Government of Pakistan
Ministry of Climate Change
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Achievements of the Ministry of Climate Change

Pakistan is situated in one of the most vulnerable spots in the world in relation to susceptibility to climate change. The country though a minor contributor to the overall Green House Gas emissions, is susceptible to severe climate change effects. The expected increases in temperatures due to global warming and the geographical location already places the country in heat surplus zone of earth.

Scientists believe that climate change might take away or alter monsoon from the Indo -Pak Sub Continent. Coupled with dry erratic and intensive rains, late monsoons, dry winters, and prolonged dry spells, Pakistan will witness severe weather conditions including disasters such as floods and droughts. According to the independent international assessments, e.g. German Watch, a Germany based NGO; Pakistan is ranked among the top countries of the world most vulnerable to climate change. The back to back floods of 2010, 2011, 2012, 2013 and 2014, worst drought during 1999-2003, two cyclones in one month in Karachi/Gwader Coast in 2008 and increased incidences of landslides, GLOFs (Glacier Lake Outburst Floods) in the northern areas of Pakistan bear testimony to the ugly face of climate change.

Major Climate Change related Concerns of Pakistan

- Increased variability of Monsoon
- Projected recession of Karakorum-Himalayas Glaciers threatening Indus River Flows
- Increased risks of Extreme Events (floods, droughts, cyclones, extreme high / low temperatures etc.)
- Severe water and heat-stressed conditions in arid and semi-arid regions leading to reduced agricultural productivity
- Increase in Deforestation; Loss of Biodiversity
- Increased intrusion of saline water in the Indus delta due to sea level rise; Risk to mangroves and breeding grounds of fish
- Health Risks

Pakistan's economy and its food security are highly dependent on agriculture which in turn relies on large scale glacial reserves of water in the Karakorum, Pamir and Himalaya region. The growing population is putting pressure on land and other natural resources. Any additional pressure due to climate change will be difficult to sustain for a country like Pakistan as it has severe resource and capacity constraints. Inadequate physical and institutional infrastructure makes it impossible to cope with and timely respond to the impacts of climate change such as witnessed during natural disasters like floods and droughts.

According to the 2006 Pakistan Strategic Country Environmental Assessment Report, the annual cost of environmental degradation in Pakistan has been estimated at Rs365 billion ($4.2 billion). Environmental experts believe the annual cost of environmental degradation has now reached around Rs450 billion ($5.2 billion) in financial losses.

The country is suffering from rapid deforestation with an annual rate of 4-6 percent while carbon dioxide emissions are increasing annually at the rate of 8-10 percent. Almost 250 million gallons of untreated water is dumped into the Arabian Sea every day by residents and Industries located in Karachi which is destroying the ecosystem. Recent data indicates that over one million acres of fertile, arable land in the Indus delta has become saline and unusable, largely due to the retention of freshwater flows by large dams across the Indus River.

Devolution under 18th Amendments and creation of Ministry of Climate Change:

Pakistan launched its first National Climate Change Policy in February 2012, to cope with the threats of climate change through adaptation and mitigation measures. The 18th Amendment, however, resulted in devolution of environment as a subject to the provinces and the Ministry was abolished which slowed down the whole progress. Owing to the magnitude and recurrence of climate change related disasters, such as consecutive floods of 2010, 2011 and 2012 Ministry of Climate Change was established on 18th April 2012.The Ministry of Climate Change has been vested with the mandate to comprehensively address Disaster Management along with spearheading national climate change initiatives both in adaptation and mitigation.

Ministry of Climate Change has following attached department:

i. National Disaster Management Authority
ii. Pak EPA (with the jurisdiction to work in ICT to avoid any duplication)
iii. Zoological Survey Department (ZSD)
iv. Global Change Impact Study Center (GCISC)

Initiatives of Ministry of Climate Change during the last two years:

Ministry of Climate Change has taken many initiatives and projects with the support of donors in the area of climate change adaptation and mitigation in accordance with the Climate Change Policy 2012 which includes:

Legislative and Policy Interventions Introduced and Implemented

Framework for implementation of National Climate Change Policy (2014-2030)

Realizing the importance of the climate change issue, Ministry of Climate Change launched Framework for implementation of National Climate Change Policy (2014-2030) in November 2013.

