Pakistan NDC implementation framework template Document

Background

Pakistan is a lower middle-income country with GDP at USD 284 billion. Pakistan's contribution to global greenhouse gas emissions is meager however the impacts of climate change faced in the country are abundant. Pakistan has been ranked 8th most vulnerable country to the impacts of climate change[1] and adaptation is biggest domestic climate change challenge faced by Pakistan today. ND-Gain Index[2] has placed Pakistan as the 27th least ready' country in the world to address the impacts of climate change. The increased temperatures, varied precipitation and monsoon patterns, and increased emissions have resulted in increased frequency of extreme weather events (floods, tropical cyclones, droughts, landslides, Glacial Lake Outburst Floods (GLOFs)); consequently impacting livelihood and food security. In addition, Pakistan's air quality has been significantly worsening accounting for PKR 62-65 Billion losses annually. Government of Pakistan (GoP) has lately taken multiple actions to respond to air pollution and climate change in an integrated manner and plans to continue the efforts through focused interventions.

Paris Agreement and Pakistan's Contribution

Pakistan ratified the Paris Agreement in 2016 and as an obligation under Article 4 of the Paris Agreement's Nationally Determined Contribution (NDC) update process, the Ministry of Climate Change, Government of Pakistan (MoCC) submitted Pakistan's updated NDCs in 2021. Aimed at achieving reduced poverty and ensuring stable economy, the updated NDCs commit to abate overall 50% of Pakistan's projected GHG emissions by 2030. The enhanced commitment will be contributed by the shift to 60% renewable energy for electricity generation, and 30% to electric vehicles by 2030 and complete ban on the use of imported coal. The success of restoring the forest cover and conservation efforts was corroborated when the latest GHG inventory of 2018 reported an 8.7% decline in projected GHG emissions for the year 2018 (sequestration of 8.4 Mt CO2e)(**Error! Reference source not found.**). Encouraged by these analytics, Pakistan commits to enhance its reliance on Nature-based Solutions (NbS) underpinned by the fact that Ten Billion Tree Tsunami program (TBTTP) will alone sequester 148.76 $MtCO_2e$ if fully implemented (**Error! Reference source not found.**).

[1] GermanWatch Climate Risk Index 2021 Available at: https://germanwatch.org/en/19777
[2] ND-Gain Index Available at: https://gain-new.crc.nd.edu/country/pakistan

To achieve these set commitments, it is estimated that transition to renewable energy will cost Pakistan US$ 101 billion by 2030 plus additional US$ 65 billion by 2040 given costs involved in completing in-progress renewable energy projects, building additional hydropower (US$50 Billion by 2030 and US$80 Billion by 2040) and transmission lines (US$ 20 billion), and phasing out coal (US$ 18 billon to buy out Pakistan's coal power plants and US$ 13 billion to replace the energy production capacity of coal power plants with solar). Pakistan's adaptation cost ranges of between US$ 7–14 billion per annum to 2050. Financing these initiatives is considered a challenge in NDCs and Pakistan in the NDCs commits to employing the instruments on enhanced ambition provided in Article 6 of the Paris Agreement, public-private partnerships and international climate finance opportunities including Green Climate Fund (GCF), Global Environment Fund (GEF) etc.

NDC Implementation

Strategic objectives

It illustrates a pathway for implementing outlined activities and articulates aspects of the enabling environment that may need strengthening to reach the targets set out in the updated NDC. To achieve this goal, following **objectives** are pursued:

- Strengthening enabling environment (e.g., policies, regulations, institutional arrangements) to overcome articulated challenges and barriers to implementing activities committed
- Identify possible sources of funding and Monitoring Reporting and Verification (MRV) for the implementation of the NDC in all economic sectors, with a view to develop a financial investment plan
- Increasing awareness among stakeholders[3] about what is required to achieve the NDC targets by seeking technical expertise, increasing buy-in for action in new areas and building knowledge capital in key institutions

Provincial Chapters

The 18th amendment to Pakistan's constitution in 2010 has led to delegating more power to provinces. MoCC being the national entity, is responsible for formulating the national policies and provinces are responsible to adopt these policies into their planning and operations in different economic sectors. Since climate change is a cross

