



Gilgit-Baltistan Environmental Protection Agency (GB-EPA)



# Gilgit-Baltistan

Climate Change Adaptation Action Plan

2022

Gilgit-Baltistan Climate Change Adaptation Action Plan - 2022

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## Abbreviations and Acronyms

CITES	United Nations Convention on International Trade of Endangered Species
CMS	United Nations Convention on Migratory Species (Ramsar Convention)
CPEC	China- Pakistan Economic Corridor
G-B	Gilgit- Baltistan
GIS	Geographic Information Systems
GLOF	Glacial Lake Outburst Floods
MEAs	Multilateral Environmental Agreements
NAP	National Adaptation Plan
NDC	Nationally Determined Contributions under Paris Agreement on Climate Change
NDE	National Designated Entity
NDMA	National Disaster Management Authority
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RS	Remote Sensing
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change

## Preface

The diverse geographic location placement and demographics of Pakistan makes it one of the most vulnerable countries to climatic changes. Gilgit-Baltistan is hit hard by fluctuating climatic patterns because of its ecological fragility and diverse topography. This region hosts the highest mountain peaks, an extended glacial system, pristine valleys, and unique culture which make it exposed to such climatic changes.

In addition to its geopolitical and geographical significance, the region is of particular ecological and economic importance due to its significance as a 'water tower'. The glacial melt feeds the extensive river system in Pakistan which provides river flows to millions downstream and as a lifeline to sustain agriculture and livelihoods. Gilgit-Baltistan also abodes diverse and productive ecosystems that provide timber, and other ecological benefits, and mountain products.

Besides major climatic changes such as temperature rise, water scarcity, damage to agriculture production and degradation of ecosystems, some other unique impacts are observed in the form of glacial melt and the phenomenon of Glacial Lake Outburst Floods (GLOFs). The ongoing China-Pakistan Economic Corridor (CPEC) brings additional trade and commercialization challenges for the region.

Addressing the climate change challenges, through prioritizing adaptation measures is a top political and administrative priority, as to safeguard the unique natural assets and protect the lives and livelihoods of millions in Gilgit-Baltistan. The National Climate Change Policy of Pakistan (2012), the Framework for Implementation on National Climate Change Policy (2013) provide sufficient policy provision for initiating priority adaption actions in the region.

Under the guidance of the Gilgit-Baltistan Climate Change Strategy and with the support of GLOF-II Project, the Gilgit-Baltistan Climate Change Adaption Action Plan is developed through a mutual consultative process and defines Thematic Priority Areas to initiate climate adaption actions and elaborates various strategic objects under the same. It is expected that implementation of the Action Plan would help to reduce vulnerabilities and support adaptation efforts in Gilgit-Baltistan.



## Climate Change Adaptation Action Plan for Gilgit-Baltistan

### THEMATIC PRIORITY 1: STRENGTHENING THE PAKISTAN'S CLIMATE CHANGE DIPLOMATIC STANCE

**Objective 1.1. To facilitate effective involvement from Gilgit-Baltistan in international climate change negotiations process, in-line with Pakistan's diplomatic priorities on climate Change**

**Strategic Actions:**

- 1.1.1. Participate in preparatory meetings of Pakistani delegation, participating in UNFCCC negotiation process to highlight unique vulnerabilities of Gilgit-Baltistan region,
- 1.1.2. Support alignment of Gilgit-Baltistan's climate change priority strategic actions with national priorities for effective projection in global climate change regime, by providing input and support in preparation of 'sector specific' strategic papers relevant to Gilgit- Baltistan,
- 1.1.3. Enhance engagement with other multi-lateral environmental agreements (MEAs), as necessary, particularly, UN Convention to Combat Desertification (UNCCD), UN Convention on Biodiversity (UNCBD), Convention on Wetlands (Ramsar), Convention on Migratory Species (CMS) and Convention for International Trade of Endangered Species (CITIES)

**Objective 1.2. To strengthen vertical institutional coordination for climate change adaptation action**

**Strategic Actions:**

- 1.2.1. Strengthen engagement with Ministry of Climate Change for participation in policy development/ review, adaptation planning and other institutional processes.
- 1.2.2. Enhance coordination with National Designated Entity (NDE) for climate change, i.e., Ministry of Climate Change to effectively engage with reporting process to the United Nations Framework Convention on Climate Change (UNFCCC) as obligatory for Pakistan.
- 1.2.3. Enhance coordination with National Disaster Management Authority (NDMA) for reducing risks and vulnerabilities, particularly the poor and marginalized groups, and by effectively responding to and recovering from all types of disasters events in Gilgit-Baltistan'.