The development of this Framework for Implementation of NCCP is a follow-up of the National Climate Change Policy (NCCP), the parent document providing broader framework concerning how to adapt to the changing impacts of climate and how to play a role in its mitigation. This Framework for Implementation of NCCP is developed keeping in view the current and future anticipated climate change threats to Pakistan's various sectors.

In view of Pakistan's high vulnerability to the adverse impacts of climate change, in particular extreme events, like the policy document adaptation effort is the focus of this Framework for Implementation of NCCP document too. The vulnerabilities of various sectors to climate change have been highlighted and appropriate adaptation actions spelled out. These cover actions to address issues in various sectors such as water, agriculture, forestry, coastal areas, biodiversity, health and other vulnerable ecosystems. Notwithstanding the fact that Pakistan's contribution to global greenhouse gas (GHG) emissions is very small, its role as a responsible member of the global community in combating climate change has been highlighted by giving due importance to mitigation efforts in sectors such as energy, forestry, transport, industries, urban planning, agriculture and livestock.

Furthermore, appropriate actions relating to disaster preparedness, capacity building, institutional strengthening; and awareness raising in relevant sectors has also been part of this document. The Framework could be used to prepare the detailed provincial and local adaptation action plans.

National Report of Pakistan for HABITAT-III

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

Climate Change Vulnerability Assessment of Islamabad

Ministry of Climate Change with UN Habitat, Capital Development Authority and ICT Administration assistance has undertaken a study "Climate Change Vulnerability Assessment of Islamabad" which was launched by Minister for Climate Change on World Environment Day (5th June, 2015). The study reveals that the city of Islamabad and its surrounding Capital territory is exposed to a host of factors accelerating climate change impacts such as erratic behavior and marked changes in the intensity, frequency and variability of temperature , precipitation, floods, draughts, cyclones etc. The extreme weather events recorded so far in Islamabad include highest maximum temperature of 46.6° C on 24th June 2005 and lowest at – 4.3° C on 25th December 1984. In 2001 heaviest rainfall of 621mm was recorded in 10 hours.

The main findings of the assessment reveal startling facts regarding erratic behavior and marked changes in the intensity, frequency and variability of temperature, precipitation, floods, draughts, cyclones etc. The study proposes a well thought out planning interventions to make Islamabad a climate resilient city. The study also makes recommendations of utilizing the present institutional arrangements for a well coordinated effective implementation of suggested plans in Islamabad.

Preparation of Pakistan's Intended Nationally Determined Contributions (INDCs):

Ministry of Climate Change has developed Pakistan's Intended Nationally Determined Contributions (INDCs) and submitted to UNFCCC Secretariat.

National Climate Change Policy Implementation Committee (NCCPIC)

In order to adopt a coherent strategy across all our provinces to deal with the climate change threats, National Climate Change Policy Implementation Committee is in place. Its first meeting was held in April, 2015. During the meeting, the provincial governments' representatives conveyed that provincial plans of action are being developed to tackle this issue in a robust fashion.

National Technology Needs Assessment (TNA) Committee

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. To steer this TNA Process, a National TNA Committee has also been constituted. The TNA process has been initiated by an Inception Workshop which was held in June, 2015.

Participation in international climate negotiations:

Ministry of Climate Change effectively participated and played active role in international climate negotiations.

Preparations for COP-21:

Government of Pakistan is the party to the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol. Conference of Parties (COP), the apex body of United Nations Framework Convention on Climate Change is assigned to promote and review the implementation of the convention's commitments. The COP of the UNFCCC comprises 195 countries/states that have ratified or acceded to the Convention and Pakistan is one of them since 1st June, 1994.

The 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change & 11th Session of the Conference of Parties serving as Meeting of the Parties to the Kyoto Protocol (COP-21/CMP-11) are scheduled to be held from 30th November to 11th December 2015 in Paris, France. The objective is to achieve a legally binding and universal agreement on climate, from all the nations of the world.