[3] Public, private, donors/investors, academia, development banks, etc.

sectoral subject and in some cases provincial and local capacities are limited on climate change concepts, MoCC understands the need for provinces to adopt NDCs in to a form of a roadmap with monitoring and evaluation mechanism. This activity is a subsequent action to "Priority actions, Implementation schedule and Costs" which will essentially provide a good evidence on what actions to prioritize in what sectors based on the costs and logistics and when to implement. The **provincial roadmap formulation** will follow following proposed steps:

- *Taking stock of the NDC sectors at sub-national level which will essentially cover the understanding of what targets are being committed in NDCs and how provincial level policy instruments and actions will be implemented. This will also require identification of gaps for regular stock-taking to report back to UNFCCC.*
- *Assessing the human and information capacities required for NDC implementation for prioritized actions in priority sectors which will help devise a plan to build capacity in both short and long terms.*
- *Assessing the policy instruments and institutional readiness for implementing the NDC which will cover analysis of different mitigation and adaptation policy instruments and deciding most suitable approach to attain desired NDC outcomes. This will also require an overhaul of existing practices in terms of policies as well as roles and responsibilities among different economic sectors based on addressing bottle-necks to NDC implementation.*
- *Assessing the regulatory framework to review regulatory frameworks to ensure that these can help drive NDC implementation and bring about the agreed policy objectives*
- *Mapping the financial support which will then inform national climate finance framework*
- *Monitoring progress and reporting back to MoCC on decided set of indicators consistent and captured within the national inventory, BTR reporting, and feed into the Paris Agreement's global stocktake*

The proposed steps will require extensive stakeholder consultations to ensure larger political buy-in and ownership among various actors involved in successful implementation of the roadmap. Through literature and data collected during NDC update process, following impacts are recognized in provinces:

Punjab: Punjab is most populous and second most urbanized province of the country. It is recognized as the breadbasket of Pakistan. Punjab constitutes around 69 % of the total cropped area and 57 % of the total cultivated land of Pakistan. Punjab is responsible for providing 80 % of wheat, 83 % of cotton, 97 % of fine aromatic rice, 51 % of maize and 63 % of sugar cane to the national food production. Whereas, the province accounts for 66 % of mangoes, 34 % of dates, 82 % of guavas and more than 95 % of citrus fruits to the national production of fruits[4]. The impacts of climate change such as environmental and land degradation, water scarcity, crop failure, ineffective use of agricultural inputs, and reduced crop yield have resulted in the lowering of agricultural share of the province from

[4] Government of Punjab, Agriculture Department. Available at: www.agripunjab.gov.pk

31 % to 20 %[5]. Numerous diseases are prevalent in Punjab due to poor water quality and inadequate sanitation infrastructure. It has been reported that malnutrition is one of the serious concerns that plagues the province, particularly in children. Urban planning is of utmost importance as the rural to urban migration is expected to increase. In context of urban planning, government of Punjab has put its focus on the improvement of water supply, drainage, sewage and sanitation, solid waste management and vehicular emissions. If due importance is not given to urban planning, then it can lead to environmental impacts in the urban centers which include water scarcity, energy crisis and air pollution.

Sindh: Sindh is the coastal province with a long coast line of 350 km located in the southeast of Pakistan that is not only the most populous metropolis but also has a commercial hub. The climate change has caused frequent occurrence of calamities such as droughts, heat waves, floods etc. in Sindh. In the last century, the water level along the Karachi coast has ascended by 10 cm and is expected to rise further by 60 cm by the end of this century, thus putting the low-lying coastal area of Karachi under the risk of infrastructure and livelihood loss. This coastal belt is prone to cyclones. Literature has reported an average of four cyclone events per century in Sindh. During the period of 1971-2001, the intensity and frequency of cyclones have increased manifold. Evidence of sea-level rise has been found along the coast line. The following figure shows the rise in sea-level, between the years 2007-2011. About 78 % of the Sindh groundwater is saline, thus making it unsuitable for drinking purposes. National Disaster Management Authority has declared the districts of Dadu, Sukkur, and Tharparkar as drought-prone areas. Furthermore, the regions of Achhro Thar, Kachho, Kohsitan, Nara and coastal belt have also been affected badly by the climate change. Like droughts, Sindh has experienced all types of flood which are; Monsoon floods, Flash floods, Floods due to breeches, Urban floods and Coastal floods. In Sindh, the occurrence of heat waves during the pre-monsoon season is common and causes stress on human health. Major area of the province is situated in the intense heat zone, which is anticipated to observe a temperature rise of 4-5 °C, during the 21st century.

