseline	Target	Data Source	Frequency	Responsibility	Reporting
Draft, prioritize and implement district wise health, heat and disaster management plans which help to	**Risk assessment**	Public health data base/ data of AJK's districts.	There is no climate change related baseline available in AJK.	36 districts	General populations, health institutions, CSO's.	Annual	Health department AJK.	Annual health risk assessment report.
	Devise health disaster management action plan.	END epidemic/ climate change disease, expand/build capacity 60-70% health service providers.	No disaster management plan available for health.	Substantially reduce the number of death due to climate change and disaster.	District wise disease incidence report.	Plan reviewed every year.	Health department.	Health disaster management report.
	Relevant legislative changes regarding health.	Number of legislative changes for health.	Environmental laws	Reduction of carbon emission and other factors resulting environmental degradation.	PA	Continuous review	Law makers, CSO, Academia	Passage of law
Strategy # 2	**Actions**	**Indicators**	**Baseline**	**Target**	**Data Source**	**Frequency**	**Responsibility**	**Reporting**
Conduct needs assessment of the health sector, identifying	**Assessment of health infrastructure and human capital.**	# of Health and climate change related Assessment survey conducted	h	All AJK	District Health authorities' record. District Disease surveillance record.	Quarterly	Health Department	District Health Information System (DHIS). Reports

Strategy # 3	Actions	Indicators	Baseline	Target	Data Source	Frequency	Responsibility	Reporting
Take measures to reduce waterborne diseases and insure access to safe clean drinking water	**Conduct assessments on the impacts of climate change on vector/ waterborne and nutritional diseases.**	# or reports prepared		80% reduction in the cases of waterborne diseases	District Health Information System (DHIS).	Every Six Month	Health Department	Disease surveillance system
	Use media and civil society organizations to educate and sensitize public as well as health personal to the climate change related health issues particularly	# of awareness program arranged by Media # or awareness session organized for community by civil society.	No data available currently on this indicator	70-80 % Public and health personals will be aware of the health issues related to climate change	Knowledge assessment studies	Every Six Month	Health Department	Annual health risk assessment report.
	Use media and civil society organizations to educate and sensitize public as well as health personal to the climate change related health issues particularly	# of awareness program arranged by Media # or awareness session organized for community by civil society.	No data available currently on this indicator	70-80 % Public and health personals will be aware of the health issues related to climate change	Knowledge assessment studies	Every Six Month	Health Department	Annual health risk assessment report.
Strategy # 4	**Actions**	**Indicators**	**Baseline**	**Target**	**Data Source**	**Frequency**	**Responsibility**	**Reporting**
	Design communication strategies to inform the general public of climate change related health hazard and its geographical span, particularly, alerting health personnel in the vicinity.	# of Communication Strategies develop	No communication strategy available at provincial level	1 communication strategy for general Pubic and 1 communication strategy health personal	Health Department P&D Department	Quarterly	P&D Department	Final Communication Strategies

AGRICULTURE AND LIVESTOCK IN AJK

Agriculture in AJK is primarily rain fed, and therefore extremely vulnerable to changing weather patterns. The AJK climate change policy notes that the crop growth cycle is affected by temperature, precipitation and duration of chilling. Increases in temperature speed up the crop growth and shorten the time between sowing and harvesting, which impacts the productivity of crops and fodder for livestock.

The impacts of climate change on the hydrological cycle will also impact agriculture and livestock, particularly in the rain fed areas. In particular, women pay a vital role in securing good and income through cropping and livestock farming, working on their own and others lands in a variety of tasks including threshing, cleaning, drying, storing and growing vegetables and winter crops. Livestock handling is usually tasked to females, as well as grass cutting, livestock rearing including feeding the animals. Erratic rainfall and temperatures directly impact these groups. In some of the high snowfall areas increased temperature and reduced snowfall has resulted in increasing opportunities for growing crops such as maize.

Land Utilization (2016)	
Categories	**Area (Hectares)**
Total Farm Area	640957
Farm Area Per Family	2.0098
Farm Area per Capita	0.2354
Area under cultivation	197683
Annual Cropped Area	239350
Non Irrigated	185578
Area Irrigated Area	12103
Area under Maize Cultivation	99631
Area under wheat	81680
Area under rice	2544
Area under Jawar	34
Area under vegetables	3486
Area under fruit	13095

Livestock (2016)	
Cattle	562903
Buffaloes	691200
Sheep	240277
Goats	1720757
Camels	586
Horses	12148
Mules	7707
Donkeys	57293
Poultry	4291119

Table 6: Source: Livestock Department, AJK

Implementation Framework for Agriculture and Livestock

Actions	Target	Priority	Potential Sources of Financing	Implementing Institutions/ Partners	Indicative Timeline	Estimated Budget (USD-Million)
Strategy 1: Adopt sustainable agriculture practices, technologies for sustainable production systems and to meet food security						
Focus on improving water use efficiency for irrigation through using sprinkler and trickle irrigation etc.	25 UC	High/short term	UN, World Bank	PAD, agriculture dept.	3 Year	7
Introduce training programs for exposing farmers to international successful farming practices	Whole province	High/short term	IFAD, WFP	PAD, agriculture dept. PP	3 Year	7
Formulate AJK Food Security Policy followed by strategic action plan	Policy for all districts	High/medium term	FAO	Govt. of AJK, donors	2 Year	5
Encourage agro forestry, floriculture and social forestry	All districts	medium	IFAD, WFP, FAO	P and D department, Forestry Department, Agriculture Department	3 Year	10
Encourage access to export markets by facilitating packaging and eco labeling of agriculture products	60%	High/long term	Private sector	Seed sector, research extensions, P& D, donors, Export regulatory authorities	5-10 Year	6
Strategy: Reduce food loss and waste and ensure quality nutrition						
Enhancing capacity building of PPD.	30%	High	PT, donors	**PPD, Agriculture Departments**	3 Year	4
Environment friendly pesticides	5-10%	High	Pro, F, donors	**Irrigation and agriculture departments**	5 Year	7
Legislation on food standards	Legislation passed	Medium	Donors	**Agriculture, irrigation, PHE departments**	3 Year	3