Ministry of Climate Change being focal institution for UNFCCC is in the process of finalizing elaborate arrangements for participation in the Conference for effective participation in COP-21 at an appropriate level to demonstrate the commitment of the Government of Pakistan. In this regard, a multi-stakeholder delegation comprising of officials of Federal and Provincial governments along-with Parliamentarians, members of INGOs, academia, private sector and subject experts is being formulated;

Hosting of Second Pakistan Conference on Sanitation (PACOSAN-II) & Sanitation and Water for All (SWA) Regional Consultations

Ministry of Climate Change hosted Second Pakistan Conference on Sanitation (PACOSAN-II) and Sanitation and Water for All (SWA) Regional Consultations in February, 2015. The President of Islamic Republic of Pakistan inaugurated the Conference which was attended by Federal and Provincial government's representative alongwith international and national stakeholders.

Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5)

Ministry of Climate Change participated as Lead Author in Intergovernmental Panel on climate Change's (IPCC) fifth assessment report (AR5).

Pakistan Elected as Global Co-chair of the Clean Development Mechanism Forum

Ministry of Climate Change participated in Clean Development Mechanism Forum in Nov, 2013 and Pakistan was elected as Global Co-chair of the forum.

Pakistan Elected as Member for Consultative Group of Experts (CGE)

For the first time, a member was elected from Pakistan for Consultative Group of Experts (CGE) under United Nations Framework Convention on Climate Change (UNFCCC). Furthermore, a member is also elected from Pakistan for Clean Development Mechanism (CDM) Executive Board.

13th Meeting of Governing Council of South Asia Co-operative Environment Programme (SACEP) and 5th Inter Ministerial Meeting of South Asian Seas Programme (SASP)

Successfully conducted 13th Meeting of Governing Council of South Asia Co-operative Environment Programme (SACEP) and 5th Inter Ministerial Meeting of South Asian Seas Programme (SASP) on 3-5 December, 2013 at Islamabad.

SAARC Workshop on Climate Change Impacts on Coastal and Aquatic Resources

Workshop on Climate Change Impacts on Coastal and Aquatic Resources was conducted on 26-28 December, 2013 in Karachi. The purpose of the workshop was to integrate individuals and institutions of SAARC Member Countries by bringing together the expertise on to a single platform to deliberate upon Climate change Impacts on Natural aquatic resources.

SAARC Workshop on Bio-invasion and Ballast Water Management

SAARC Workshop on Bio-invasion and Ballast Water Management was conducted from 25-27 August 2014 at Karachi in collaboration with SAARC Coastal Zone Management Centre. The purpose of the workshop was to integrate individuals and institutions of SAARC member countries by bringing together the expertise on to a single platform to deliberate on the impacts and management of Ballast Water Discharge in the coastal areas

Pakistan is a member of regional initiative on Mangroves for the Future (MFF) programme along with other 11 countries since 2010. Ministry of Climate Change during 2014 under this initiative in collaboration with IUCN-Pakistan has enhanced capacity of coastal communities to ensure sustainable use of fisheries and mangrove resources. In this regard during the period, various trainings and demonstration activities have been carried out.

To ensure effective implementation of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) in Pakistan an exclusive law entitled "The Pakistan Trade Control of Wild Fauna and Flora Act, 2012" has been enacted. In October 2014, a CITES Management Authority of Pakistan under the Chairmanship of Federal Minister for Climate Change was notified to facilitate wildlife trade to strengthen the National economy and to facilitate local communities to conserve big game under trophy hunting of Markhor, Ibex, Urial.

During 2013, Pakistan became member of World Bank's Forest Carbon Partnership Facility (FCPF). The FCPF supports developing countries in implementing Reduced Emission from Deforestation and forest Degradation (REDD+) under the UN Framework Convention on Climate Change. In December, 2013 FCPF approved project to provide USD 3.8 million through World Bank for implementation of Pakistan's REDD+ Readiness activities. After fulfilling all codal formalities this project recently started its operations. The grant for REDD+ readiness will be utilized in next 3-4 years for preparation of national REDD+ strategy, national forest monitoring system, and a system of economic, social and environmental safeguards to implement REDD+. The training imparted in the preparatory phase will enable forest dependent communities to receive performance based payments.