Balochistan: Balochistan continues to suffer from the risks of extreme events, and due to the inadequate disaster response system and isolated population, these extreme events are rapidly transformed into disasters. Since 2007, the coastal area of Balochistan has already experience number of intense cyclone events such as Cyclone Yemin (2007), Cyclone Gonu (2007) and Cyclone Phet (2010). In monsoon season, these basins get flooded and cause overspilling of reservoirs and small dams. Thus, the population in the flood plains and catchment areas, are living in a constant fear that anytime a new wave of flash flood can occur and can wash away their homes and other properties. Rain-fed agriculture is dominant form of agriculture in Balochistan. However, due to less rainfalls in cultivation time, cultivation of crops has become difficult. The variation in the temperature and rainfall patters along with the exploitation of groundwater extraction, the water scarcity will become an important challenge for the

[5] Punjab Growth Strategy 2018 (PGS), (2015) retrieved from: http://www.theigc.org/wp-content/uploads/2015/04/Punjab-Growth-Strategy-2018-Full-report.pdf

people, economy and environment of Balochistan. Balochistan has experienced many extreme droughts in the past, i.e., 1967-1969, 1971, 1973-1975, 1994, and 1998-2002, that have drastically affected the livelihood and economy of the province. The drought was also responsible for the spread of numerous diseases such as Crimean Congo Hemorrhagic Fever (CCHF), Tuberculosis, Hepatitis, Malnutrition, Malaria, Chicken Pox, Scabies, Measles and many others. The infant and under-fiver mortality in Balochistan is estimated to be 72 and 89 per thousand birth, respectively. This rate is higher in rural areas as compared to urban areas.

Khyber PakhtunKhwa: KPK is the third-largest province in terms of population while it is the smallest as far as area of the provinces are concerned. Glacial Lake Outburst Floods (GLOFs) are one of the main natural hazards that have impacted the province. The uncontrolled dumping of chemicals in surface-water bodies, over extraction of groundwater, exploitation by water intensive manufacturing processes, and increased pressure due to deforestation, agriculture, population growth, and impacts of climate change have aggravated the water stress issues in the province. The burden on the natural resources is aggravating due to the urbanization, delicacy of uncultivated land and ineffective existing irrigation system. The province is highly dependent on the import of various products from other provinces, one of which is wheat. The crop yield is low as the quality of fertilizer and seed is not up to the standard. Around 7.67 % of total cultivable land of Pakistan lies in the province of KPK and almost half of this land in KPK is dependent on rain for carrying out agricultural activities. Thus, a decrease in the water supply can have an extreme spill-over effect, not only in KPK but in neighboring provinces as well. The magnitude of the climate-induced disasters can be evaluated from the data compiled by the Federal Flood Commission (2016), which specified that the combined flow of Swat and Kabul rivers has touched a new historical height of 400,000 as compared to the previous value of 250,000 cusecs recorded in 1929. The rise in the frequency of flash floods and floods are likely to cause surface runoff, avalanches, river bank cuttings, soil erosion and landslides damaging properties, roads, houses and agricultural lands.

Gilgit Baltistan and Azad Jammu and Kashmir: Just like KPK, GB and AJK are responsible for the supply of electricity for the entire country from its hydro-power stations. The regions are responsible for the operation and maintenance of these infrastructures and require additional resources to convert these to climate resilient infrastructure. In addition, region is also prone to GLOFs, flash floods, avalanches, heatwaves etc.

Provinces will undergo the stages highlighted under **provincial roadmap formulation** to prioritize areas of intervention for short, medium and long-term. Based on these prioritization, MoCC will be coordinating with provinces and will regularly monitor and evaluate their progress. The quarterly progress reports submitted by provinces will also be a way for provinces to communicate their needs like finances, technical assistance etc. to MoCC to make necessary arrangements. These financial needs will then inform financial framework covered in next section.

Based on the national and sub-national situation analysis, following actions with responsibilities and targets were committed in updated NDCs:

Table-1: Overarching Mitigation Objectives & Supporting Initiatives

Objective	Supporting Actions	Lead Organization	Potential Indicators	Goals	Priority by Provinces (H,M,L)
To ensure efficient, affordable and renewable energy supply	Increase in grid efficiency and transmission infrastructure	NTDC/Provincial Departments	Annual improvement in energy efficiency	Increase energy efficiency with combined sectoral targets to achieve a total of 1.5% annual improvement in energy efficiency	
	Mechanisms for grid flexibility and greater integration of VRE	NTDC/ Provincial Departments	Number of RE options explored	At least 20% RE generation6 by 2025 and at least 60% by 2030	
	Improvement in coal efficiency and exploration of green coal technologies	Ministry of Energy (MoE) – Power Division/ Provincial Departments	Number of green coal technologies identified		
	Large scale and distributed grid connected solar, wind and hydroelectricity	AEDB/ Provincial Departments	Ratio of energy mix		
	Support the deployment of ARE technologies: Promoting innovation and technology transfer to ensure availability of renewable technology at	AEDB/ Provincial Departments	Number of low-cost renewable options explored		

[6]Including hydropower

	reduced costs (including offshore) Onshore large-scale wind and solar projects		Percentage increase in RE generation		
	Exploration and development of storage technologies to tackle RE intermittency	AEDB/ Provincial Departments	Number of options proposed for RE intermittency		
	Utilizing other alternative energy sources for generating electricity	AEDB/ Provincial Departments	Percentage of electricity generation from alternate sources	Transition from biomass to electricity in 15% of households by 2050	
	Research and development programs for carbon capture and sequestration	Ministry of Climate Change (MoCC), GCISC/ Provincial Departments	Number of research reports developed for policy uptake		
Improve mechanisms and procedures to provide for effective conservation and efficient use of energy	Efficient irrigation motors/pumps (electric), fans, boilers/furnaces, stoves, water heaters and LEDs, etc.	NEECA/ Provincial Departments	Annual improvement in energy efficiency	Increase energy efficiency with combined sectoral targets to achieve a total of 1.5% annual improvement in energy efficiency	
	Green Building codes and certification for new and refurbished buildings, including revolving guarantee mechanism for energy efficient appliances	NEECA/ Provincial Departments	Energy efficient building codes notified Number of buildings certified Revolving guarantee mechanism operationalized		
	Mandatory energy audits of large energy consuming industries and companies	NEECA/ Provincial Departments	Number of energy audits conducted		
	Explore and adopt cap and trade schemes and carbon levies to manage industrial emission efficiency	MoCC/ Provincial Departments	Reduction in industrial emissions		
	Promotion of Energy Standards and Labeling (ESL)	NEECA/ Provincial Departments	Audit reports on enforcement of standards		
	Tax exemptions for hybrid and EVs	Ministry of Industry (MoI)/ Provincial Departments	Number of vehicles purchased	30% shift to electric passenger vehicles and 50% shift to electric two/three wheelers and buses by 2030	
	Establishing recharging network for EV adoption	MoI with MoE/	Number of charging stations		

		Provincial Departments		90% shift to electric passenger vehicles and 90% shift to electric two/three wheelers and buses by 2040	
	Transition to Euro 5	MoE (Petroleum Division)/ Provincial Departments	Reduction in air pollution		
Promote climate smart inputs and management practices in agriculture and livestock management	Improve irrigation practices and water management	Provincial agriculture department	Reduction in drop per crop		
	Climate resilient agriculture/agroforestry practices	Ministry of National Health Services, Regulation & Coordination (MoNHSR&C) / Provincial Departments	Number of farmers trained on farming techniques		
	Introduce climate resilient seed varieties	MoNHSR&C & Provincial Departments of Agriculture (DoAs)/ Provincial Departments	Number of crop varieties developed and piloted.		
	Promotion, storage and management of green manure	MoNHSR&C & DoAs/ Provincial Departments	Area of land using green manure		
Promote energy efficient practices in industries	Ensure the provision of gaseous fuels at cheaper rates	Provincial Departments	Reduction in prices for energy efficient fuels		
	Introduce and practice Polluter Pays Principle (PPP)	Provincial Departments	Number of industries audited		
	Introduce Refrigeration and Air Conditioning (RAC) standards, and labels	NEECA/ Provincial Departments	Standards and labels notified		
	Switching to zig-zag Brick kiln technology to mitigate SLCP	Provincial departments	Number of units switched approx. 10,000		
	N2O abatement from nitric acid plants at comparatively low cost that accounted for 5.1% of the total Industrial emissions in 2015	Nitric and fertilizer productions plants Provincials EPAs & regulatory agencies,	Number of plants converted to low emitting technology and selling their credits in the open market	Reduction of 0.9% of the total Industrial emissions for 2030 after the strong growth in this sector	

		National Fertilizer Corporation, and academic institutes./ Provincial Departments			
Promote conservation and sustainable management of area under cover	Mass afforestation through the involvement of government agencies, provinces, local governments and non-state actors	MoCC and provincial forest department	Area afforested or number of new plants planted	1 million ha afforested	
	Conservation and management of existing forests by controlling deforestation, protecting forest reserves, and controlling other anthropogenic disturbances	Same as above/ Provincial Departments	Increase in forest cover		
	Conservation and restoration of mangroves, peatland ecosystems, and coastal & marine ecosystems to reduce emissions and revive natural carbon sink	Provincial forest department	Increase in restored area as carbon sink		
	Maintaining forest inventories and increasing capacity for monitoring and modeling carbon changes	MoCC, GCISC and provincial forest department	Annual forest inventory reports		
	Encouraging private investments in farm forestry	MoCC and provincial forest department	Number of private investments		
	Develop a comprehensive management system for protected areas including coastal wetlands	MoCC/ Provincial Departments	Number of management plans generated		
	Establishment of a transboundary ecological corridor	MoCC/ Provincial Departments	Number of ecological corridors established		
Promote 3Rs and improve waste management practices	Enacting by-laws on land use (landfills, sewage treatment plants and power plants, waste-to-energy schemes and recycling)	Provincial department	Number of laws enacted		

	Infrastructural development for waste collection, transfer stations and treatment facilities	Same as above/ Provincial Departments	Number of operational waste treatment facilities		
	Promoting a culture of recycling and reuse	Same as above and Environmental Protection Agency (EPA)/ Provincial Departments	Reduction in waste generation		
	Installation of hospital and other on-site waste incineration devices	Provincial department	Number of onsite waste management facilities		
	Material Flow Analysis to generate the evidence on plastic waste management	MoCC / Provincial department	Number of studies conducted		

Source: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Pakistan%20First/Pakistan%20Updated%20NDC%202021.pdf

Table 2: Supporting Adaptation Actions & Indicators

Objective	Supporting Actions	Lead Organization	Indicators	Priority by Provinces (H,M,L)
Agriculture				
Promote climate smart inputs and management practices in agriculture	Development of crop varieties and livestock breeds resistant to heat and water stresses	National Agricultural Research Centre (NARC), DoAs/ Provincial department	Number of crop varieties developed, piloted and approved	
	Develop sustainable soil fertility improvement practices	DoAs/ Provincial department	Area of land with sustainable soil fertility improvement practices	
	Adopt mechanical and biological control methods to keep pest populations under control and to protect soil fertility and nutrient value agricultural produce	Ministry of National Food Security & Research (MoNFSR), NDMA, PDMA & DoAs\ Provincial department	Area of land with systemic protection from pests	
Water Resources				
Improve irrigation and	Demand management measures to increase water-use efficiency and productivity	MoWR, Provincial P&DDs, DoIs	Number of demand management measures developed and piloted	

water management	Construction of large and small reservoirs, rain harvesting and storage, groundwater recharge, groundwater management, etc. to improve inter-seasonal water availability	MoWR, Provincial P&DDs, DoIs	Number of small/large reservoirs constructed or rehabilitated	
	Introduction of water conservation technology and techniques in irrigated agriculture	MoWR, DoIs/ Provincial department	Number of water conservation technology and techniques piloted	
Biodiversity and Other Vulnerable Ecosystems				
To build resilience through nature-based solutions and protection of ecosystems and biodiversity.	Wildlife corridors for preservation and protection of wildlife species. Also, Develop community-focused management plans for protected areas	MoCC/ Provincial department	Number of wildlife corridors established	
	Adoption of good practices of natural grassland management in livestock production	Provincial livestock departments	Area of land protected with sustainable grassland management practices	
	Management of notified areas in collaboration with local communities under the Protected Areas Initiative	MoCC/ Provincial department	Area of land restores/conserved under Protected Areas Initiative	
	Prioritize the consideration of "blue" nature-based solutions (NbS).	MoCC/ Provincial department	Number of 'blue' nature-based solutions piloted.	
	Increase coastal areas under protection, notably through the creation of new marine protected areas and the demarcation of extensive no-take zones	MoCC/ Provincial department	Length of coastal areas protected	
Disaster Preparedness				
Mitigate impacts of extreme events through preparedness and capacity building.	A hydro-meteorological monitoring system for developing an operational system on water-related DRR products and effective dissemination through online systems	NDMA, FFC, MoWR / Provincial department	Hydro-meteorological monitoring system developed	
	Establishment of a credible national water, weather, and climate database to tackle natural disasters	NDMA, FFC, GCISC, Pakistan Metrological Department (PMD)/ Provincial department	Climate database established	
	Promote the use of space technologies and digital innovation in DRR, agriculture water management through gender-	NDMA, FFC, GCISC, PMD/ Provincial department	Number of capacity development initiatives undertaken	

	segregated data and capacity development for national partners			
	Cost-effective innovative disaster risk management solutions to reduce the loss of life, infrastructure, and livelihoods at all scales	PDMAs/ Provincial department	Number of cost-effective innovative disaster risk management solutions implemented	
	Develop a nationwide scale Multi-Hazard Vulnerability and Risk Assessment (MHVRA) in a Spatio-temporal format including detailed and location-specific assessments to providing comprehensive risk information	NDMA / Provincial department	MHVRA developed	
Health				
Incorporate health and environment in climate and disaster risk reduction related policies and vice versa.	Enhance research regarding impacts of climate change on health	Ministry of National Health Services, Regulations and Coordination. (MoNHSR&C)/ Provincial department	Number of research studies conducted	
	Increase monitoring of climate-sensitive diseases and introduce forecasting systems to increase effective planning prior to pandemic and disease outbreaks	MoNHSR&C/ Provincial department	Number of monitoring and forecasting systems developed	
	Establish mechanisms to facilitate collaboration between health, nutrition and energy professionals, including dialogue and collaboration between Ministries of Health, Climate and Energy as well as multi-sectoral co-operations	MoCC, GCISC and MoNHSR&C/ Provincial department	Number of multi-sectoral collaboration mechanisms operationalized	
	Obtain reliable data on health co-benefits of climate ambition in Pakistan to inform policies in various sectors- energy and carbon pricing	MoCC/ Provincial department	Number of relevant studies undertaken	
	Adoption of One Health mechanism	MoCC/ Provincial department	One Health mechanism adopted	
	Develop Geographic Information System (GIS) mapping to identify climate change/health impacts hotspots and implement specified	MoNHSR&C/ Provincial department	Number of health adaptation programs implemented with support of GIS tools	

	health adaptation prevention and control programs			
	Develop standardize emergency procedures and stockpiling of essential medicines in advance	NDMA& PDMAs/ Provincial department	Number of standardized emergency procedures developed	
	Ensure and adopt measures to improve child mortality rates and associated women's health issues	MoNHSR&C/ Provincial department	Number of measures adopted to improve child mortality rate	
	Adopt a Health in All Policies (HiAP) approach to energy policy	MoNHSR&C/ Provincial department	HiAP approach to energy policy adopted	
WASH				
Improve climate resilience of communities through improved development outcomes in WASH sector	Vulnerability analysis for potential adaptation options targeted and designed for specific needs of communities	MoCC (GCISC)/ Provincial department	Number of relevant vulnerability assessment studies undertaken	
	Adopt low cost, climate resilient technology available for infrastructure	MoCC/ Provincial department	Number of low-cost climate resilient technologies piloted	
	Explore opportunity for metered water supply on cost recovery basis	MoCC/ Provincial department	Number of pilots rolled out for metered water supply	

Source: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Pakistan%20First/Pakistan%20Updated%20NDC%202021.pdf

Appendices

Appendix 1 Template to be completed by provinces

Mitigation:

Objective	Potential Indicators	Priority actions by Provinces (H,M,L)	Immediate Action/ Long term Action	Activity Cost	Timeframe	Stakeholders/Implementing Organization
	Energy Supply					
To ensure efficient, affordable and renewable energy supply	Annual improvement in energy efficiency					
	Number of RE options explored					
	Number of green coal technologies identified					
	Ratio of energy mix					
	Number of low-cost renewable options explored Percentage increase in RE generation					
	Number of options proposed for RE intermittency					
	Percentage of electricity generation from alternate sources					
	Number of research reports developed for policy uptake					
	Energy Demand					
Improve mechanisms and procedures to provide for effective conservation and	Annual improvement in energy efficiency					
	Energy efficient building codes notified Number of buildings certified Revolving guarantee mechanism operationalized					
	Number of energy audits conducted					
	Reduction in industrial emissions					

efficient use of energy	Audit reports on enforcement of standards					
	Number of vehicles purchased					
	Number of charging stations					
	Reduction in air pollution					
			Agriculture			
Promote climate smart inputs and management practices in agriculture and livestock management	Reduction in drop per crop					
	Number of farmers trained on farming techniques					
	Number of crop varieties developed and piloted.					
	Area of land using green manure					
			Industry			
Promote energy efficient practices in industries	Reduction in prices for energy efficient fuels					
	Number of industries audited					
	Standards and labels notified					
	Number of units switched approx. 10,000					
	Number of plants converted to low emitting technology and selling their credits in the open market					
			Forest and Land-use			
Promote conservation and sustainable management of area under cover	Area afforested or number of new plants planted					
	Increase in forest cover					
	Increase in restored area as carbon sink					
	Annual forest inventory reports					
	Number of private investments					
	Number of management plans generated					
	Number of ecological corridors established					
			Waste			
Promote 3Rs and improve waste	Number of laws enacted					
	Number of operational waste treatment facilities					

management practices	Reduction in waste generation					
	Number of onsite waste management facilities					
	Number of studies conducted					

Adaptation:

Objective	Indicators	Priority by Provinces (H,M,L)	Immediate Action/ Long term Action	Activity Cost	Timeframe	Stakeholders
	Agriculture					
Promote climate smart inputs and management practices in agriculture	Number of crop varieties developed, piloted and approved					
	Area of land with sustainable soil fertility improvement practices					
	Area of land with systemic protection from pests					
	Water Resources					
Improve irrigation and water management	Number of demand management measures developed and piloted					
	Number of small/large reservoirs constructed or rehabilitated					
	Number of water conservation technology and techniques piloted					
	Biodiversity and Other Vulnerable Ecosystems					
To build resilience through nature-based solutions and protection of ecosystems and biodiversity.	Number of wildlife corridors established					
	Area of land protected with sustainable grassland management practices					
	Area of land restores/conserved under Protected Areas Initiative					
	Number of 'blue' nature-based solutions piloted.					
	Length of coastal areas protected					
	Disaster Preparedness					
Mitigate impacts of extreme events through preparedness and capacity building.	Hydro-meteorological monitoring system developed					
	Climate database established					
	Number of capacity development initiatives undertaken					

	Number of cost-effective innovative disaster risk management solutions implemented					
	MHVRA developed					
	Health					
Incorporate health and environment in climate and disaster risk reduction related policies and vice versa.	Number of research studies conducted					
	Number of monitoring and forecasting systems developed					
	Number of multi-sectoral collaboration mechanisms operationalized					
	Number of relevant studies undertaken					
	One Health mechanism adopted					
	Number of health adaptation programs implemented with support of GIS tools					
	Number of standardized emergency procedures developed					
	Number of measures adopted to improve child mortality rate					
	HiAP approach to energy policy adopted					
	WASH					
Improve climate resilience of communities through improved development outcomes in WASH sector	Number of relevant vulnerability assessment studies undertaken					
	Number of low-cost climate resilient technologies piloted					
	Number of pilots rolled out for metered water supply					

Cross-cutting themes:

Gender

Objective	Potential Indicators	Priority actions by Provinces (H,M,L)	Immediate Action/ Long term Action	Activity Cost	Timeframe	Stakeholders
Agriculture, Forestry and other land-use Change						
Identifying rights-based and gender-responsive measures **Ensure that plans, strategies, programs and budgets of government bodies, funding agencies and NGOs promote gender equality and access to resources** **Assessing the differential impacts of actions in the agriculture sector**	Trainings and workshops conducted for women farmers Number of women employed/self-employed Number of women engaged in protected area management Non timer products prompted in TBTTP and other forestry initiatives					
	Number of women accessing information					
	Number of incentive schemes designed for women					
	Number of awareness sessions conducted Number of women present at various forums					

	Number of national level forums for better gender integration Number of sectoral policies integrating gender					
	Number of indicators for data collection identified					
Water Sector						
Promoting the role of women in water resource management	Number of union level associations formed					
	Number of capacity building workshops					
	Number of females targeted extension services launched					
	Number of women-led indigenous technologies identified and promoted					
Energy Sector						
Ensure gender integration for efficient energy production, consumption and distribution	Number of information packs disseminated					
	Number of trainings conducted					
	Number of women adopting energy-efficient technologies					
	Number of women accessing credits/loans					
	Number of women employed					
Disaster Management						
Introduce social-safety nets with a focus on climate change adaptation for socio-economic development	Number of safety net schemes					
	Number of awareness programs					
	Education material developed					

	Sensitization sessions conducted					
	Number of livelihood options designed					
	Number of women earning income					
Waste Sector						
Improve waste management and recycling practices	Number of awareness sessions					
	Number of women represented in decision-making forums					
	Number of women accessing credit					
	Number of pilots					
Health						
Ensure targeted health initiatives regarding women health, hygiene and WASH services	Number of awareness sessions					
	Number of women trained					
	Number of actions operationalized					
Research, and Knowledge Management						
Institutionalize gender-sensitive benefit-sharing mechanism	Gendered MRV mechanism to gather data developed					
	Number of case studies					
	Number of funding proposals submitted					
	Number of research and policy papers					
	SEIA integrated as part of EIA					

SDG objectives:

SDG-13 Targets	Objective	Potential indicators	Priority actions by Provinces (H,M,L)	Immediate Action/ Long term Action	Activity Cost	Timeframe	Stakeholders
13.1	Strengthen resilience and adaptive capacity to climate-related disasters	Number of capacity building initiatives undertaken for improving disaster risk mitigation and response Number of district level multi-hazard assessments in various provinces					
13.2	Integrate climate change measures into policies and planning	Integration of climate considerations in PC-I form					
13.3	Build knowledge and capacity to meet climate change	Number of climate-related studies and risk assessments undertaken					
13 A	Implement the UNFCC	Development of an action plan for implementation of NDC.					
13 B	Promote mechanisms to raise capacity for planning and management	Number of climate-related capacity development initiatives rolled out					

Figure 1 Proposed Strategic Action Plan for NDC Implementation