## THEMATIC PRIORITY 2: POLICY INTERVENTIONS AND INSTITUTIONAL STRENGTHENING

### Objective 2.1. Development planning & effective implementation of recommended Policy interventions

#### Strategic Actions:

- 2.1.1. Support Ministry of Climate Change by participating in policy processes, including; development and periodic review of:
  - a. Pakistan's National Climate Change Policy,
  - b. Framework for Implementation of National Climate Change Policy (2014-2030),
  - c. Pakistan's successive Nationally Determined Contributions (NDCs) to United Nations Framework Convention on Climate Change (UNFCCC),
  - d. National Adaptation Plan,
  - e. Development of other sectoral adaptation action plans, i.e., Gender Adaptation Action Plan.
- 2.1.2. Conduct periodic review of progress made with respect to suggested/ identified adaptation measures as defined under the Framework for Implementation of National Climate Change Policy (2014-2030) for Gilgit-Baltistan,
- 2.1.3. Effectively engage National Adaptation Planning process in Pakistan, as a means of identifying medium and long-term adaptation needs; developing and implementing strategies and programs to address those needs for Gilgit-Baltistan,
- 2.1.4. Support development and implementation of 'Gender and Climate Action Plan' of Pakistan with integration of key considerations from Gilgit-Baltistan,
- 2.1.5. Strengthen the Environment and Strategic Assessment of all development projects to integrate adaptation concerns in Gilgit-Baltistan,
- 2.1.6. Support mainstreaming of climate change adaptation priorities in overall development planning in Gilgit-Baltistan, (e.g. mainstreaming management of GLOFs),
- 2.1.7. Ensure effective participation of youth, civil society, poor & marginalized social groups in overall strategic and policy planning in Gilgit-Baltistan by adopting 'whole of society approach',
- 2.1.8. Periodic review and upgradation of Gilgit-Baltistan Adaptation Action Plan,



**Objective 2.2. Institutional strengthening, developing capacities and improved coordination in Gilgit- Baltistan**

**Strategic Actions:**

- 2.2.1. Strengthening of institutional setups in the relevant departments in Gilgit-Baltistan for providing policy and technical support, on matters pertaining to climate change and disaster risk reduction,
- 2.2.2. Institutional strengthening of Gilgit-Baltistan Environmental Protection Agency to perform a lead role in climate change adaptation efforts,
- 2.2.3. Establish and further strengthening institutional coordination mechanism amongst various provincial departments for devising a holistic and coordinated strategic response to climate change by adopting 'whole of government approach', through establishment of 'Gilgit-Baltistan Climate Change Adaptation & Disaster Risk Reduction Committee',
- 2.2.4. Strengthen access to Climate Finance by enhancing institutional capacities, strengthening linkages and improved coordination,
- 2.2.5. Ensure provision of adequate human and financial resources for climate change adaptation action,
- 2.2.6. Strengthen environmental compliance and auditing, through strengthening of impact assessment, quality monitoring and compliance with environmental quality standards,
- 2.2.7. Initiate measures/ design and implement programs to strengthen the capacity of civil society, grass-root organizations and communities for implementation of adaptation measures, increase adaptive capacity and disaster risk reduction, through participatory approaches.

**THEMATIC PRIORITY 3: ADAPTATION INTERVENTIONS DESIGNED AND IMPLEMENTED**

**Objective 3.1. Design and implement adaptation interventions in Water Sector in Gilgit-Baltistan**

**Strategic Actions:**

- 3.1.1. Prepare Integrated Water Resource Management Strategy for Gilgit-Baltistan.

- 3.1.2. Develop and promote integrated water resource management approaches for domestic, agriculture, power, and industrial/ commercial uses.
- 3.1.3. Design, test, introduce and replicate measures (including technological/ mechanical and knowledge-based approaches) for efficient and judicious use of water resources, for domestic, agricultural and industrial use, including:
  - a. Promote access to water by development, extension and rehabilitation of water distribution systems, including piping, water channels/ aqua ducts, and other measures as needed
  - b. Introduce measures to reduce water wastage including, promotion of domestic/ traditional practices, technological options and deployment of fiscal measures (water pricing), with pro-poor fiscal measures,
  - c. Introduce and extend practices to encourage water recycling, i.e., 'waste water treatment and re-use' by adoption cost-effective and sustainable biotechnological (bioremediation) and mechanical options (as feasible)
  - d. Encourage rain-water harvesting for domestic/ agricultural use and ground-water recharge (where feasible)
  - e. Where feasible, promote community water storage practices for domestic, agricultural and livestock use
  - f. Introduce and extend measures for water resource conservation, including, pollution control and quality monitoring for promotion of safe and sustainable use of water
  - g. Consider options for 'ground water recharge' (as and where feasible)
  - h. Design and implement measures for improved access to safe drinking water through better management, while integrating 'pro-poor' considerations
- 3.1.4. Promote policy, institutional, legal and social measures for improved access, judicious and equitable benefit sharing from water resources in Gilgit-Baltistan.

**Objective 3.2. Design and implement adaptation interventions in Agriculture/ Horticulture, Livestock/Rangelands and Fisheries Sectors in Gilgit-Baltistan**

**Strategic Actions:**

- 3.2.1. Prepare 'Integrated Climate- Resilient Agriculture, Horticulture, Livestock, Rangelands and Fisheries Development Strategies' for Gilgit- Baltistan.
- 3.2.2. Document, review, promote and up-scale traditional knowledge with respect to sustainable agriculture, including; agronomic practices, irrigation, storage and crop protection and sustainable harvesting.
- 3.2.3. Preserve, reintroduce/ promote local agricultural and local fruit varieties.
- 3.2.4. Shifting cropping patterns (calendar of agricultural and horticultural operations) towards climatically sensitive methods.
- 3.2.5. Encourage crop diversification towards high-value crops and fruits and promotion of Agroforestry and mixed cropping (where feasible).
- 3.2.6. Introduction of climate resilient crop varieties (drought and heat tolerant, salt resistant).
- 3.2.7. Promote integrated pest management, through promotion of sustainable use of pesticides, their gradual elimination and promotion of biological control of pests.
- 3.2.8. Promote and adopt measures to manage agricultural/ horticulture labor migration through measures to diversify livelihoods.
- 3.2.9. Promote sustainable rangelands management, through deploying 'community-based management' approaches.
- 3.2.10. Introduce and extend soil conservation & watershed management interventions to enhance productivity of rangelands and introduction of alternate fodder production systems.
- 3.2.11. Introduce programs/ initiatives for livestock breed improvement, preservation of local gene pool and improvement of livestock health.
- 3.2.12. Reduce external stressors on aquatic systems (pollution control) for protection of fish resources.
- 3.2.13. Identify and protect hotspot areas for protection of fisheries stocks in Gilgit-Baltistan.

- 3.2.14. Enforce monitoring, regulate fishing and control illegal fishing practices.
- 3.2.15. Promote sustainable fish farming practices to reduce the burden of natural stocks, ensure food security and enhance livelihoods.

**Objective 3.3. Design and implement adaptation interventions in Land use/ Forestry and Ecosystems Sector in Gilgit- Baltistan**

**Strategic Actions:**

- 3.3.1. Conduct land use zoning to identify specific land-uses and facilitate integrated land-use planning and management in Gilgit-Baltistan,
- 3.3.2. Focus on mass afforestation/ reforestation for rehabilitation and expansion of natural forest ecosystems,
- 3.3.3. Promote watershed management for soil protection and ground water recharge (where feasible),
- 3.3.4. Initiate measures for introduction of 'natural capital accounting', for calculating stocks and flows of natural resources and services,
- 3.3.5. Strengthen forest inventory management and monitoring to protect forest resources,
- 3.3.6. Enhance benefit from globally available instruments of Reducing Emissions for Deforestation & Forest Degradation (REDD/ REDD+),
- 3.3.7. Enhance, extend and promote management of protected areas system for biodiversity conservation/ wildlife habitats, ecosystem services, carbon stock development, sustainable tourism and enhance livelihoods,
- 3.3.8. Promote sustainable practices to harvest ecosystem products for fuelwood, timber and non-timber forest products (and other ecosystem services) for forest conservation, increased revenue and livelihood development,
- 3.3.9. Promote use of renewable energy sources (solar, mini & micro hydropower) as feasible for adaptation benefits linked to natural resource conservation, and other associated benefits, such as human health etc.,
- 3.3.10. Empower communities for participation in community-based forest management, better use of indigenous knowledge for forest management,
- 3.3.11. Promote urban greening including forestry interventions, roof top greening as a mean to promote greening and reduce urban heat island effect in cities such as Gilgit and Skardu, and promote other associated benefits,

- 3.3.12. Promote sustainable eco-tourism as a means for promoting nature-based livelihoods in Gilgit-Baltistan,
- 3.3.13. Design, deploy and up-scale 'nature-based adaption' to climate change, for benefits including, biodiversity conservation, land resources conservation/ watershed management, disaster risk reduction and promotion of eco-system services,

**Objective 3.4. Design and implement adaptation interventions in Disaster Sector in Gilgit- Baltistan**

**Strategic Actions:**

- 3.4.1. Conduct 'hazard and vulnerability zonation' of Gilgit-Baltistan region for risk identification and supporting risk mitigation and strengthening response measures,
- 3.4.2. Design and initiate (pilot) measures for financial and livelihood protection of vulnerable communities, such as cash flows, crop and infrastructure insurances, etc.
- 3.4.3. Make use of technological/ engineering and biological measures for disaster risk reduction such as river bank reinforcements, soil stabilization structures, measures for protection of residential and communication infrastructure, etc.,
- 3.4.4. Strengthen early warning system for disaster risk reduction of disaster such as, floods, droughts, heat waves, glacial lake outburst floods (GLOFs'), pest attacks, pandemics etc., with a focus on 'science-based community driven' early warning systems,
- 3.4.5. Development of comprehensive plans (including institutional responsibilities) for safeguarding human lives and protection of livestock, infrastructure and ecological resources from disasters, particularly such as GLOFs',
- 3.4.6. Strengthen response, rescue operations particularly considering climate-induced disasters,
- 3.4.7. Develop and implement livelihoods rehabilitation programs (post disaster), where required,
- 3.4.8. Strengthen technological support for early warning systems particularly in case of disasters like floods and GLOFS,
- 3.4.9. Document, analyze/ interpret, strengthen and re-introduce traditional knowledge for disaster risk reduction and response to disasters, like GLOFS, etc.
- 3.4.10. Promote nature/eco-based adaption for disaster risk reduction in Gilgit-Baltistan,

- 3.4.11. Strengthen response and contingent measures for disaster response, particularly; GLOFs and pandemics,

**Objective 3.5. Design and implement Adaptation interventions in Buildings, Infrastructure and Urban Sector in Gilgit-Baltistan**

**Strategic Actions:**

- 3.5.1. Develop new (existing), revise and amend building codes and infrastructure by-laws for promoting climatically compatible and resilient building and infrastructure development/ introduction of 'zoning building codes',
- 3.5.2. Design and develop climatically smart, environmentally suitable and energy efficient buildings and other infrastructure/ introduce design and material standards,
- 3.5.3. Strengthen city and urban & land-use planning/ village land-use planning for improved disaster resilience, like in case of GLOFs,
- 3.5.4. Initiate measures for upgradation of public buildings, schools, hospitals, power infrastructure (dams, transmission lines etc.) and communication infrastructure (road and communication network) in terms of safety and resilience,
- 3.5.5. Enforcement/ improved regulation of construction and development in highly prone areas to disasters, like:
- a. Riverbeds,
  - b. Unstable topographic location,
  - c. Areas prone to GLOFs,
- 3.5.6. Document, review, promote and up-scale traditional knowledge with respect to infrastructure resilience, particularly rural housing, including:
- a. Use of local/ ecologically friendly and climate resilient construction material,
  - b. Promoting hybrid (encompassing both structural and nature-based) solutions for infrastructure development,
- 3.5.7. Strengthen and extend measures for improvement of air quality (including indoor air quality), by;
- a. Improvement of vehicular engines and fuel quality,
  - b. Air quality monitoring and law enforcement,
  - c. Introduction and promotion of efficient stoves/ cooking and provision of safe fuels for domestic use,

- 3.5.8. Initiate measures for greening of trade and development in Gilgit-Baltistan region, by strengthening policy, institutional/ regulatory and other measures to green the China-Pakistan Economic Corridor (CPEC).

**Objective 3.6. Design and implement adaptation interventions in Health & Sanitation Sector in Gilgit- Baltistan**

**Strategic Actions:**

- 3.6.1. Strengthen preparedness and institutional response to reduce morbidity and mortality of infectious diseases (vector, water, air and food-borne diseases) and malnutrition attributed to climate change,
- 3.6.2. Strengthen a surveillance system at appropriate levels to monitor risk factors/ behaviors, water and air quality, food safety, vectors, malnutrition and other sensitive diseases and risks,
- 3.6.3. Standard case management for reducing morbidity and preventing mortality due to vector-borne and control of pathogens,
- 3.6.4. Enhancement of epidemiological and entomological surveillance, particularly focusing pandemics,
- 3.6.5. Development and implementation of strategies to facilitate access to health care services for early detection and treatment of infections and manage outbreaks, preferably focusing vulnerable population,
- 3.6.6. Development and adoption of guidelines for water storage and disposal, particularly in urban and peri-urban areas. Efficient enforcement mechanisms need to be adopted to monitor water storage facilities/tanks, ponds etc., for disease outbreaks such as dengue & malaria, etc.
- 3.6.7. Regulating use of chemicals for fogging and fumigation to curtail their adverse impacts,

**THEMATIC PRIORITY 4: STRENGTHENING EVIDENCE, INFORMED DECISION MAKING, ADVOCACY AND KNOWLEDGE MANAGEMENT**

**Objective 4.1. Strengthen climate change research**

**Strategic Actions:**

- 4.1.1. Support scientific evidence on climate change & disasters by strengthening science, analysis and interdisciplinary research, in priority areas entailing;
- a. Multi-hazard vulnerabilities and climate change/ disaster risk assessment, (e.g. preparation of glaciers and glacial lake inventories),

- b. Climate change risk assessments in vulnerable sectors and critical geographic areas,
  - c. Vulnerability assessment/ coping capacity assessments/ hazard mapping,
  - d. Ecological/ natural resource baseline surveys/ resource assessment,
  - e. Social, demographic, topographical and geo- spatial database development,
- 4.1.2. Effective engagement with research institutions and academia to support generation of data and conduction of research on priority sectors for Gilgit- Baltistan,
- 4.1.3. Effective engagement with nodal (federal/ international) research institutions in sectors of water, agriculture/ livestock, disasters, forests, etc, for defining science-based policy and adaptation actions for Gilgit-Baltistan,
- 4.1.4. Development & introduction of academic curricula for primary, secondary and tertiary education on climate change adaptation,

#### **Objective 4.2. Strengthening informed decision making**

##### **Strategic Actions:**

- 4.2.1. Continuously advise Government of Gilgit-Baltistan about emerging threats and immediate adaptation priorities, through input and advise to 'Gilgit- Baltistan Climate Change Adaptation & Disaster Risk Reduction Committee',

#### **Objective 4.3. Awareness raising and advocacy**

##### **Strategic Actions:**

- 4.3.1. Promote development of science & knowledge-based communication material, including, brochures, fact sheets, pamphlets web resources, etc., (as required), for:
- a. Impacts of climate change on frequency & intensity of natural disasters,
  - b. Improve climate & disaster resilience in building/ infrastructure, water, agriculture, forestry/ natural resource and health sectors,
  - c. Participatory approaches in natural resource management for promoting ecosystem approaches to climate adaptation and disaster resilience,



- 4.3.2. Design and undertake awareness raising activities on climate change adaptation and disaster risk reduction, for:
- a. Awareness raising activities for policy makers/ politicians, through targeted campaigns/ policy dialogue,
  - b. Awareness raising activities for public officials/ experts/ government functionaries,
  - c. Awareness raising activities for academia/ youth and school children,
  - d. Awareness raising activities for media (print, digital electronic & web-based),
  - e. Design and execute sensitization activities for communities,
- 4.3.3. Design and undertake specific awareness activities to showcase best adaptation practices in priority sectors and to promote climate-friendly human-behavior & practices,
- 4.3.4. Develop an integrated information system to manage temporal and spatial information on climate change and disaster risk reduction,
- 4.3.5. Modernization of climate change extension services through improved use of technological and communication tools, particularly in relation to climate change induced disasters, such as floods & GLOFS,
- 4.3.6. Effective involvement of media/ journalists to better communicate climate change to advocate public awareness,

**Objective 4.4. Knowledge management:**

**Strategic Actions:**

- 4.4.1. Enhance documentation of climate change related information and disaster events/ showcase best adaptation practices and resilience building approaches,
- 4.4.2. Promote use of scientific tools such as geographic information systems (GIS), Remote Sensing (RS), telemetric, and other data based and technologically supported tools (as available) to integrate climate change adaptation concerns in overall development planning,
- 4.4.3. Support translation of scientific research to define policy actions, development of projects/ programs, and risk

reduction from climate change induced disasters, such as GLOFs,

- 4.4.4. Hold continuous 'cross-sectoral' strategic dialogue in Gilgit-Baltistan (i.e., for sector of agriculture, water, disasters, forestry/ land management & natural resources, wildlife & biodiversity, social sector, public health, etc.) for defining & highlighting adaption priorities of the region.



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