Actions	Target	Priority	Potential Sources of Financing	Implementing Institutions/ Partners	Indicative Timeline	Estimated Budget (USD-Million)
Increase and ensure protection and preservation of prime agricultural land and combat desertification and drought						
Develop AJK Land Use Policies to protect land use planning and zoning of agricultural land	Policy covering all districts	High/short term	IFAD, FAO, Other donors	**EPA AJK, Forestry Department, Agriculture Departments**	1 Year	2
Employ Environmentally sound multi cropping and crop management practices from traditional to high value economic crops	Area specific	High/short term	As above	**As above**	5-10 Years	2
Control soil problems such as water logging, salinity, sodicity and soil structure deterioration	10 districts	High/short term	As above	**As above**	3-5 Years	3.50
Develop capacity of institutions on remote sensing and GIS techniques to assess temporal changes in land cover of different agro ecological zones	Relevant institutions in all districts	High/short term	As above	**As above**	5-10 Years	3

MRV Framework for Agriculture and Livestock

Actions	Indicators	Baseline *(What is the current value?)*	Target *(What is the target value?)*	Means of *Verification (How will it be measured?)*	Frequency *(How often will it be measured?)*	Responsibility (Who will measurer?)	Reporting *(Where will it be reported?)*
Focus on improving water use efficiency for irrigation through using sprinkler and trickle irrigation etc.	Number of landholders with improved water efficiency	Current area (unknown	+-20%	Reports /data, pictures	Annually	Agriculture Department, water department, PHED department, irrigation departments	Agriculture statistics books.
Introduce training programs for exposing farmers to international successful farming practicesFormulate AJK Food Security Policy followed by strategic action plan	Farmers with improved cropping patterns	<1%	+- 5%	Field survey pictures/numeric data.	Quarterly	As above	Agriculture statistics books.
	Food security plans in place	None	Policy developed for all districts	Policy	Quarterly	Ministry of Food Security, EPA, Agriculture departments, irrigation departments	Food security policy
Encourage agro forestry, floriculture and social forestryEncourage access to export markets by facilitating packaging and eco labeling of agriculture products	Area under cultivation yield and water table.	50-60% acres	100 area distribution	Survey area data	Bi-annually	CRS	Annual report
	Export of sustainable produce	15-20%	60%	Export data	Quarterly	CRS	Annual report
Enhancing capacity building of PPD.	Trained staff	No baseline available	At least 60% of staff trained	Attendance sheets, training reports, evaluations	Bi annually	Agriculture, irrigation and PPD departments	Annual reports
Environment friendly pesticides.	Agric. Bank Uptake Data Fertilizer company	Unknown >2%	50% farmers	Third part evaluation	Monthly	Agric. bank and agric. Dept.	Annual report

Legislation on food standards	Legislation passed on food standards	No data	Legislation passed	Reports from legislative sessions	Quarterly	Agriculture department, irrigation departments	Annual Reports
Develop AJK Land Use Policies to protect land use planning and zoning of agricultural land	Zoning of land carried out	Data not available	Zoning carried out for all land	Zoning maps	Quarterly	EPA, Forest Department	Annual Report
Employ Environmentally sound multi cropping and crop management practices from traditional to high value economic crops	Number of farmers converting to high value crops	Limited data	40% increase	Reports from agriculture departments	Quarterly	Agriculture, irrigation departments	Agriculture statistics reports
Control soil problems such as water logging, salinity, sodicity and soil structure deterioration	Quality of soil	Limited data (district level)	Improvement in soil quality in target districts	Reports from departments	Quarterly	As above	As above
Develop capacity of institutions on remote sensing and GIS techniques to assess temporal changes in land cover of different agro ecological zones	Uptake of GIS techniques in institutions	Limited data	Increased use of GIS in relevant departments across districts	GIS data reports, training reports	Quarterly	As above	As above

CONCLUSION AND WAY FORWARD

A broad range of strategies and programs have been pursued by various governmental and non-governmental entities to address the effects of climate change in AJK province. The development of AJK's Provincial Climate Change Policy reflects the provincial government's commitment to formulating a proactive, coherent, and integrated climate change response that focuses on reducing vulnerability and building the resilience of local communities, infrastructure, environment, and economy. The policy will allow the provincial government to actualize the economic, social, and environmental benefits from promoting climate compatible development in the region. In this vein, the policy and its implementation framework have been informed extensively by stakeholder consultations, comprising of all government departments, civil society organizations, sectoral experts, and the community.

The purpose of the implementation framework, developed through broad-based and inclusive processes, is to facilitate a coordinated, coherent, and effective response to the local challenges and opportunities that climate change presents to AJK province. The framework will help planners and policy makers in AJK to effectively mainstream and integrate climate change considerations into the development planning, budgeting, and implementation processes. It is designed to provide a roadmap for further socio-economic and environmental actions, guide the development and implementation of specific, detailed, and costed climate change interventions that the provincial government and its line departments can pursue in priority sectors over the short and long term time frame.