Major Projects Initiated and Completed During the Period

1. **Clean Development Mechanism (CDM) Project**

Under CDM Project, following activities have been carried out:

- Ministry of Climate Change as Designated National Authority (DNA) has granted host country approval of 71 CDM Project, out of which 38 projects are registered with CDM Executive

Board, Germany. From these registered 38 CDM Projects Greenhouse Gases (GHGs) Emission Reductions per year is 4.91 Mt of CO2 eq. and total GHG emission reductions over crediting period is 91.17 Mt of CO2 eq. Similarly the revenue by selling of CERs from these 38 registered projects per year is US$ 61.3 Million and total Revenue by selling CERs from these projects over crediting period is US$ 1.13 Billion to Pakistan. Out of 38 Registered CDM Projects 7 are starting earning CERs of 4.198 Million so far. Currently 92 CDM projects are in Pipeline for assessment, evaluation and processing for grant of Host Country approval.

- CDM Cell has organized 75 CDM awareness raising and capacity building events for promotion and enhancement of CDM Projects in the country.
- Ministry of Climate Change has submitted Seven (7) NAMAs after detail technically review and assessment to UK/German Facility which will provide basis for reduction of 12.16 million tons of Greenhouse Gases (GHGs) per years with number of other co-benefits like technology transfer, International financial assistance, capacity building, foreign investment, cleaner sources of energy production which get rid of energy crises situation, poverty alleviation through additional creation of employment generation, improvement of local and global environment protection by reduction of GHGs for national sustainable development of Pakistan.

Events organized by CDM Cell in last two years:

(a) CDM Review committee meeting CRC for grant of HCA in committee room of Climate Change Division on , Islamabad on 14th February 2013

(b) Organized 5 days training for CDM Assessment of PC-I of Public Sector Projects from 16th of 20th June 2014, by CDM Cell in collaboration with Pakistan Planning and Management Institute.

(c) Organized training for planning of sustainable urban transport Systems in Pakistan: Opportunities for carbon financing in collaboration with IUCN & PAKSTRAN project in Karachi from 30th Sep to 3 Oct 2014.

(d) National Consultative workshop on COP-20 at Hill view hotel, Islamabad on 19th Nov 2014

(e) CDM Review committee meeting CRC for grant of HCA in committee room of Climate Change Division on , Islamabad on 20th Nov 2014

2. <u>Sustainable Land Management Project (SLMP) – Phase-I</u>

Ministry of Climate Change is implementing Sustainable Land Management Programme (SLMP) to Combat Desertification in Pakistan. The SLMP is being implemented in two phases and designed to implement United Nations Convention to Combat Desertification (UNCCD) and National Action Programme (NAP) to combat desertification and mitigate impacts of drought in Pakistan in collaboration with provincial Planning and Development Departments. The Pilot Phase of the project concluded in May 2014, which was jointly funded by the GEF, UNDP, and GOP with total cost of <u>Rs.238.805 million</u>, including grant of Rs.200 million (US$3.5 million) from the GEF and UNDP.The major achievements of the Pilot Phase included: rehabilitation of over 14,000 hectares of degraded rangelands through reseeding and introducing community-based rest-rotation grazing management system. Around 10,000 hectares of land have been brought under sustainable rain-fed agriculture and improved soil and water conservation measures have been introduced at the local level. The Up-scaling Phase of the SLMP has recently been approved by the CDWP. It will be funded jointly by the Provinces, GoP, UNDP, GEF, GM-UNCCD and local communities with total investment of <u>Rs.1666.695 million</u>, including grant of Rs.414.0 million (US$3.916 million) from GEF, Rs.160.8

(US$1.525) from UNDP, Rs.13.7 (US$0.13) from GM-UNCCD, whereas the GoP, Provinces and communities share will be Rs.105.43, Rs.733.42, and Rs.239.43 million, respectively.

3. Global Environment Facility (GEF) funded projects:

The Global Environment Facility (GEF) is a global partnership among 183 countries, with its Secretariat based in Washington DC (USA). The GEF is the designated financial mechanism for a number of Multilateral Environmental Agreements (MEAs) or Conventions. It assists countries in meeting their obligations under the conventions that they have signed and ratified. The guiding conventions for GEF are:

- Convention on Biological Diversity (CBD)
- United Nations Framework Convention on Climate Change (UNFCCC)
- Stockholm Convention on Persistent Organic Pollutants (POPs)
- UN Convention to Combat Desertification (UNCCD)

4. 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 to and releases of POPs;

iii. Collection, transport and disposal of 300t to PCB and 1200t 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 BAT/BEP. As an alternative, the project will however keep open the option of shipment of POPs waste abroad for disposal, in compliance with the Basel Convention, if at an early stage if results show that the POPs cannot be disposed of using the technologies available in the country.

The Project started in July, 2015. The Steering Committee of the project has been constituted and its 1st meeting was held on 29.09.2015.

5. Climate Finance Unit (CFU) - Pakistan

GEF Cell has been renamed as Climate Finance Unit (CFU) which works under the direct supervision of GEF Focal Point as the dedicated office to coordinate with relevant stakeholders and facilitate GEF Focal Point in looking after GEF related matters at national level. GEF has carried out following projects during the last two years:

i) 5th Operational Phase of the GEF Small Grants Programme for sustainable livelihoods while generating global benefits in terms of biodiversity conservation, reduced greenhouse gas emissions and increased carbon storage.
ii) Sustainable Energy Initiative for Industries in Pakistan
iii) GEF UNIDO CleantechProgramme for SME's in Pakistan
iv) Conservation and Management of Pollinators for Sustainable Agriculture through an Ecosystem Approach
v) Mountains and Markets: Biodiversity and Business in Northern Pakistan

vi) Barrier Removal to the Cost-Effective Development and Implementation of Energy Standards and Labeling Project
vii) Pakistan Sustainable Transport Project
viii) Promoting Sustainable Energy Production and Use from Biomass in Pakistan
ix) Development and Application of Decision-support Tools to Conserve and Sustainably use Genetic Diversity in Indigenous Livestock and Wild Relatives
x) Promotion of Energy Efficient Cooking, Heating and Housing Technologies (PEECH)
xi) Sustainable forest management to secure multiple benefits in Pakistan's high conservation value forests (GEF-UNDP-SFM Project)

6. Glacial Lake Outburst Floods (GLOF) Project:

For the past ten years, climate change induced disasters have taken momentum in the valley, particularly the floods caused by glacial lakes. These glacial lake outburst floods (GLOF) occur when the ice walls containing the reservoir fail, sending entire lakes down to inhabited areas below. During such emergencies, there is severe loss of lives and physical assets. Pakistan GLOF Project was launched in2011 and intended to complete in 2015.

Following are the two main objectives of the project:

- To develop the human and technical capacity of public institutions to understand and address immediate GLOF risks for vulnerable communities in Northern Pakistan
- To enable vulnerable local communities in Northern Pakistan to better understand and respond to GLOF risks and thereby adapt to growing climate change pressures

7. Mangroves for the Future (MFF)

The MFF is a unique regional multi-partner initiative for healthy coasts, ecosystems and coastal communities in the Indian Ocean with the prime objective of protecting coastal mangroves forests as natural barriers against disasters like Tsunamis. Pakistan is a member of the MFF and International Union for Conservation of Nature (IUCN) is the implementing agency for Pakistan. Ministry of Climate Change in collaboration with MFF stakeholders has prepared "MFF National Strategy and Action Plan". Presently MFF is sponsoring five small grant project upto USD 25000, under its small Grant Facility.

International Cooperation in the field of Climate Change:

Ministry of Climate Change is ensuring compliance of International Conventions and Protocols that it has acceded to or ratified. The Ministry also processed MOUs to be signed with Ministry of Environment, Republic of Korea on cooperation for environmental protection in the light of new development strategy of the Government of Republic of Korea for low carbon green growth in order to reduce greenhouse gas emissions. Similarly in order to enhance cooperation between Turkey and Pakistan, a bilateral "Cooperation Protocol" was signed on 24th December, 2013 on Disaster Management during the Turkish Prime Minister's visit to Pakistan from 23-24 December, 2013. All codal formalities for signing of an agreement between Pakistan and Sri Lanka in the field of Disaster Management have been completed.

Following agreements and MOUs have been signed and projects prepared by the Ministry of Climate Change in the last two years:

i. Minamata Convention on Mercury on 10th October, 2013 at Kumamoto, Japan.

ii. MOU on the project titled "Environmentally Sound Management of Waste from Ship Recycling in Pakistan" with the Secretariat of Basel, Rotterdam and Stockholm Conventions, Geneva, Switzerland on 25-04-2014.
iii. Project Cooperation Agreement titled "Review and Update of the National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs) in Pakistan" with the United Nation Environment Programme (UNEP) on 04-09-2014.
iv. Prepared a project document with United Nation Development Programme (UNDP) in May, 2014 for full scale project on "Comprehensive Reduction and Elimination of Persistent Organic Pollutants in Pakistan".
v. The project titled "Environmentally Safe Recycling and Disposal of Electronic Waste in Pakistan" was approved for a GEF grant of US$ 10 million from Global Environment Facility (GEF) by National Steering Committee.
vi. The project titled "Environmentally Sustainable Management of Chemicals and E-Waste in Pakistan" was approved for a GEF grant of US$ 02 million from Global Environment Facility (GEF) by National Steering Committee.
vii. Ministry of Climate Change, Government of Pakistan signed MOU on the project titled "Environmentally Sound Management of Waste from Ship Recycling in Pakistan" with the Secretariat of Basel, Rotterdam and Stockholm Conventions, Geneva, Switzerland on 25th April, 2014.
viii. Ministry of Climate Change, Government of Pakistan with the collaboration of United Nation Development Programme (UNDP) prepared a project document in May, 2014 for full scale project on "Comprehensive Reduction and Elimination of Persistent Organic Pollutants (POPs) in Pakistan".
ix. The project titled "Environmentally Safe Recycling and Disposal of Electronic Waste in Pakistan" was approved for a GEF grant of US$ 10 million from Global Environment Facility (GEF) by National Steering Committee.
x. The project titled "Environmentally Sustainable Management of Chemicals and E-Waste in Pakistan" was approved for a GEF grant of US$ 02 million from Global Environment Facility (GEF) by National Steering Committee.
xi. Five Hydrochlorofolorocarbons (HCFCs) based industries (i.e M/s Dawalance, M/s United Refrigeration Industries Ltd., M/s Haier, M/s Varioline Intercool and M/s Shadman Electronics) have been converted into Ozone friendly industries.

Montreal Protocol Project (Ozone Cell)

Montreal Protocol on the Substances that Deplete the Ozone Layer was signed at Montreal, Canada, in 1987. Pakistan ratified the Montreal Protocol in 1992. The Ozone Cell was established under the devolved Ministry of Environment in 1996 to oversee the implementation of the Protocol.

Project Performance

The project is an important institutional arrangement to implement and coordinate ozone depleting substances (ODSs) phase out programmes / projects in Pakistan. Ozone Cell achieved all major targets for 2014-15.

Pakistan fully complies with regard to the implementation of Montreal Protocol in import and consumption. After setting the baseline for the import of HCFCs in Pakistan, the Ozone Cell is on its way to phase out the HCFC from Pakistan as per the set targets of Montreal Protocol. In this context, Ozone Cell has achieved the 10% reduction targets of HCFCs on 1st January, 2015. For maintaining the effective phase out process the import of HCFCs are monitored on monthly basis and viable mechanism has been developed in collaboration with custom authorities to restrict the illegal trade of

ODS. This reflects the country's commitment for the preservation of the ozone layer for sustained life on earth and as well as for generations to come.

PERFORMANCE OF THE ATTACHED DEPARTMENTS OF MINISTRY OF CLIMATE CHANGE:

Global Change Impact Studies Centre (GCISC):

Being cognizant of the fact that Climate change is a stark reality and no more a fiction and Pakistan cannot remain secluded from the adverse impacts of this global concern, Global Change Impact Studies Centre (GCISC) was established as a dedicated research Centre to climate change issues in 2002 as a PSDP Project. Consequently GCISC was granted the status of a regular national entity as a body corporate by passage of "GCISC Act 2013". According to the act, the Centre is a body corporate working under Ministry of Climate Change, Government of Pakistan as its research arm with the following functions:

- ***Research:*** on climate change profiles of Pakistan, CC impact assessment in different socio-economic sectors and identification of appropriate adaptation/mitigation strategies;

- ***Capacity building:*** of young scientists of GCISC and the relevant national research organizations in climate change research;

- ***Dissemination of research findings:*** to scientific community, planners, policymakers and raising public awareness of climate change concerns.

GCISC with the Public Welfare and Facilitation Interface

Since GCISC is a public sector organization mandated to carry out the functions of research, capacity building and public awareness in the area of climate change and associated impacts on the various sectors national socio-economic development, all of the Centre's activities are meant for public welfare and facilitation at large.

As per mandate the Centre is actively pursuing its Research Activities in the areas of climatology, Water Resources and Agriculture through use of simulation modeling techniques by:

- Assessing past climate changes in various parts of Pakistan using statistical analysis techniques;
- Projection of future climate changes in Pakistan based on: (a) Ensemble of projections using the outputs of various Global Circulation Models (GCMs) (b) Statistical and dynamical downscaling using regional climate models (RCMs).
- Development of indicators and indices for extreme climate events in the South-Asia region; Development of methodological tools for projecting future frequency & intensity patterns of extreme events;
- Development of seasonal, inter-annual and decadal climate predictability systems; Predictability of Asian Summer Monsoon rains.
- Updating of GHG Inventory of Pakistan using latest IPCC guidelines.
- Quantitative assessment of past temporal changes in the dimensions of HKH glaciers using advanced Remote Sensing (RS) and GIS techniques;
- Monitoring of snow cover and glacier behavior in the HKH region; using RS/GIS techniques;
- Assessment of the impacts of projected climate change on water flows in the main rivers of Pakistan using different Watershed Simulation Models;

- Assessment of the impacts of projected climate change on productivity, crop water demand and net irrigation requirements of various agricultural crops in different climatic zones of the country;
- Food security in the wake of climate change and reduced availability of irrigation water;
- Adaptation measures to counter negative impacts of climate change on Agriculture

The scientific achievements of past two years (2013-14 & 2014-15) of the Centre are as follows:

Publications:

International Papers	:	19
National Papers	:	3
Research Reports	:	7

Scientific Activities Organized by GCISC: 7

Scientific Contributions/ Presentations

International	:	22
National	:	18

Participation of GCISC Scientists in Scientific Conferences, Workshops. Seminars etc.:

International	:	26
National	:	118

The details are given at Annex-I.

Major contributions to International/ National Efforts (IPCC, GEO & Other):

1. One GCISC Scientist contributed as Lead Author to a chapter of WG-II report whereas Several GCISC Scientists contributed as Expert Reviewers for WG-I, WG-II and WG-III Reports of IPCC 5th Assessment Report (AR-5)
2. Five GCISC Scientists are contributing as "Lead Authors" to various chapters of UNEP Global Environment Outlook (GEO-6) Asia and Pacific Component
3. A Research Article "Elevation-dependent Warming in Mountain Regions of the World**"**, Published in NATURE CLIMATE CHANGE, May 2015 Issue, (by Dr. M. Zia Ur Rahman Hashmi of Water Resources Section with 20 other authors from different countries)

Environmental Protection Agency (PAK-EPA):

Pakistan Environmental Protection Agency (Pak-EPA) was established under section (5) of Pakistan Environmental Protection Act, (PEPA) 1997. Basic functions of Pak-EPA are to enforce the PEPA-1997 rules & regulations, approve Environmental Impact Assessment (EIA), Initial Environmental Examination (IEE) issues certificates for establishment of environment labs in the Islamabad Capital Territory. During the last two years, Pak EPA carried out following activities:

Pakistan Environmental Protection Agency (Pak-EPA) being the apex agency entrusted the task to implement Pakistan Environmental Protection Act' 1997 (PEPA'97) remained cognizant of these challenges and has always given high priority to ensure compliance of PEPA'97. Some of the major interventions introduced and implemented during the last two years:

Legislative and Policy interventions introduced and implemented;

- Pakistan Environmental Protection Act, 1997 draft Amendment Bill 2015 has been prepared.

- Prohibition of Non-Degradable Plastic Products (Manufacturing, Sales and Usage (Amendment) Regulation 2015 have been notified.
- Registration of criteria and procedure for Environmental Consultants, drafted.
- Compounding of Offences and payment of Administrative Penalty Rules, 2015 has been notified.
- Prohibition of Non-Degradable Plastic Products (Manufacturing, Sales and Usage (Amendment) Regulation 2013 has been notified.
- Initial Environment Examination (IEE)/Environmental Impact Assessment (EIA) rules have been drafted and sent to Ministry of Law for vetting.
- Pakistan Bio-safety Bill and Ordinance 2015 have been drafted.
- Clean Environment Fund has been established under section 42 of the companies ordinance 1984 for the protection, conservation and rehabilitation of environment in the federal capital.

Major Projects initiated and completed during the period;

Establishment of Geomaetic Centre Project was started w.e.f. 01st July, 2013 with capital cost of Rs.48.885 million and amount of Rs.12.00 million allocated for the year 2013-14. An MOU has been signed between Pakistan Environmental Protection Agency (Pak-EPA) and Pakistan Space & Upper atmosphere Research Commission (SUPARCO). SUPARCO would assist Pak-EPA in establishment of Geomatic Centre, which would utilize data gathered during National Environmental Information Management System (NEIMS) Project and recommend bilateral frame work between Pak-EPA and SUPARCO and to promote joint project activities of mutual interest in accordance with their respective needs and objectives and shall, by joint agreement, determine the areas and subject of such cooperation, on the basis of the understanding contained in this MoU. Geomatic Centre has been established at Pak-EPA and SUPARCO is assisting in the field of Environmental Monitoring and mapping services etc. The project objectives and scope are as under

- Setting up of spatial referenced data collection, processing and exchanging harmonized framework according to the needs of all users working in the area relevant to atmospheric sciences, irrigation, agriculture, forestry, geology, lakes, marine resources, and urban infrastructure for socio-economic development projects;

- Promote application of Geographic Information System (GIS), Spatial Reference System (SRS) and Global Positioning System (GPS) technologies in assessing existing situation of forest, desertification, soil, climate, environmental pollution, marine life, coastal areas, snow and glacier, disasters, hazards, biodiversity, water resources, ecological zones;

- Provide guidance, avoiding duplication and optimizing the use of national resources for the betterment of environment;
- Enhance and upgrade institutional capacity Pak EPA, Ministry of Climate Change in the use of SRS, GIS and GPS for environmental monitoring and management;
- Support the Ministry of Climate Change and Planning Commission to generate predictive tools for environmental planning and management in combination with normal remote sensing and GIS tools;
- Facilitate Federal and provincial governments in disaster risk reduction through vulnerability mapping, information clearing house mechanism and training to use latest available technologies for risk assessment from various forms of hazards;

Zoological Survey Department (ZSP)

Studies and surveys undertaken by ZSP during the last two years:

a. Animal data collection of protected areas in collaboration with provincial wildlife departments for scientific management of resources

During the period ZSP has undertaken faunal survey of two protected areas including i) Machiara national park, AJK and ii) ChumbiSurla wildlife sanctuary, