



Environment

The major environmental challenge of today's world is the unprecedented climate change. Globally climate change is creating immense problems for the humans and wildlife. Steady rise in temperature is due to greenhouse gases produced by human activities. Strong impacts of climate change like devastating storms, hurricanes and severe heat waves could be life threatening in small countries with limited resources. The Inter Governmental Panel on Climate Change (IPCC), which includes more than 1,300 scientists from the United States and other countries, forecasts a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century.

The world is realizing the prospect of a global scale disaster due to abrupt changes in the global climate. Industrialized countries like China and USA are major consumers of the Earth's resources and also leading emitters of greenhouse gases. However, these countries along with other developed countries have acknowledged the importance of climate change and contributing considerably to mitigate these effects through promotion of renewable energy.

Pakistan like many other countries is also facing environmental challenges. It is located in a warm climate region and is more vulnerable to expected climate changes due to its diverse topographic and demographic settings. The temperature changes under current circumstances are expected to be higher in Pakistan in long run than global averages. The country is affected by the drastic effects of climate change due to its geographical location and socio-economic situation. In the recent years highly variable monsoon rains and severe climatic events such as floods and droughts have affected the socio-economic structure of the country. The extreme conditions of the weather in Pakistan like the floods in 2010, 2011, 2013 and 2015 have considerably effected not only the agriculture sector but also damaged infrastructure

at large scale. Other issues being faced by the country due to climate change include water pollution, desertification, soil erosion, water logging and salinity, solid waste management and deforestation.

The government is cognizant of these issues and committed to mitigate the negative effects of climate change. Some of the immediate actions taken by the government include biodiversity conservation and National Disaster Management Plan. Being signatory to National Conservation Strategy and Convention on Biodiversity (CBD), the government has developed Biodiversity Action Plan which is the most significant step in addressing the biodiversity loss in the country. To minimize effects of natural disasters, the government has introduced 10 years National Disaster Management Plan (NDMP). The institutional capacity building is being enhanced to combat disasters in first phase of this plan. In second phase, the activities and plans shall be implemented in the priority areas, whereas phase three will be dedicated to develop the capacity of local government and dissemination of the disaster activities throughout the nation. Further, the surveillance and forecasting capacity of Pakistan Metrological Department is being enhanced by installing more weather surveillance Radars at various location of the country.

Projects/ Programmes Undertaken during 2014-16

The government has undertaken several projects and programmes to support the environmental goals. Many projects have been completed such as capacity building, provision of clean drinking water, environmental management, biodiversity, air pollution control and watershed management, urban development, promotion of tourism, restoration of lakes and water bodies, environmental awareness, waste management, and

wetlands management, etc. One of the major issues which are being faced in the country is desertification and land degradation. To combat desertification and land degradation, the government started an umbrella project with the assistance of UNDP. First phase of this project has been completed and targets such as institutional and knowledge capacity building, feasibility studies for testing Sustainable Land Management (SLM) practices and designing full demonstration investments, has been achieved. Second phase of this project is also under implementation in 14 districts of Pakistan with approved cost of Rs.1666.67 million.

The government is also working with several NGOs, INGOs and United Nations Organizations, such as Leads, WWF, IUCN and UNEP on environmental issues and has implemented projects in capacity building on climate change adaptation, environment rehabilitation, mountain area and wet areas conservancy and provision of clean drinking water. As a result, Pakistan has been successful in achieving the targets set under MDG 7 (Ensure Environmental Sustainability). Target of conversion of 0.92 million vehicles on the Compressed Natural Gas (CNG) has been achieved. Target of access to improved water resources through hand pump, electronic motor and tap water has also been achieved. Progress is on track to meet the target for land protection for the conservation of wildlife as a percentage of total land area. However, Pakistan's performance on other targets such as forest cover and lowering the Sulphur content in high speed diesel as well as access to sanitation and energy efficiency by the proportion of population is not remarkable and is behind in achieving these targets compared to its regional counterparts. Ministry of Climate Change has taken many initiatives to increase the awareness and to change the attitude of people regarding environmental issues as well as strict compliance of government regulations to achieve environmental sustainability targets. The following steps have been undertaken at federal level.

- ▶ Signing of Paris Agreement on 22nd April 2016.

