

# **Pakistan Intended Nationally Determined Contributions (INDCs)**

## **Our Commitment to UNFCCC and INDCs**

In accordance with Article 2 of UNFCCC, the Parties to the Conventions are required to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. Its Article 4 also accepts the principles of common but differentiated responsibilities and equity which include, inter-alia, that the developed country Parties take actions for mitigation, finance and technology transfer to developing country Parties; while developing country Parties actions to include adaptation ( plus loss and damage), mitigation, capacity-building and sustainable development (integration, including food security etc.).

Within this framework, 20<sup>th</sup> session of the Conference of the Parties of UNFCCC held in Lima required all its Parties to submit their Intended Nationally Determined Contributions (INDCs) the kind of commitments, contributions, and actions that Parties are considering to undertake in the period beyond 2020-2030 to achieve the objectives of the Convention. This document is intended to meet this requirement.

INDCs is, therefore, an initial official information channel to communicate Pakistan's efforts to respond to the challenges of the climate change to the global community. This statements of contribution is further to convey 'an intention only', subject to what is agreed at the 21<sup>st</sup> session of COP of UNFCCC scheduled at Paris, in accordance with the Durban Mandate regarding the nature, scope, legal form, and details, which are currently under negotiations.

INDC-Pakistan would, therefore, not constitute an international obligation of the country, and its implementation will be based on the domestic and external resources. It is also based on the current socio-economic conditions, and provides projections for the period 2020-2030. It shall be periodically updated, based on national circumstances.

In the absence of specific guidelines about the format etc. of the national INDC, and shortage of time for consultations among the stakeholders are some of the limitations of this document. It has also been noted that there are many gaps in knowledge on the effects of INDC targets on socio-economic development. Likewise, significant investments are required for adaptation and energy-based options to achieve targets, which were not available. The private sector is also not forthcoming to invest in renewable energy resources and adaptation.

## **Process of Preparation of INDC-Pakistan**

Ministry of Climate Change acted as the lead focal agency of Pakistan for the preparation of INDC-Pakistan. Its steering committee included Ministries of Planning, Development and Reforms; Water and Power; Industries and Production; Commerce; National Food Security and Research; Communication; Science and Technology; Finance, Revenue, Economic Affairs and Statistics; Housing and Works; and Foreign Affairs and the Provinces. The INDC Working Team in the Ministry of Climate Change compiled the draft report on INDC-Pakistan in close association with the relevant agencies and organization of the Federal and Provincial Governments, universities, research organizations; NGOs; UN Organizations; Lead-Pakistan and representatives of the private sector. The World Bank facilitated this process.

Four Consultative Workshops covering all stakeholders were organized before, and after the commencement of the task of preparation of INDC-Pakistan.

The INDC-Pakistan has been approved by the Minister of Climate Change for submission to the UNFCCC Secretariat at Bonn, Germany.

## **Social and Economic Situation of Pakistan**

### **Area and Geography**

Pakistan, officially the Islamic Republic of Pakistan, is one of the major countries in South Asia has an area of 796,095 sq. km. It is a profound blend of landscapes varying from plains to deserts, forests, hills, and plateaus ranging from the coastal areas of the Arabian Sea in the South to the mountains of the Karakoram ranges in the North.

Pakistan is bordered by Afghanistan to the North-West and Iran to the West while the People's Republic of China borders the country in the North and India to the East. Its western borders include the Khyber Pass and Bolan Pass that have served as traditional migration routes between Central Eurasia and South Asia.

It has an exclusive economic zone (EEZ), covering an area of 240,000 sq. km; with additional continental shelf area of about 50,000 sq. km. As such, the total maritime zone of Pakistan is over 30 percent of the land area, and this region is characterized by distinctive oceanic phenomena, that produces rich fisheries, mineral, and hydrocarbon resource. Pakistan has a coastline of 1046 km, which connects it with the maritime world.

It has 4 provinces, and 7 autonomous agencies in the federally administered tribal areas lying between Pakistan and Afghanistan.

### **Population**

Pakistan's estimated population in 2015 is over 191.71 million, making it the world's sixth-most-populous country. During 1950–2011, Pakistan's urban population expanded over sevenfold, while the total population increased by over fourfold. In the past, the country's

population had a relatively high growth rate that has been changed by moderate birth rates. In 2014, the population growth rate stood at an estimated rate of 1.49%. The expected population of Pakistan would be around 251 million in 2025 and 344 million in 2050.

Trends in social changes and economic pressures have led to rapid urbanization and the emergence of megacities in Pakistan. During 1990–2003, Pakistan recorded its lead as the second-most urbanized country of South Asia with city dwellers making up 36% of its population. It is estimated that about 50% of Pakistanis now reside in towns of 5,000 people or more.

Pakistan has a multicultural and multi-ethnic society and hosts large number of refugees from the neighboring country, and temporarily displaced persons from within the country. It has sizable young population, for which about 1.5 million new jobs will need to be created every year to keep unemployment rate at its existing level.

Frequent floods in the monsoon and drought in the dry seasons are normal phenomena with huge recurring social and economic costs to the country

The Demographic history of Pakistan from the ancient Indus Valley Civilization to modern era includes the arrival and settlement of many cultures and ethnic groups in modern region of Pakistan from Central Asia, Middle East and Europe.

As per 2014 estimates, the Life Expectancy in Pakistan is 67.05 years; 65.16 for male and 69.03 for female.

## **Economy and other Indicators**

### **Overview**

Pakistan's economy with GDP of USD 246.88 billion ranks 26th largest in the world in terms of purchasing power parity (PPP), and 41st largest in terms of nominal Gross Domestic Product. In terms of GDP, per capita income is USD 1,512. Economists feel that it has a potential to become one of the world's large economies in the 21st century, if it overcomes the after effects of decades of war in the region and social instability. Presently, it has serious deficiencies in basic services such as railway transportation and electric power generation, and low levels of investments in social sector, like health, education, and social safety nets. The economy is semi-industrialized, with centres of growth along the Indus River. Primary export commodities include textiles, leather goods, sports goods, chemicals and carpets/rugs, while exports include industrial machinery, edible oil, petroleum and petroleum products.

Physical growth of Pakistan's economy is concentrated along the Indus River, coexisting with the lesser developed area in other parts of the country. The economies have significantly diversified in Karachi and other major urban centers in the Punjab. Its challenges include

internal political disputes, a fast-growing population, mixed levels of foreign investment, and frequent current account deficits.

Pakistan is currently undergoing process of liberalization with, includes privatization of government corporations, aimed to attract foreign investment and decrease budget deficit. In 2015, foreign currency reserves crossed USD 18 billion which has led to stable outlook in the global financial markets.

Recent government's monetary policies has contributed to a reduction in money-market interest rates, and a great expansion in the quantity of credit, changing consumption and investment patterns.

### **Structure of economy**

Historically, agriculture accounted for the major share of GDP. While per-capita agricultural output has grown since then, it has been outpaced by the growth of the non-agricultural sectors, and the share of agriculture has dropped to roughly one-fifth of Pakistan's economy. In recent years, the country has seen rapid growth in industries (such as apparel, textiles, and cement) and services (such as telecommunications, transportation, advertising, and finance). The economy of Pakistan periodically suffer from high inflation rates. But it is now reasonably controlled at 8.7 percent in 2014-15. Recently, however, over 1,081 patent applications were filed by non-resident Pakistanis revealing a new-found confidence in the prospects of the Pakistan economic outlook.

### **Income inequality and poverty**

Between 2003-2007 Pakistan experienced growth rates of GDP, averaging about 7% per year. Lately, it has slowed down to 4.24 % per year. It is estimated that it will rebound to bring the country in the category of fast growing economies. The agriculture posted growth rate of 2.5%, industry 3.6% and services 5%.

According to a research report, the size of the Pakistani middle class is conservatively estimated at approximately 70 million, out of a total population of about 191 million. This represents 40% of the population of the country. Despite this, the poverty levels remain pervasive. The broad distribution of income and poverty in terms of Gini coefficient is 0.41. The household income or consumption by percentage share is 4.1% for lowest; 27.7% for the highest; and 10.4% for the middle class.

On measures of income inequality, the country ranks slightly better than the median. In late 2006, it was estimated that there are almost 2.8 million income-tax payers in the country. This number has now greatly reduced, meaning that only about 1% of the population pays direct taxes. As a result, the government has to often resort to indirect taxes to maintain its level of income from taxes and duties.

## **Social Safety Nets**

Over half of the population of Pakistan lives below the poverty and absolute poverty line. The government has therefore initiated several programmes of financial and non-financial support to the various categories and target groups of poor segments of the society. These among others include Benazir Income Support Programme, Pakistan Bait-ul-Mal and Zakat targeting the more poor and vulnerable sections of society living in the urban and rural areas.

The government is following a sustained poverty reduction strategy and allocated a minimum of 4.5% of GDP to social and poverty related expenditure. In actual terms, the total expenditure on prioritized 17 pro-poor sectors as per Poverty Reduction Sector Strategy-II (PRSP-II) in a year is over USD 16.7 billion. It has helped cutting poverty levels in the urban and rural areas. Rural poverty nevertheless remains a pressing issue, as development there has been far slower than in the major urban areas.

Pakistan Poverty Alleviation Fund (PPAF) also provides assistance in microcredit, water, infrastructure, drought mitigation, education, health and emergency response interventions. PPAF on an average disburses about USD 1.2 billion to its clients in a year.

## **Revenues and Expenditure**

Pakistan is a Federation with constitutional division of taxation powers between the Federal Government and the four provinces. During 2014-2015, total revenue was around USD 27 billion. It includes both tax and non-tax revenues. The revenue department of the Federal Government, the Federal Board Revenue, collected almost 70% of the entire national revenue.

On expenditure side, total yearly expenditure amounts to USD 37 billion. Out of which, about USD 5 billion is available as Public Sector Development Programme (PSDP) support to the federal and provincial governments. Private sector mobilizes resources for investment through private savings, banks and other commercial channels.

## **Foreign Economic Assistance**

Pakistan receives economic aid from several sources as loans and grants. The International Monetary Fund (IMF), World Bank (WB), Asian Development Bank (ADB), etc. provide long term loans to Pakistan. Pakistan also receives bilateral aid from developed and oil-rich countries. About 93% of this assistance came to Pakistan in the form of loans, and remaining in the form of grants. These resources are utilized for support to finance development projects, budgetary support, and meeting debt repayment obligations.

Presently the debt burden of Pakistan stands at USD65.533 billion, equivalent to about 65.8 percent of GDP. Against this liability, there is a need for gross financing of about USD 10.8 billion in a fiscal year. In case, the country resources are short of this requirement, the

government has to mobilize additional loans or grants. This situation often leads to shortage of financial resources for undertaking new and additional development projects in the country.

### **Annual Development Plan of the Federal and Provincial Governments**

Total size of the Federal Budget for 2015-2016 is about USD 44.5 billion with an estimated resource availability of USD 41.68 billion. Major portion of the allocated budget goes to meeting current expenditure, and about USD 15.14 billion remains available for Public Sector Development Programme (PSDP) at the federal level and in the provinces. Out of this allocation, about USD 8.14 billion is provided to the provinces, and USD 7.0 billion given to the Federal Ministries for their development projects. Some portion of the federal share is allocated to Pakistan Millennium Development Goals (MDGs): Community Development Programme, Special Federal Development Programme, and rehabilitation programmes of earthquake affected areas of Kashmir and Northern Areas of Pakistan.

The country is presently in the midst of the serious energy crisis, which is affecting almost all sector of economic, especially the export oriented industries. An investment of about USD .....billion is required in the next.....years. Likewise, frequent high floods adds additional burden on the economy to the tune of .....percent of GDP. In the backdrop of these huge investment needs in these sectors of economy, financing of mitigation and adaptation costs to climate change in key sectors of intervention (agriculture, energy, and water) estimated at USD .....billion is a challenge on the existing financial resources of the country. It is also precisely the reasons that in the absence of domestic financial resources, Pakistan has not been able to sequester potential of about 400 Mt CO<sub>2</sub> eq. from forestry, land and land use sector changes.

The above competitive demands on our budget resources leave very small leeway to undertake new projects in the area of mitigation, adaptation, capacity building within the framework of UNFCCC and other imperatives of sustainable development at the local, provincial and federal level. Even the institutions are weak to prepare good projects for financing from the opportunities available global financing facilities such as GEF, Adaptation Fund, Green Climate Fund (GCF).

### **Pakistan's Share to Global Greenhouse Gases (GHG) and the Contributing Activity Sectors**

Preparation of Initial National Communication on the implementation of UNFCCC by the developing countries Parties is one the requirements of the Convention. One of the constituent

components of these Communications is the National Inventory of Greenhouse Gases, prepared in accordance with the IPCC Guidelines. These inventories are to be periodically revised, updated, and made part of subsequent National Communications for submission to UNFCCC secretariat on an agreed time frame, in keeping with IPCC Guidelines in vogue at that time.

Pakistan submitted its Initial National Communication to UNFCCC Secretariat in 2003. Work on the preparation of its Second National Communication is currently in process, and in the meantime Inventory of Greenhouse Gases of Pakistan was updated in 2012. The next Inventory of GHGs will be prepared for incorporation in the Second Pakistan National Communication in accordance with the applicable IPCC Guidelines approved for this purpose by UNFCCC.

As per the updated GHG Inventory, the total emission of GHGs in Pakistan in the year 2012 has been estimated at 369 Gt-eq. Co<sub>2</sub>, which equal to about 0.8% of the global GHG emissions. On per capita basis, Pakistan with 2.06 Gt per capita GHG emissions stand at 135<sup>th</sup> place in the world ranking of the countries on the basis of their per capita GHG emissions.

It is insignificant compared to several other countries of world of same size and at the same level of development. The country is nevertheless fully committed to all commitments and obligations to UNFCCC, and taking all necessary actions in accordance with the decisions of its Conference of Parties, and its subsidiary bodies. The preparation of INDCs is a step in this direction.

As per the above Inventory, major contributing activity sectors of Carbon Dioxide gas are the 'Energy', 'Emissions from biomass', 'Land Use Changes and Forestry', and 'Industrial Processes'. In case of Methane, the main activity source sector is 'Enteric Fermentation', followed by 'Fugitive Emissions from Oil and Natural Gas'; 'Solid Waste Disposal on Land' and 'Rice Cultivation'. Emissions of Nitrous Oxide and Oxides of Nitrogen are generally contributed by the 'Field Burning of Agricultural Residue', and 'Transport', respectively. Emissions of 'Sulphur Dioxide' and 'Carbon Monoxide' have linkages mostly to 'Transportation' and 'Energy Industries'. The latter activity sectors would be the priority sectors for mitigation options in keeping with the national development priorities, and the imperatives of sustainable development.

The accumulation of GHGs in the atmosphere, however, proportionately or disproportionately impact almost all sphere of human activities, priorities have to be established for various adaptive measures so that basic needs of the society, such as food, water and damages to life

and property of people, and ecosystems due to frequent natural disasters, attributable to climate change, are avoided.

## **Vulnerability to Climate Change**

Many sectors, activities, and target groups are vulnerable to the threats of climate change in Pakistan. These among others include: increased variability of monsoon; rapid recessions of glaciers of Hindu Kush-Karakorum in the Himalayas, threatening water flows in the Indus River System and increased siltation of downstream water reservoirs; increased risk of floods and droughts; heat-stressed conditions in the arid and semi-arid regions leading to reduced agriculture productivity; intrusion of saline water in the Indus delta affecting coastal ecology and fishery production, and increased cyclonic activity in the coastal belt due to high sea surface temperatures.

The above threats lead to major concerns of Pakistan resulting in deforestation; loss of biodiversity, increased health risks. The threats to the major vulnerable ecosystem include range lands, degraded land and mountain areas.

## **Pakistan Vision 2025**

Pakistan vision 2025 recognizing global warming and climate change as an explicit area of engagement in its long term planning and development and instituting project and non-project interventions in the vital areas of energy, agriculture, water, and food security. For this purpose the following goals have been set for responding to climate change.

- Design water, food and energy security policies and plans of the country with specific reference to the profound challenges posed by climate change.
- Recognition of the relevant risks and associated economic and social costs and implementation of well-defined mitigation and adaptation strategies and measures.
- To promote long term sustainability, conservation and protection of natural resources.

It also reaffirms that Pakistan will strengthen its relationships with UNFCCC to explore further opportunities for more cooperation and collaboration.

## **Pakistan's Response**

Pakistan's response to the challenges of global warming and climate change has been in the context sustainable development, environmental protection, millennium development goals,

sustainable development goals and objectives of the convention on climate change. As a result several legal and institutional arrangements have been made at the national, provincial and local levels.

Environmental protection and climate change have recognized in the National Long Range Plans, Annual Budgets, Public Sector Development Programme (PSDP) and Economic Survey of Pakistan. Some of these activities are iterative and nature, and documents relating thereto are published on annual and/or on regular basis and are reflective of our continuing commitments to the climate change issues.

The specific activities and responsibilities relating to climate change concerns are coordinated by a dedicated Ministry of Climate Change at the federal level with corresponding support from the provincial and city governments. The Ministry of Climate Change also work in tandem with the other concerned Federal Ministries and Divisions, research organizations, universities and private sector.

The Ministry of Climate Change is also responsible to supervise and control several Government and Public Sector Autonomous Agencies, namely: Global Change Impact Studies Centre (GCISC); National Disaster Management Authority (NDMA); Pakistan Environmental Protection Agency (Pak-EPA); Zoological Survey Department of Pakistan (ZSD). It has also separate wings to deal with matter relating to Environment, Climate Change and Forestry and Wildlife directly reporting to the Secretary and the Minister of Climate Change.

At the operational level, frequent interaction is maintained with the Pakistan Metrological Department (PMD), Pakistan Agricultural Research Council (PARC), Federal Flood Commission (FFC), Water and Power Authority (WAPDA), Energy Conservation Centre (ENERCON) and many private sector organizations and NGOs.

Following affirmative actions have been taken by the Ministry of Climate Change to meet the challenges of climate change in Pakistan:

- After the submission of Initial National Communication of Pakistan on the implementation of UNFCCC Convention in Pakistan, a Task Force on Climate Change was established in the Planning Commission of Pakistan in 2008 to take stock of country situation in relation to climate change, and to prepare a framework for the formulation of Climate Change Policy of Pakistan. This report was available to the government in 2010
- The exiting Task Force on Climate Change established in the Planning Commission of Pakistan has been elevated to a permanent Prime Minister's Committee on Climate Change.

- A Disaster Risk Reduction Framework has been developed by National Disaster Management Authority for implementation in the country in association with the provincial and metropolitan authorities
- National Climate Change Policy was approved by the Government of Pakistan and published in 2012
- A Framework for Implementation of Climate Change Policy 2014-2030 was prepared and circulated amongst all stakeholder in 2013
- An Inter-ministerial Inter-agency Committee been set up in the Ministry of Climate Change to steer and oversee implementation of National Climate Change Policy and its Framework

The Climate Change Policy and its implementation Framework makes key recommendation relating to mitigation measures in the energy, animal and livestock and forestry sector; and adaptation measures in water resources, agriculture and livestock, coastal area and Indus Deltaic Region, and forest and other vulnerable ecosystem. The other recommendations relate to (a) organizational structure at the federal, provincial and local level; (b) use of CDM and other market mechanism to support climate change activities; (c) capacity building; and (d) financing of climate change regime using national and international resource. Some of the key recommendations presently under consideration of the government are summarize as under:

## **Mitigation Measures**

### **Energy**

- Energy efficiency improvement at all levels in the energy system chain
- Energy conservation measures and use of energy-efficient devices
- Rapid development of hydropower resources, and large scale use of various economically viable renewable energy technologies, such as windmills and solar cells
- Development of mass transit systems in large cities
- Infrastructure development for large scale import of natural gas
- Increase in hydropower generation capacity

### **Agriculture and Livestock**

- Adopt new methods of rice cultivation that have promise of lower methane emissions
- Follow new methods of fertilizers for reducing Nitrous Oxide releases from agricultural soils
- Promote new breeds of cattle, more productive in terms of milk and meat yield, and reduce methane emissions form enteric fermentation

- Development of economical feeds, which not only reduce methane production, but also promise better nutrition to the livestock

### **Forestry**

- Intensive effort on afforestation and reforestation
- Preservation of rangelands through proper rangeland management
- Increase of grasslands using appropriate varieties of grass in saline and waterlogged zones
- Introduce genetically impoverished species, or those that have important ecosystem functions by providing natural migration corridors
- Use of gene banks, seed banks, zoos and botanical gardens for preserving genetic diversity and conserving species out of their natural environment.

### **Adaptation Measures**

#### **Water Resources**

- Development of additional water reservoir capacity on the river system to regulate water discharges during high floods years and to maintain an ecological downstream flows
- Promote local rain water harvesting and development of small storages on run of the rivers during peak flows in the system
- Demand management and efficiency improvement measures in water-use sectors, particularly in the supply, distribution and use of irrigation water
- Reuse of marginal quality domestic waste water for agriculture purposes
- Increase capacity of existing large water reservoirs
- Improving efficiency of water supply and distribution in the irrigation system
- Development of capacity to deal with disasters like floods, droughts and cyclones

#### **Agriculture and Livestock**

- Development of new breeds of crops of high yield, resistant to heat stress, drought tolerant, less vulnerable to heavy spells of rain, and less prone to insects and pests
- Improvement of crop productivity per unit of land and per unit of water by increasing the efficiency of agricultural input as well as input of irrigation water
- Improvement of farm practices by adopting modern techniques (laser land levelling, crop diversification, proper cropping patterns, optimized planting dates etc.)

- Development and introduction of better varieties of livestock which would have higher productivity of milk and are less prone to heat stress and more drought tolerant

### **Coastal Areas and Indus Deltaic Region**

- Provision of regulated flows down Kotri Barrage in the Sindh province to conform to minimum necessary environmental flow to Indus delta
- Restoration and protection of mangroves in the deltaic region
- Construction of proper engineering structures (dyke and seawalls) to protect beaches and other facilities along the Karachi coast
- Development of capacity to deal with natural disasters (coastal tides, storm surges, cyclones etc.)

### **Forests and Other Vulnerable Ecosystems**

- Launch massive afforestation and reforestation programmes with species sensitive to the climate change threat
- Preservation of rangelands through proper rangeland management
- Increase of grasslands using appropriate varieties of grass in saline and waterlogged zones to prevent their degradation

### **Education, Communication and Awareness**

- Promote education, and awareness of the challenges of climate change and need to respond to them with the knowledge and available options to the appropriate target groups
- Make use of all available channels and modes of communications appropriate in each case (print and electronic media, publications, portal website, advertising, showcasing model practices, specific campaigns, etc.)

### **Institutional Capacity for Addressing Climate Change**

- Capacity enhancement of the Ministry of Climate Change and its attached organizations to appropriately respond to the emerging threats of climate change at the policy and programme levels

- Enhance knowledge of relationship between climate change and social and economic development to effectively communicate and lobby with the Ministry of Finance for allocation of more resources for this sector
- Introduction of climate change related scientific disciplines in Pakistan's leading universities so as to ensure a regular supply of trained manpower
- Establish of a National Repository for maintaining climatological, hydrological, agrometeorological and other climate change related data to cater for the needs of all relevant institutions
- Expansion of meteorological monitoring stations in various parts of the country, in particular in the northern mountainous areas and over the Arabian Sea adjoining Pakistan's coastline
- Development of a cohort of professionals in the field of climate change by getting a group of young scientists trained with the help of reputable foreign institutions in fields such as regional climate modelling, watershed modelling and crop growth simulation modelling
- Forecasting of seasonal and inter-annual climatic changes and extreme events
- Monitoring of temporal changes in glacier volumes and land cover using satellite imagery and GIS techniques

**Monitoring and Evaluation:** It will also be in the country's interest to establish a suitable a process for monitoring and evaluating the costs versus benefits of potential actions, the effectiveness of interventions in reducing vulnerabilities to climate change, and overall progress towards the achievement of adaptation objectives. It will ensure that adaptation measures are appropriate, being implemented effectively and are adjusted on regular basis in response to new information and knowledge. Such an approach will also contribute to improvement in the national development planning processes.

#### Pakistan's Initial Contribution to UNFCCC during the Period 2020-2030

Pakistan reiterates its unequivocal commitments to objectives and obligations set forth in UNFCCC. These are evident from the various developments and activities described earlier. Most of these efforts are, however, been driven by national financial resources, except few projects which have been implemented with the support of financial mechanisms available under the Convention. The task is nevertheless very big that requires mobilization of support and financial resources of the international community to this global challenge.

Consultations are now under way to enhance actions which can be implemented beyond 2020. The emphasis would be to open up new prospects for green and low-carbon development, which also contribute to sustainable development at the national and global level.

Pakistan as a developing country with a population of about 192 million and is categorized in those countries that are most severely vulnerable to the adverse impacts of climate change. Agriculture is its main stay, which has the limited potential to generate substantial financial resources for investment. The society is also rapidly transforming due to urbanization, industrialization and use of high communication technologies thereby adding to the challenges relating to economic development, poverty reduction, improvement of living standards, environmental protection and combating climate change.

So mitigation of greenhouse gases to reduce the adverse impacts of global warming is not only Pakistan's domestic requirement in terms of economic development, energy security, water security and foods security and creating a climate resilient society, but also as a global responsibility for the overall good of the mankind.

To this effect, Pakistan has been voluntarily taking all steps for reducing emission of greenhouse gases from industrial processes and controlling line-losses from its natural gas network spreading in all provinces and federal areas as well as creating new sinks greenhouse gases by afforestation and reforestation. The energy conservation and efficiency measures are being enforced in the agriculture, construction, energy, and transport sectors using mass awareness campaigns and standards of manufacturing of industrial appliances and machinery. Inter-fuel substitution is encouraged and supported wherever feasible.

The energy-mix of Pakistan is eco-friendly with a lot reliance on natural gas and the share of coal of as a source of energy is very low, even though it has vast coal reserves in Thar for 500 year. Vision 2025 and Five-Year and Annual Development Plans of Pakistan also lay emphasis of low-carbon and low emission development.

In this pursuit, by 2014 the following has been achieved:

- ✓ Carbon dioxide emissions per unit of GDP around 2 Gt of CO<sub>2</sub> is being maintained for the last 20 years despite pressing needs of energy for development.
- ✓ The share of non-fossil fuels in primary energy consumption is 38.6%
- ✓ The forested area and forest stock volume are increased respectively by .....million hectares and ..... billion cubic meters compared to the 2005 level
- ✓ The installed capacity of hydro power is 6,499 Megawatt, and work on the construction of Diamer Bhasha Dam has commenced. On completion it will have water storage capacity of ..... and hydroelectric power of .....Megawatt.

- ✓ The installed capacity of on-grid wind power is 106 Megawatts and three plants of 150 Megawatt are under construction. 13 additional projects with combined capacity of 680 Megawatt are in the final stages of financial close
- ✓ The installed capacity of solar power is 100 Megawatt and progress on the implementation of 1000 Megawatt solar power plant is in process. In addition 33 Letters of Interest for cumulative capacity of about 888 Megawatt on-grid PV power plants have issued. Four private companies have already submitted the feasibility studies of their plants. National Electric Power Regulatory Authority (NEPRA) has already notified the upfront tariff of solar power for the Northern and Southern Regions of the country.
- ✓ Four Biomass/Waste-to-Energy of capacity 48 MW are in various stages of implementation under IPP mode. Power Co-generation project based on Biomass/Bagasse of an installed capacity of 1500-2000 MW of power are expected in next 2-3 years. Letters of Interest have already been issued to 11 sugar mills/companies and upfront tariff has been notified by NEPRA.
- ✓ The installed capacity of nuclear power is 4,273 GWh (2 times of that for 2005).

To narrow down on the above recommendations and prioritize areas for actions in the immediate timeframe, background papers on the following aspects of climate change were commissioned to identify various options for interventions along with quantified potential for mitigation of GHGs in each case:

- Mitigation of GHGs in Energy Supply and Energy Demand
- Mitigation of GHGs in Agriculture and Forestry
- Mitigation of GHGs in Transport Sector
- Adaptation to Climate Change
- Loss and Damage due to Natural Disasters

Each working group identified various options for intervention along with their mitigation potential in each case. These options were then ranked in order of high and low priority in consideration to their implementation possibilities in Pakistan.

On the basis of prevailing situation in the country, its level of development, financial resources, and commitments as well as international support to climate change under the common but differentiated responsibilities, Pakistan has nationally determined its actions as follows to make efforts for reducing carbon dioxide concentration in the atmosphere around 2030:

## **Mitigation**

- Energy Supply: 37 % GHG emissions reduction from BAU in 2030, equal to 35 Mt Co<sub>2</sub> in GHG reduction in 2030

- Energy Demand: 22% GHG emission reduction from BAU in 2030, equal to 50 Mt Co<sub>2</sub> in GHG reduction in 2030
- Transportation: 8% GHG emission reduction from BAU in 2030, equal to 5.64 Mt CO<sub>2</sub> in GHG reduction in 2030
- Agriculture and Forestry: 5.5% emission reduction from BAU in 2030, equal to 11.3 Mt CO<sub>2</sub> reduction in 2030

## **Adaptation**

In line with the Vision 2025 of Pakistan, Ministry of Climate Change should establish a dedicated National Adaptation Plan (NAP) at the federal level to create a framework to guide the mainstreaming of medium and long term climate change efforts into policies, strategies and programmes at the federal and provincial level. It will thus provide a basis for a more coordinated approach within and between different levels of government.

Along with NAP, Sectoral and Provincial Adaptation Plans should be prepared on the basis National Climate Policy and its Implementation Framework. These plans shall also support NAP and its implementation.

The above plans (national, sectoral, provincial) so formulated will also incorporate all recommendations and actions, which are part of the existing development activities or those activities that will be implemented in the future. These will also provide opportunities of synergy between development and environmental protection.

Pakistan will also continue to concentrate on various actions for adaptation to climate change in the most vulnerable sector such as agriculture, forestry, improve irrigation system, natural disasters, cities and coastal areas, fragile ecosystem with corresponding support like capacity building, financial resources, know-how and technology transfer.

## **II. POLICIES AND MEASURES TO IMPLEMENT ACTIONS UNDER INDC-PAKISTAN ON CLIMATE CHANGE**

To achieve the nationally determined contributions to climate change, Pakistan shall endeavor to building on actions already taken, and would provide an enabling environment leading to successful results. These among others may include: (a) sustain an appropriate rate of social and economic growth; (b) behavioral changes in the consumption pattern; (c) application of scientific and technological knowledge in adaptations at the national, provincial and sectoral levels; (d) integration of climate change concerns in economic planning and decision making; (e) building up necessary institutions at all levels; (f) development of low carbon emission scenarios with all possible options for implementation; and (g) strictly enforce National Environmental Quality Standards, including parameters relating to greenhouse gases emissions in urban areas.

### **Promoting Low-Carbon Society**

Massive education and awareness campaigns about the climate change issues will be made part of the curricula at schools. Newspaper, radio and televisions channels will be encouraged to create awareness about the adverse impacts of climate change and how can they participate in promoting and building a low carbon society by opting to the use of low carbon products and avoid use of transport where they can use bicycles or walk.

### **Creating Climate Resilient Society**

The overall climate resilience lies in disaster preparedness, development of climate responsive infrastructure and the strength of social services. It helps to funding for new technologies to help communities to prepare for a changing climate, setup incentives to build smarter, and more resilient infrastructure. Urban resiliency and human resiliency would result from improving infrastructure and by focusing on societal preparation to decrease the country's vulnerability to the impacts of climate change. It will be met through: (a) improved and safe operation of infrastructure of water conveyance, and better management of transport operations and energy transmission in the wake of climate change; (b) development and optimization of allocation of water resources, implementing the strictest water management regulation, and intensifying the development and utilization of unconventional water resources, including recycled water, and rain and flood water; (c) lining of canals and irrigation channels; (d) improve the emergency response mechanism of extreme weather and climate events; and strengthen the development of disaster reduction and relief management systems.

### **Low-Carbon Development Growth Pattern of Cities and Towns**

These objectives will be achieve by introducing innovations in urban planning to mitigate and adapt to the adverse impact of climate change by the following actions:

- Estimate the fuel and energy needs of the expanding cities
- Design transport corridors for fast and efficient urban transportation
- Amend building laws to ensure that all new building are constructed using architectural designs appropriate to local climate
- Promote lifestyle, adaptation, and choices, through civil society organization that requires less energy
- Advance low-carbon pilots in provinces and cities
- Explore diversified patterns of low-carbon growth

### **Scientific and Technological Support**

- Expansion of meteorological monitoring stations in various parts of the country, including northern mountainous areas and over the Arabian Sea adjoining Pakistan's coastline
- Development of a cohort of professionals in the field of climate change by getting a group of young scientists trained with the help of reputable foreign institutions in fields such as regional climate modelling, watershed modelling and crop growth simulation modelling
- Forecasting of seasonal and inter-annual climatic changes and extreme events
- Monitoring of temporal changes in glacier volumes and land cover using satellite imagery and GIS techniques, and
- Integration of results of scientific and technological findings into the climate policy at various levels

## **Financing**

Pakistan is signatory to major environmental Convention and protocols, and as such is eligible for availing under various financing mechanisms, such as Global Environment Facility, Clean Development Mechanism, Adaptation fund, Forest Carbon Partnership Facility and Green Climate Fund. However, most of these facilities require special focus and generally meet the incremental cost etc. The baseline development expenditure on projects etc. required to be met either from the country's own resources or to be mobilized from bilateral and multilateral global resources. As a result, the portfolio of climate related projects in developing countries like Pakistan remain fully untapped. To overcome this predicament, the following options will be explored:

- Position Pakistan vis-à-vis other developing countries to access financial resources from existing mechanisms available under the climate change regime
- New global financial mechanisms may be considered under UNFCCC for their availability to the developing country Parties
- A dedicated national climate change fund will be established in Pakistan for financing mitigation and adaptation components of the development projects
- Pursue the developed countries to provide new and additional financial resources for climate related activities to the developing countries
- Develop public and private sector partnerships for financing climate change related projects
- Create domestic carbon market by instituting an appropriate investment framework, link with regional development banks, including a robust mechanism for the reporting, verifying and certifying of carbon emissions
- Introduce green government procurement policy system and encourage energy efficient and low carbon products

### **Data on GHG Emissions**

Appropriate creation of data on GHG emissions and their regular update is necessary for development of climate change policy and programme development framework. For this purpose, it is necessary to:

- Strengthen the collection of data and statistics of climate change
- Generate local emission factor in all sectors and activities relating to climate change covering areas such as energy, industrial process, agriculture, land-use change, forestry and waste treatment
- prepare greenhouse gas inventories at the national and provincial level on a regular basis
- Disaggregate greenhouse gas emission data by major industrial units so as to institute appropriate response mechanisms at that level
- Encourage exchange of data on greenhouse gas emissions amongst the developing countries at regular intervals

### **Promoting International Cooperation on Climate Change**

Pakistan is committed to all objectives of UNFCCC, and will continue to do in future for the overall benefit of all humanity. It will therefore actively engage with the international community in development of a responsive global climate governance that is beneficial to all. Together with other Parties, Pakistan will promote and support low-carbon, climate resilient and development through capacity building, research and development and economic development in the spirit of equity and common but differentiated responsibilities. It is therefore expected that developed countries will enable the developing countries to take the lead in substantially reducing their own emissions and to provide support of finance, technology and capacity building to developing countries.

Pakistan's challenges are far many and their full participation in climate change initiatives will depend on providing more opportunities of equitable access to sustainable development, greater financial support, technology transfer, capacity building and promoting cooperation between developed and developing countries. Any such cooperative engagement between North-South and South-South to take on international commitments that are relevant to national circumstances will be supported. Pakistan will fully participate in all programmes aimed at supporting mutual learning, exchange of experiences, promote climate friendly technologies, transfer of data and information for common benefit. Pakistan will also actively participate in international dialogue and exchanges on addressing climate change, and there positive outcomes in building a just and sustainable world.

### **2015 AGREEMENT NEGOTIATIONS**

Pakistan is committed to UNFCCC, and would continue to beso in its implementation by working with all other parties of the Convention to arrive at a balance and regional agreement

at the Paris Conference. The emphasis should however go primarily to achieve objectives of the Convention. The outcomes of the negotiations shall be in accordance with the principal of the equity and common and differentiated responsibility in full regard to the national circumstance and development stages and capacity and capability. It should reflect on all its element in a balanced way, including mitigation, adaptation, finance, technology, development, and transfer and capacity building. The negotiations should be open, transparent, inclusive, Party-driven and consensus-based.

The outcome of the negotiations should constitute a regular decision of the Conference of the Parties, with separate listing of the contributions by the developing countries.