

Climate Change

According to Global Climate Risk Index (2017) Pakistan ranks at 7th position among the most adversely affected countries by Climate Change. Despite having high vulnerability of future climatic changes, Pakistan is still among very low GHG emission emitter countries. However, being a responsible state and part of international community Pakistan is planning to take serious steps for playing an effective role in lowering global GHG emissions.

Realizing the high vulnerability to Climate Change, the government has developed national policy to combat Climate Change and an action plan is being developed to effectively implement Climate Change concerns through sustainable planning. To materialize the efforts regarding protection of Climate Change the government has recently passed “Pakistan Climate Change Act 2017”. The legislation has in turn created Climate Change Fund, Climate Change Council and Climate Change Authority to implement the Climate Change Act.

Projects/Programmes Undertaken During 2016-17

Keeping in view the challenges and distortions caused by global climate change, the worldwide efforts are underway to mitigate the devastating effects. Pakistan, like many other countries, is fully cognizant of this issue and has already undertaken various programs and projects.

Sustainable Land Management Program with UNDP assistance is being implemented at a cost of Rs.105.400 million. For integrated management of land and water resources; measures to rehabilitate degraded rangeland;

measures to improve dry and forest and control shifting sand dunes over an area of 80,000 hectares in 200 villages and creating climate resilience. These interventions are aimed at restoring ecosystem services including carbon sequestration, and will help to support improved and new livelihood opportunities. In this context local community participation in the planning, implementation and monitoring of all such activities would play a crucial role.

Development of reverse linkages between Pakistan Metrological Department (PMD) and Marmara Research Center Turkey is under way which will provide the PMD with enhanced support and capacity building in seismic research and development.

The Prime Minister of Pakistan has approved launching of Green Pakistan Programme – Revival of Forestry Resources aimed to increase the forest cover of the country. Total cost of the programme is Rs.3652.100 million and an amount of Rs.554.000 million has been released during 2016-17.

Future projects and programs for 2017-18

Some of the programmes which will be implemented in future are as follows:

1. Development of reverse linkages with MARMARA Research Center Turkey.
2. Strengthening Capacity for Effective implementation of the Pakistan Trade Control Wild Fauna and Flora Act.
3. Establishment of Climate Change Reporting Unit

4. National Disaster Spatial Data Infrastructure
5. Implementation of Human Resource Development Plan (under consideration)
6. Prime Minister has approved the launching of Green Pakistan Programme aimed to increase the forest cover of the country.
7. Green Pakistan Programme – Revival of Wildlife Resources in Pakistan (Principally approved by CDWP).
8. Strengthening “Zoological Survey of Pakistan” for undertaking immediate inventory of endangered wildlife species and habitats across Pakistan for producing regular status reports on periodic basis
9. Climate Resilient Urban Human Settlements Units.
10. Establishment of Climate Change Reporting Unit
11. Establishment of Pakistan WASH Strategic Planning and Coordination Cell.

Environmental Quality Control Measures

1. Level of suspended particulate matter PM 1.0 and PM 2.5 shall be brought within limits of Ambient Air Quality Standards. Provincial Governments will develop and implement Clean Air Program for their major cities.
2. All industrial facilities shall be well-designed, well installed, efficiently operated and maintained air cleaning devices.
3. Haze and smog formation will be curtailed by tapping sources of ammonia, nitrogen oxides and sulphur oxides emission.
4. Air quality of all major cities shall continuously be monitored and disseminated to general public.
5. The fresh water sources will be categorized and protected against pollution.
6. All major cities will install sewage treatment plants. The treated water will be used for agriculture and horticulture purposes.
7. Cleaner Production techniques will be adopted by industry to minimize pollution generation. Federal and Provincial

Governments will ensure that at least 70 percent industrial wastewater be treated by 2025 before discharge into water bodies.

8. Wastewater Discharge limits shall be imposed on industry to conserve water and reduce pollution load.
9. Provincial Cleaner Production Centers will be established to promote water minimization, recycling and waste exchange.
10. Investment windows and incentive schemes shall be announced to encourage installation of treatment plants.

Impact of environmental degradation

Pakistan’s vulnerability from climate change is due to geographic, demographic and diverse climatic conditions. Particularly the environment changes threats to water, energy and food security due to the inherent arid climate coupled with the high degree of reliance on water from glacier snowmelt. Its impacts are being felt through increasing intensity and frequency of extreme climatic disastrous events, as well as small, but incremental changes insidiously affecting many sectors of government activity. Pakistan’s response to the challenges of global warming and climate change has been closely aligned with its strategies for environmental protection, sustainable development goals (SDGs) and objectives of the Convention on Climate Change.

Adoption of the National Climate Change Policy 2012 provided a comprehensive framework for policy goals and actions towards mainstreaming climate change, especially in economically and socially vulnerable sectors of the country. A follow-up to these policies was the launch of framework for Implementation of the Climate Change Policy (2014-2030), which outlines the vulnerabilities of various sectors to climate change and identifies appropriate adaptation and mitigation measures. The Framework document was developed to serve as a catalyst for mainstreaming climate change concerns into decision making at national and sub-national levels and to create an enabling environment or an integrated climate compatible development process. The

document promotes preparation of the National Adaptation Plan (NAP), Nationally Appropriate Mitigation Actions (NAMAs) to the United Nation Framework Convention on Climate Change (UNFCCC) as well as detailed sub-national adaptation action plans. In order to achieve the objectives of these policy initiatives, the country has considerably improved and strengthened its climate governance structure over time. Climate change and environmental protection have been extensively recognized at national level and specific budgetary allocations have been made at national and sub-national levels for execution of the Framework for Implementation of the Climate Change Policy.

Pakistan's adaption to climate change

Pakistan being highly vulnerable to extreme climate events is into a state of forced adaption. There is a huge potential for adaption in Pakistan, particularly in strengthening and fortifying the flood infrastructure including water reservoirs and water channels. This would involve enhancing reliance of local communities to the adverse impacts of climate change. According to Pakistan's Intended Nationally Determined Contribution report, the adaption need is between US \$ 7 to US \$ 14 billion/ annum.

Climate Public Expenditure and Institutional Review (CPEIR)

CPEIR is a systematic qualitative and quantitative analysis of a country's public expenditures on climate change. It is an innovative tool which reviews the country's climate change plans and policies, institutional framework and public finance architecture to make recommendations to strengthen them. The UNDP has conducted CPEIR in partnership with the government. It is the first effort of its kind in Pakistan to determine the levels of expenditure being made by the government on climate change. The results reveal that the investments made by the government are quite significant, though not sufficient to meet the expanding challenges of climate change. The federal climate-related expenditure is estimated to be 8.5 percent of total national expenditures.

Box-1: Climate Change Act 2017

The parliament passed climate change bills that will take fast-track measures needed to implement actions on the ground in a country that has so far lagged on climate action. Pakistan is among the few countries in the world to adopt legislation on climate change. The new law establishes a policy-making Climate Change Council, along with a Climate Change Authority to prepare and supervise the implementation of projects to help Pakistan adapt to climate impacts .The new bill will help the provinces with adaptation and mitigation strategies and projects.

Adaptation and Mitigation Measures.

Globally environmental related issues are going to play a major role in the social and economic development of countries, especially the underdeveloped ones. Ministry of Climate Change has taken many initiatives in the area of climate change adaption and mitigating in accordance with National policy which are as under:

United Nations Conference of Parties on Climate Change (COP-21)

The 21st Session of the Conference of the Parties (COP-21) to the UN Framework Convention on Climate Change (UNFCCC) was held on 30th November 2015 in Paris where world leaders including Pakistan signed an agreement aimed at stabilizing the climate and avoiding the worst impacts of climate change. The agreement consists of four main areas:

- i. Adoption & Mitigation
- ii. Intended Nationally Determined Contributions (INDCs)
- iii. Technology Development and Transfer
- iv. Capacity Building

The focus was to monitor progress on mitigation pledges in terms of global annual emissions of green house gases by 2020. In continuation to this event, COP-22 was held with the objective to move forward on the implementation of the Paris Agreement.

United Nations Conference of Parties on Climate Change (COP-22)

Conference of Parties (COP22) was a United Nation's (UN) Conference on Climate Change in Marrakech, Morocco held in November, 2016 to put environmental changes into perspective and find solutions. Pakistan delegation for Climate Change also attended the 22nd Session of Conference of Parties (COP-22). The recent actions taken by the government, including the National Climate Change Policy, along with a framework for its implementation, and a National Disaster Risk Reduction Policy has been highlighted. Pakistan has also developed a National Sustainable Development Strategy, and National Assembly has passed a resolution adopting the SDGs agenda as its own national development agenda.

Intended Nationally Determined Contributions (INDCs)

Ministry of Climate Change has developed Pakistan's Intended Nationally Determined Contributions (INDCs) with mitigation and adaptation challenges that it faces and proposes actions that can assist in addressing these challenges through both domestic and international support.

HABITAT-III Conference.

Ministry of Climate Change has developed national report for HABITAT-III Conference. The report reviews the implementation of Habitat-II agenda and other relevant internationally agreed goals and targets as well as new challenges, emerging trends and a prospective vision for sustainable human settlements and urban development.

Climate Change Vulnerability Assessment of Islamabad

UN Habitat, Capital Development Authority and ICT Administration jointly working with Ministry of Climate Change have undertaken a study "Climate Change Vulnerability Assessment of Islamabad" which was launched in 2015. The main findings of the assessment reveal startling facts regarding erratic behavior and marked changes in the intensity, frequency

and variability of temperature, precipitation, floods, draughts, cyclones etc. The study proposes a well thought out planning interventions to make Islamabad a climate resilient city. The study also makes recommendations of utilizing the present institutional arrangements for a well-coordinated effective implementation of suggested plans in Islamabad.

Technology Needs Assessment (TNA)

Ministry of Climate Change is carrying out Technology Needs Assessment (TNA) with the help of Climate Technology Centre and Network (CTCN). The objective of the activity is to enable Pakistan to conduct TNA process and produce implementable Technology Action Plans (TAP) in line with current best practices.

Sustainable Consumption and Production (SCP)

Ministry of Climate Change in collaboration with United Nations Environment Program (UNEP) has initiated a program in Pakistan on Sustainable Consumption and Production (SCP) titled "Strengthening Pakistan's National Policy Frameworks to Facilitate Resource Efficiency and Sustainable Consumption and Production." The aim of the program is to provide support in creating and strengthening enabling environments for resource efficiency and SCP National Action Plan covering the Sustainable Development Goals (SDGs) and its linkages with Climate Change.

The government has started work on the Preparation of Second National Communication (SNC) report on Green House Gases (GHG) emissions. This will be a three year study leading to stocktaking of all GHG emissions in country with options of mitigation and adaptation actions.

State of Pakistan Cities

UN-Habitat with the help of Ministry of Climate Change is preparing a State of Pakistan Cities Report. The report will present a well informed and action oriented analysis on the state of urbanization in Pakistan. It will include quantitative and qualitative city-based data and conduct specific analyses of key national,

provincial and municipal urban development challenges on cities and towns in all provinces of Pakistan. The report would be important tool in formulating an urban agenda and policies and for shaping the national development agenda for the coming years.

Activities of Pakistan Environmental Protection Agency (PAK-EPA)

Pakistan Environmental Protection Agency (Pak-EPA) is mandated to enforce the Pakistan Environmental Protection Act 1997 in the Islamabad Capital Territory. The following major activities are being undertaken by Pak-EPA:

Geomatic Center for Climate Change and Sustainable Development Project

Environmentally sustainable development is the foremost concern identified at global level. The government has undertaken several projects and programs to support the environmental goals. Many projects have been completed which includes capacity building, provision of clean drinking water, environmental management, biodiversity, air pollution control and waste management etc. Furthermore, to full fill the growing needs of advance technologies in research and sustainable development in the field of environment, Ministry of Climate Change has launched a project of Establishment of Geomatic Center for Climate Change and Sustainable Development.

Modern technologies, such as Geographic Information System (GIS) and Remote Sensing (RS) allows for rapid documentation of the state of environment in all its manifestations, and is easily available for determining trends on spatial and temporal scales and for taking proper policy measures at all levels. Specific objectives of the centre are as under:

1. Promotion of application of Global Information System (GIS), Spatial Reference System (SRS) and Global Positioning System (GPA) technologies for assessment of existing situation of forest, desertification, soil, climate, environmental pollution, marine life, coastal areas, snow and glacier, - disasters, hazards,

biodiversity, water resources, ecological zones.

2. Better facilitation for environmental planning in the country, particularly for rational and scientific decision-making through assessment of environmental impact of different human activities, making them compatible with the objectives of sustainable development.
3. Provision of a platform equipped with latest information/data, digital and spatial library to national, provincial and local government institutions for framing disaster management frameworks and early warning mechanisms.

NATIONAL BIOSAFETY CENTRE (CARTAGENA PROTOCOL)

Pakistan ratified Cartagena Protocol on March 02, 2009 under which it is obligatory to devise implementation mechanism for regulating Genetically Modified Organisms (GMOs) and their products. The protocol has been implemented by preparing and notifying Bio safety Rules by PEPA. These rules provide legal cover for regulating GMOs. National Bio safety Guidelines were notified in October 2005 for the facilitation of applicants to follow procedures for the implementation of the Bio safety Rules in the country.

The two committees i.e. Technical Advisory Committee (TAC) and National Bio safety Committee (NBC) function for granting licenses under compliance of Cartagena Protocol on bio safety.

Sustainable Land Management (SLM) Program to Combat Desertification

This project will be implemented in 14 dry land districts in four provinces to restore degraded ecosystems, reduce poverty and increase resilience to climate change. The main objectives of the program are to up-scale climate resilient SLM activities across a larger landscape to combat land degradation and desertification and to produce enabling environment at national provincial and local levels to support up scaling of SLM practice

Box-2: Green Pakistan Program

Pakistan is one of the low forest cover countries with only 5 percent of land area under forest and tree cover whereas international requirement is 25 percent. To increase the forest coverage the government has launched, the Green Pakistan Program with the main objective to facilitate transition towards environmentally resilient Pakistan by main streaming notions of adaptation and enabling policy environment. The objectives of the program will be achieved by implementing different initiatives and projects. It has two major projects.

Green Pakistan Program-Revival of Forestry Resources in Pakistan

The estimated cost of this project is Rs. 3.652 billion and will be implemented over a period of five years (2017-2021) to achieve the following objectives

- a. One hundred million new indigenous plants including 20 percent fruits plants will make the country green and serene as under:
 - One thousand avenue miles of canal/road side plantation in Punjab, Khyber Pakhtunkhwa and Sindh
 - Olive and Kikar Phulai forests in Kala Chitta, Pabbi Rasul and Fort Monroe scrub forest of Punjab
 - Dry temperature forest in FATA
 - Guzara forest in Murree/Kotli Sattian and Hazara and protected forests of Malakand region in KPK.
 - Mangrove forests in Karachi and Badin along with scrub hill forests of Khirthar range in Sindh
 - Juniper forests of Ziarat and Chilghoza forest in Suleiman range of Balochistan
 - Watershed and soil conservation plantation and operations in Gilgit-Baltistan and AJK moist tropical forest areas.
 - Historic Irrigated Plantation of Changa Manga, Daphar, Bahawalpur and Chichawatni.

- b. Strengthening policy measures for conservation of biodiversity
 - Approval and implementation of National Biodiversity Strategy and Action Plan
 - Establish strategic support units at national and provincial level to ensure smooth implementation of ongoing green initiatives and plan future activities on sustainable basis
- c. Supporting communication measures and demand mobilization for an environmentally resilient Pakistan
 - Projection of best practices of Green Pakistan Program through media and international forums.
 - Capacity building of provincial forestry and wildlife departments to support afforestation, awareness campaigns and human resource development for sound natural management and biodiversity promotion.

Green Pakistan Program - Revival of Wildlife Resources in Pakistan

The estimated cost of this project is Rs.1.065 billion and will be implemented in five years (2017-2021). The main objective of this program is to revive and functionally recognize wildlife departments at provincial/AJK and GB level through development of time bound plans including capacity building and incentive driven performance regime.

Conclusion

Climate Change is a serious global threat and continued mitigating efforts are underway both at national and international level. Pakistan is one of the affectees of climate change problem and has been ranked 7th position among the most adversely affected countries. Climate Change has posed three big challenges relating to the water, food and energy security of the country. Other adverse effects of Climate Change include extreme temperatures, seasonal droughts, heavy rains, monsoonal storms/cyclones, devastating floods, unusual fogs, melting of glaciers, landslides and avalanches

in the mountain areas and threatening inflows into Indus River System (IRS).

The government is cognizant of these issue and taking strategic adaptation measures at policy and operational levels to minimize the global warming effects and to ensure food, energy and water security. Further efforts to overcome the

challenges of Climate Change are made through enacting legislation, setting standards, developing and implementing policies for a secure and lively environment. The existing and proposed measures being taken by the government would help the country to address the Climate Change issues effectively.