- ▶ Establishment of a Climate Change Council, Climate Change Authority, Climate Change Fund and Task Force On Climate Change
- ▶ Climate Public Expenditure and Institutional Review Study is being expanded to ascertain the amount of expenditure on climate change.
- ▶ Technology Need Assessment under CTCN has been initiated.

Future Projects/Programmes

The government has focused on provision of productive and healthy natural resources. There is gradual improvement in air and water quality, institutional strengthening, and taking up sustainable development across different sub-sectors of the economy and to achieve these objectives, the following actions will be taken:

- ▶ Transformation of existing environmental policies into practice by implementing a programme based approach and to identify gaps and issues, activities and action plan as well as strategies to overcome the environmental issues.
- ▶ Management of ecosystem with the special emphasis on imperative ecosystem segments such as protection of biodiversity, water conservation and soil erosion protection, carbon sequestration and biodiversity protection, etc.
- ▶ Despite having the potential and capacity of our industry for designing and fabricating waste water and sewage treatment plants locally still a meager portion of industrial waste water is being treated and reused. Therefore, to treat and recycle industrial effluents, a Wastewater Treatment Programme will be initiated in the country in collaboration with the provincial governments.
- ▶ Draft of 'Forest Policy 2015' has been prepared by Ministry Of Climate Change. This policy will provide a legal basis for the government to extend support to all federating units towards achieving their targets and meeting international obligations by filling their capacity and financial gaps.

- ▶ Implementation of GEF-funded mega project on Sustainable Forest management.
- ▶ To set up implementation mechanism for the provisions of Nagoya Protocol and ABS legislation with the consultation of provinces.
- ▶ Implementation of NBSAP with the help of provinces
- ▶ Furnishing national communication reports to Conventions and Protocols (CBD, UNCCD, CITES, CMS, Ramsar, Cartagena Protocol on Bio-safety, Nagoya Protocol).
- ▶ Forestry & Biodiversity
 - Forest management
 - Habitat conservation
 - Community participation
- ▶ Disaster Preparedness
 - Forecasting and warning system
 - Preparedness
 - Management
 - Recovery and rehabilitation

Mitigation strategies

Need for mitigation/adaptation measures to counter negative impacts of climate change

Despite being a low GHG emitter (<1 percent of global emissions¹), Pakistan is bearing the brunt of climate change related disasters at a high cost to its economy. This situation requires concerted efforts to adapt to the adverse impacts of climate change and relatively fewer efforts to carry out mitigation measures. A number of measures needed to be taken to address both mitigation and adaptation aspects of climate change through enhancing various ongoing efforts and initiating new activities detailed below:

Adaptation strategies

Adaptation is particularly important as it will provide quicker solution to vulnerable communities. Some of the planned measures include:

- ▶ Water Resources
 - Water conservation strategies
 - Water management
 - Capacity building
- ▶ Agriculture and Livestock
 - Technology
 - Resource management
 - Genetic modification
- ▶ Human Health
 - Monitoring and forecasting of outbreak
 - Plans and policies
 - Training and capacity building
 - Resource management

¹ Per capita

Pakistan’s GHG emissions are bound to increase considerably as the country climbs up the development ladder and strives to provide adequate amount of energy to support its growing socio-economic developmental requirements. As a responsible member of international community, Pakistan would like to contribute to the global GHG mitigation efforts without compromising on its basic minimum energy and food needs consistent with its socio-economic developmental requirements, energy security considerations, as well as financial and technological constraints.

1. Air

Growth in the industrial zones brings prosperity, but on the other hand raises the smoke particulate matter and the effluents which have a damaging effect on the environment. China which has gone on rapid industrialization and developed industrial parks is suffering from the industrial pollution. The pollution level in cities like Shanghai and Beijing has been a shock to the heavily industrialized China. Similar is the case with Pakistan where rapid rise of urbanization and industrialization has created serious concerns of environmental degradation. Major cities of Pakistan; like Karachi and Lahore have already been termed as among the most polluted cities in Asia. The continuous fog and smog conditions in Lahore and other areas of Punjab in the winter months, with delayed rainfall, is a worrisome factor.

To overcome these issues present government has introduced the rapid, safe and modern mass transit system in major cities to make the mobility easier which will be also helpful in reducing the pollution. The busses under metro projects are

newer and have the diminishing effects on the air pollution while providing better transportation services to the masses. This facility has been provided only in three cities (Lahore, Rawalpindi and Islamabad) and therefore, has marginal impact on the environment and expansion of this service may have far reaching positive effects on air pollution

Pakistan needs to carry out extensive research in the field of air quality. Constant and dynamic monitoring of pollutants levels such as PM, PM10, SO₂, CO, CO₂, O₃, NO₂, hydrocarbons (methane and non-methane), lead (Pb) and noise should be carried out in all the major cities and towns of the country. An efficient network of data sites has to be developed which can churn out correct and useable data on regular basis. Many departments and institutes are working in this sector but most of their efforts are focused on a single pollutant of a specific area. Air quality management system may be established to address the situation with following goals. Identify relevant legislative and regulatory requirements;

- ▶ Identify all sources of air pollution caused by human activities;
- ▶ Set appropriate objectives and targets for human and environmental health;
- ▶ Set priorities for achieving objectives and targets;
- ▶ Establish a structure and programmes to implement policies and achieve objectives and targets;
- ▶ Facilitate the monitoring of air quality and effects on human health and environment;
- ▶ Facilitate urban planning, corrective action and the prevention of adverse effects;
- ▶ Ensure compliance with emission and air quality standards.

Water

Water is the key component in determining the quality of our lives. Now a day, people are concerned about the quality of the water they drink. The stress on water resources of the country is from multiple sources. Rapid urbanization, increased industrial activity and dependence of the

agricultural sector on chemicals and fertilizers have led to water pollution. According to Pakistan Council of Research in Water Resources (PCRWR), the majority of the population in the country is exposed to the hazards of drinking unsafe and polluted water from both surface and ground water sources. As derived from the National Water Quality Monitoring Programme carried out by the PCRWR, the 4 major contaminants in drinking water sources of Pakistan were bacteriological (68 percent), arsenic (24 percent), nitrate (13 percent) and fluoride (5 percent). It is estimated that around 40 percent of all reported diseases in Pakistan are attributed to poor water quality. As one indicator of the magnitude of the problem, it is estimated that 250,000 children in Pakistan die every year due to diarrheal diseases alone. Safe water alone can reduce diarrhea and other related diseases by up to 50 percent, but an estimated 62 percent of Pakistan's urban population and 84 percent of the rural population do not treat their water (USAID). Pakistan's ranking in maintaining water quality standards is 80th out of 122 nations. (UNESCO s' World Water Development Report)

About 2 million wet tons of human excreta are annually produced in the urban sector of which around 50 percent go on to pollute water bodies. The National Conservation Strategy states that almost 40 percent of all disease related deaths are connected to water borne diseases. Other sources of water pollution are industrial effluents, solid waste, hospital waste, chemical fertilizers and pesticides.

According to an estimate (Monitoring Report of PCRWR), in Pakistan water related diseases cause annual national income losses of US\$380 to 883 millions of GDP. In this perspective, it is the demand of time to take initiatives to ensure that drinking water is as free of such impurities as is possible and this can be accomplished by timely monitoring and treatment of drinking water quality.

To address this issue of national importance the federal government, through Pakistan Council of Research in Water Resources (PCRWR) has implemented several National Water Quality Monitoring and Surveillance activities such as

The National Water Quality Monitoring Programme (NWQMP). The outcome of all five phases of NWQMP has led to the realization that the federal, Provincial and local governments need to take immediate initiatives for the provision of safe drinking water to the public in order to prevent the onslaught of water borne diseases. Advocacy efforts for the awareness and education of the general public, regarding the water quality testing and treatment are also required.

Further, the natural presence of arsenic and other toxins in groundwater, the most common source of drinking water, is considered a worldwide public-health crisis and an unprecedented natural disaster. Thirty-five countries around the world have reported arsenic contamination problem in ground water. The ground water pollution caused by arsenic in South Asian countries especially India and Bangladesh has led to major environmental crisis of arsenic poisoning. PCRWR is also doing arsenic monitoring test in the country. In Pakistan, the intensity of arsenic contamination in ground water is comparatively lower. The concentration of arsenic in groundwater of several districts of Punjab and Sindh provinces has been observed through different water quality studies conducted by PCRWR.

Solid Waste Management

Solid waste can be defined as material that no longer has any value to the person who is responsible for it, and is not intended to be discharged through a pipe. In Pakistan the absence of a proper solid waste disposal system and huge amount of uncollected wastes poses great threat to the public health as they are the source of mosquitoes and flies which transmit malaria and cholera. One of a very hazardous and un-noticed drawback of the waste disposal in Pakistan is that hospital and industrial waste is treated as ordinary waste. Only 50 percent of solid waste quantities generated are collected by government services. Increase in the solid waste is due to increase in urban population, industrialization, changing consumption pattern and also affluent life style. Because of lack of adequate disposal sites, much of the collected waste finds its way in dumping grounds, open pits, ponds, rivers and agricultural

lands. Solid waste management position in rural areas is more devastating where mostly open dumping is carried out.

The estimated quantity of solid waste generation in Pakistan ranges between 0.283 to 0.612 kg / capita / day and waste generation growth rate is 2.4 percent per year. Due to poor solid waste management there are large number of communicable diseases and unhygienic environment being created.

The recommendations that can be considered for the improvement of the current situation regarding solid waste management in Pakistan includes, raising awareness about consequences caused by solid waste pollution. The collective efforts of government sectors, NGOs and private sector for solid waste management and legislation should be done which would be effective and find ways to implement it effectively application of 3R's (Reduce, Recycle and Reuse) concept in solid waste management. House to house collection of solid waste should be organized. Littering of solid waste should be prohibited in cities, towns and urban areas. Proper segregation would be vital for scientific disposal of waste. Developing legal framework and national guidelines for solid waste management that includes waste management rules and basic recycling rules can help the country to minimize the hazardous effects of solid waste.

Land

Pakistan is predominantly an arid to semi-arid country with 68 million hectares of land lying in regions where the annual rainfall is less than 300 mm. One-fourth of the country's land area, which is suitable for intensive agriculture, is threatened by wind and water erosion, salinity, water-logging, flooding and loss of organic matter. The important driving forces of land degradation in Pakistan are intensive agriculture, unsustainable cropping pattern, unchecked use of chemical fertilizers and pesticides, limited land resources and population increase. Agriculture is one of the major sectors likely to be adversely affected by climate change in Pakistan. Crop simulation models based studies shows that Wheat yields will be reduced by 3.4 to 12.5 percent in the semi-arid irrigated areas (Faisalabad and Sheikhpura), 3.8 -

14 percent in arid areas (Multan & Bahawalpur, Badin and Hyderabad) and upto 16 percent rainfed (Chakwal) areas under both A2 and B2 scenarios towards the end of 21st century. Similarly in the Basmati rice tract, the yield is expected to be reduced by 10.4 percent, 16.5 percent and 17.8 percent under B2 scenario by 2020s, 2050s and 2080s, respectively. Under A2 scenario, the yield is expected to decline by 11.4 percent, 15.8 percent and 21.5 percent, respectively by 2020s, 2050s and 2080s. In general, an increase in temperature will lead to shortening of Growing Season Length (GSL) for wheat and rice crops in all the selected wheat growing districts and Basmati rice tract of the country. The results suggest that the aggregate impact of climatic parameters i.e., changes in temperature and rainfall exerted an overall negative impact on cereal crop yields, given that the management practices and use of technology remain unchanged². Negative impact of climate change (increase in temperature) has been observed in neighbouring countries like India. In India the reduction in yield of major crops (Rice, Maize and Wheat) per 1 degree Celsius in the temperature is expected to range from 4 percent to 20 percent (rice), 32 percent to 50 percent in case of maize and 5 percent to 20 percent in wheat.

The key issues related to desertification in Pakistan include water erosion, wind erosion, depletion of soil fertility, deforestation, livestock grazing pressure, loss of biodiversity, water-

logging and salinity, drought and flooding and socio-economic constraints. About 11 million hectares are affected by water erosion and 3-5 million hectares by wind erosion. The amount of soil removed by wind is about 28 percent of total soil loss. Due to deforestation, forest cover is shrinking by 3.1percent and woody biomass by 5 percent annually (7000-9000 ha taken away annually). Free grazing of livestock, aridity and prolonged drought in arid lands have affected the biodiversity in various regions. Forests play an important role in the ecological and economic life of a country. Pakistan is one of the lowest forest cover countries with only 5 percent of land area under forest and tree cover. Major forest types include coastal mangroves, reverine forests, sub tropical scrub forests, moist and dry temperate conifer forests and irrigated plantations.

The government is trying to combat the situation and the first phase a comprehensive Sustainable Land Management Programme (SLMP) has been completed and 2nd phase with the total cost of Rs.1666.68 million has been approved and started its activities for selective districts in four provinces of Pakistan. The government has planned to manage all types of forests by the ecosystem approach. This will enable the conservation of forest biodiversity, provide sustainable livelihood to forest dependent communities and contribute to mitigating global environmental problems.

Box-I: Green Pakistan Programme

The Prime Minister has approved the launch of 'Green Pakistan Programme' to improve forestry and wildlife sectors. This programme targets to add 100 million plants over the next five years all over the country. Under The Green Pakistan protection and management of wildlife and reclaiming and developing forest areas are the main aspects of the programme. In this regard relevant federal and provincial ministries and agencies including Fata, GB and AJK will actively participate in this programme to achieve the desired objectives of forests preservation and wildlife protection. This initiative will ensure far-reaching reforms in forestry and wildlife sectors of the country.

Participation in Reducing Emissions from Deforestation and forest Degradation (REDD+)

Under the UN Framework Convention on Climate Change, a new mechanism Reducing Emissions from Deforestation and Forest Degradation (REDD+) has been adopted in Cancun in 2010.

Pakistan has vast potential of controlling deforestation under REDD+ by paying compensation to forest communities with the finance of free market and non market resources. Ministry of Climate Change has constituted a National Steering Committee on REDD+ to guide and steer REDD+ in the country. Pakistan became a member of United Nations REDD+ programme (UN-REDD programme) in 2011 and World

² GCISC Study, 2015(Global change impact studies centre)

Bank's Forest Carbon Partnership facility (FCPF) in 2014. The UN-REDD and FCPF financial mechanisms support developing countries to undertake readiness activities to be eligible result-based payments. World Bank Mission visited Pakistan in December 2015. The FCPF grant for REDD+ readiness is being utilized for the preparation of national REDD+ strategy, national forest monitoring system, and a system of social and environmental safeguards to implement REDD+.

Mass Afforestation and Tree Planting Campaigns

In order to enhance tree coverage in the country, tree planting campaigns are held each year. Two inter-provincial meetings to finalize the targets and strategies for the monsoon and spring tree planting campaigns were held under the chairmanship of Secretary, Ministry of Climate Change. During the tree planting campaigns all the government departments, private organizations, defense organizations and NGOs were involved in planting activities. In last meeting held on July 28, 2015 for the monsoon tree planting campaign a target of 40 million trees was fixed in consultation with provinces and other partners.

Mangroves for the Future (MFF)

The Mangroves for the Future (MFF) initiative focuses on the countries affected by the tsunami. However, MFF also include other countries of the region that face similar issues, with an overall aim to promote an integrated ocean wide approach to coastal zone management. Pakistan joined MFF as dialogue country in 2008 and prepared National Strategy and Action Plan for the Mangroves for the Future. Pakistan has become regular member of MFF in 2010. As a member, Pakistan is entitled to receive reasonable support for institutional strengthening, capacity building and for implementation of small and large projects in coastal areas of Sindh and Balochistan. Under this initiative, since 2011 twenty small grant projects and one regional project have been launched and completed all along the coastline of Pakistan with the financial assistance of MFF.

Preparation of 5th National Report

The Fifth National Report to Convention on Biological Diversity (CBD) was prepared as a part of the National Biodiversity Strategy and Action Plan (NBSAP) revision process that is being conducted through a Global Environment Facility Trust Fund project entitled "Support to Pakistan for the Revision of the NBSAPs and Development of Fifth National Report to the CBD". The 5th national report was submitted to CBD secretariat in 2014.

Revision of National Biodiversity Strategy & Action Plan

Previous Biodiversity Action Plan (BAP) was prepared in 1999 and new revision intends to align the NBSAP with strategic plan of CBD 2011-2020 and its Aichi Biodiversity Targets. Biodiversity Directorate is currently revising NBSAP. An agreement with IUCN Pakistan was signed to take up the assignment of Revision of the National Biodiversity Strategy and Action Plan.

Keeping in view the experience of preparation of the first Biodiversity Action Plan, the project is being executed in collaboration with IUCN Pakistan. Establishment of provincial focal committees for monitoring, implementation and coordination of CBD in all the provinces including Azad Jammu and Kashmir (AJK) and Gilgit-Baltistan (GB) have been proposed in the plan. A draft NBSAP was prepared during FY2015 with the consultation of provinces including GB and AJK and launching ceremony of the same was held on 5th November 2015.

Nagoya Protocol

The Cabinet approved the Summary for Accession to Nagoya Protocol on Access and Benefit Sharing (ABS) arising from the utilization of genetic resources under Convention on Biological Diversity on 28th July, 2015. Instrument of Accession to Nagoya Protocol on ABS was signed by the President of Pakistan on 12th October, 2015. Draft ABS law has already been prepared by the Biodiversity Directorate in consultation with the provinces, and is being shared again for their inputs to finalize the process during 2016.

Global Snow Leopard and Ecosystem Protection Programme

The Global Snow Leopard and Ecosystem Protection (GSLEP) Programme seek to address high mountain development issues related to the conservation of the charismatic and endangered snow leopard as a flagship species. The GSLEP is a range wide effort that unites 12 range country governments (Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan), non-governmental and intergovernmental organizations, local communities, and the private sector around a shared vision to conserve snow leopards and their valuable high mountain ecosystems.

National Report on Urban Development of Pakistan

Habitat III is the United Nations Conference on Housing and Sustainable Urban Development that will take place in October 2016. Habitat-III will be the first UN global summit after the adoption of the Post-2015 Sustainable Development Agenda. The objective of Habitat III is to secure renewed political commitment for sustainable urban development, assess accomplishments to date, address poverty and identify and address new and emerging urban challenges for the establishment of the New Urban Agenda.

Ministry of Climate Change has developed National Report of Pakistan 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.

Clean Development Mechanism (CDM)

The Kyoto Protocol to UNFCCC was adopted at the 3rd Meeting of the Parties held in Kyoto, Japan, in 1997. Under the Protocol, developed countries agreed to reduce their combined green house emissions³. CDM is the only instrument that is available for developing countries to assist them in achieving sustainable development

³ UNFCCC website, CDM Executive Board, Bonn; CDM – Pakistan website

and contributing to the ultimate objective of the Convention. CDM, Pakistan from 2005-2014, has accorded Host Country Approval to 71 CDM Projects out of which 38 projects are registered with UNFCCC (United Nations Framework Convention on Climate Change) which will generate Certified Emissions Reductions (CERs). The estimated amount of GHG mitigation/year from these 38 registered projects is 4.91 million tons of CO₂, total GHG mitigation/project period for 38 registered projects is 91.17 million tons of CO₂. Estimated CDM revenue from 38 projects per year is US\$ 61.31 million and estimated CDM revenue from 38 projects and total project cost is US\$ 1.13 billion. The extension of CDM for another 8 years provides a tremendous opportunity for Pakistan to benefit from the International funding mechanism.

Nationally Appropriate Mitigation Actions (NAMAs)

NAMA is a set of government prioritized policies, strategies, programmes and actions aimed at reducing or limiting GHG emissions. The government can initiate the NAMAs through collaboration of relative departments and private sector. It also emphasizes financial assistance from developed countries to developing countries to reduce GHG emissions.

The following seven NAMA proposals were submitted to UK German NAMA facility during its second call and UNFCCC NAMA Registry to seek International funding:

- a) Accelerating the market transformation to energy efficient lighting
- b) Supporting mechanisms for promoting distributed generation (net metering, wheeling, banking etc.) in Pakistan to put a 3 GW Alternative and Renewable Energy (ARE) projects in next seven years.
- c) Strategizing for grid strengthening / improvement for evacuation of power from solar power projects
- d) Strategizing for grid strengthening / improvement for evacuation of power from wind power projects
- e) Development and installation of carbon dioxide sequestration technologies in Pakistan

- f) Harnessing municipal waste of big cities of Pakistan to generate electricity
- g) Bio-energy generation and greenhouse-gases mitigation through organic-waste utilization

These seven NAMA projects will reduce 12.16 million tons per year GHG emission if climate finance to the tune of € 101.62 million is available through international climate finance.

Comprehensive Reduction and elimination of Persistent Organic Pollutants in Pakistan (POPs)

The main objectives of this project are reducing human health and environmental risks by enhancing management capacities and disposal of POPs in Pakistan through:

- i. The development and implementation of regulatory, policy and enforcement system to reduce POPs releases and to regulate POPs waste disposal;
- ii. Capacity building to reduce exposure and releases of POPs;
- iii. Collection, transport and disposal of 300 tons to Poly Chlorinated Biphenyls (PCB) and 1200 tons of POPs Pesticides. The elimination of POPs pesticide stockpile became even more urgent after the 2010 floods which damaged some of the storage sites of hazardous chemicals and pesticides. To ensure environmentally sound disposal of POPs, facilities are to be upgraded, tested and permitted in compliance with Stockholm Convention best available techniques (BAT) and best environmental practices (BEP).

Technology Needs Assessment (TNA) Committee

TNA is a systematic approach for conducting technology needs assessments in order to identify, evaluate and prioritize technological means for both mitigation and adaptation. It also provides processes and methodologies for uncovering gaps in enabling frameworks and capacities and for formulating a national action plan to overcome them, as part of overall climate change strategies and plans such as NAMAs and National Adaptation Plans (NAPs). With the support of Climate Technology Centre and Network

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

Second National Communication (SNC) & Biennial Update Reports (BURs)

BUR is an extended report on National Communications. It describes the status of GHG Emissions and mitigation measures taken by the countries. Work on Pakistan's first BUR is expected to be started soon. The preparation for Pakistan's Second National Communication (SNC) on Greenhouse Gases (GHG) emissions has been started. This will be a three year study leading to stocktaking of all GHG emissions in Pakistan with options of mitigation and adaptation actions.

International Practices:

The Kyoto Protocol focused on promoting low-carbon development through the Clean Development Mechanism (CDM). Although the CDM has undoubtedly resulted in some low-carbon investment that would not have otherwise occurred; it has not prompted fundamental shifts in development patterns. The United Nations Environment Programme is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system. The UNEP has launched several initiatives, including the Global Bio-energy Partnership (GBEP) to support the deployment of biomass and bio-fuels, and the Solar and Wind Energy Resource Assessment (SWERA).

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 at 30th November 2015 in Paris where world leaders including Pakistan hammered out 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 main focus was to mitigate pledges in terms of global annual emissions of green house gases by 2020 and aggregation emissions pathways consistent with holding the increase in the global average temperature to well below 2°C above industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

Carbon Capture and Storage

Carbon capture and storage is a new technology which focuses on securing and storing carbon dioxide emissions before they are released into the atmosphere. Although this technology is still in its early stages, successful pilot projects offer hope of developing and implementing it for large-scale projects. Some countries are committed to implementing variations of it and both bilateral and multilateral cooperation is under way. This cooperation is particularly important because implementing CCS on a large scale can be expensive and offers few obvious economic benefits. EU-China Partnership on Climate Change helps to develop Near-Zero Emissions Coal (NZEC) plants in China using CCS technology. The United States and China have also recently agreed to develop joint projects using CCS technology.

Carbon Sequestration Leadership Forum

The purpose of this forum is to accelerate the research, development, demonstration, and commercial deployment of improved cost effective technologies for the separation and capture of carbon dioxide for its transport and long term safe storage or utilization. FutureGen, led by the U.S department of energy, harnesses public and private-sector funds and expertise to help build near-zero emissions plants around the world.

International Atomic Energy Agency

Renewable and nuclear energy will be critical in diminishing reliance on fossil fuels and

developing low-carbon communities. Expectations for nuclear power as an alternative source of energy are especially high among big emitters such as India, China, and the United States, as well as in a number of developing countries that lack the necessary infrastructure to meet their growing energy needs. The International Atomic Energy Agency (IAEA) assists countries in determining whether nuclear energy is a feasible option.

International institutions have begun to promote domestic policy shifts through measures like technical assistance on tariff reductions for environmentally friendly technologies through the WTO, and processes aimed at phasing out fossil fuel subsidies spurred through the G20.

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 Islamabad Capital Territory. The following major activities are being undertaken by PAK-EPA

I. EIA/MONITORING

- i. During the period 2015-16 six Initial Environmental Examination (IEE) reports and seven Environmental Impact Assessment reports EIA have been received for review at this Agency which is under process for review.

II LAB/NEQS

- i. Working on oxo-biodegradable plastic bags. The biodegradable plastic bags regulations were developed to curb environmental pollution due to increased accumulation of plastic bags that leads to health hazards, choking of sewerage lines, choking of watercourses and problem in ship navigation.
- ii. Monitoring of industrial area 1-9 and 1-10 for control of the pollution.
- iii. Visited the several industries for import the non-hazardous chemical and issue the NOCs. Pak-EPA visited 61 hospitals for checking their Hazardous Management Service and received monthly waste report.

- iv. Worked on implementation of Euro-II standards for 2 & 3 wheelers and ensuring Euro-II complaint diesel in the market latest by June, 2017.
- v. Environmental pollution, Rawal dam Catchment area, Supreme Court action. Lab/NEQS section monitored the Rawal Lake and Bari Imam area.
- vi. Evaluated and monitored the audit and performance report of different certified laboratories and waste companies.
- vii. Checking of traffic pollution on busy roads during peak hours. Stack emission monitoring of the factories, especially marble factories in Islamabad.
- viii. Survey of the brick kilns pollution in and around Islamabad.
- ix. Checking of water quality of the filtration plants of Islamabad.

II. LEGAL/ENFORCEMENT

- i. Pak-EPA served 4 notices u/s 16 (1) of the Pakistan Environmental Protection Act, 1997 to various polluters in the capital under the provision of PEP Act, 1997.
- ii. 12 Environmental Protection Orders issued with the direction to stop their activities till compliance of section 12 of PEP Act, 1997 and NEQS.
- iii. Notified amendment in regulations on prohibition Oxo-Biodegradable plastic bags.
- iv. Finalized amendments in Pakistan Environmental Protection Act, 1997 and IEE/EIA Regulations 2016
- v. Established Clean Environment Fund under Pakistan Environmental Protection Act, 1997.
- iii. Haze and smog formation will be curtailed by tapping sources of ammonia, nitrogen oxides and sulphur oxides emission.
- iv. Air quality of all major cities shall be continuously monitored and disseminate to general public.
- v. The fresh water sources will be categorized and protected against pollution.
- vi. All major cities will install sewage treatment plants. The treated water will be used for agriculture and horticulture purposes.
- vii. 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.
- viii. Wastewater Discharge limits shall be imposed on industry to conserve water and reduce pollution load.
- ix. Provincial Cleaner Production Centers will be established to promote waste minimization, recycling and waste exchange.
- x. Investment windows and incentive schemes shall be announced to encourage installation of treatment plants.
- xi. Environmental Engineering Industry shall be recognized and encouraged to manufacture treatment plants locally.
- xii. Integrated solid waste management system shall be promoted.
- xiii. Solid waste shall either be converted to RDF or used for Waste-to-Energy.
- xiv. Cloth bags, paper bags and biodegradable plastic bags will only be allowed.

Future Environmental Quality Control Measures

- i. 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.
- ii. Industrial sector will be facilitated with well-designed and efficiently operated air cleaning devices.

Conclusion

Pakistan is the sixth largest nation of the world in terms of population size, having tremendous amount of natural resources, a variety of ecological regions and highly productive coastal zones. There are many causes and driving forces for these environmental problems like air and water pollution, natural depletion and loss of biodiversity. Increasing urbanization and expending industrialization are some of the major

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driving forces which are putting negative effects on the environment. The government is conscious of the need for environmental protection and has undertaken a number of measures through

enacting legislation, setting standards and developing and implementing policies for a secure and lively environment.

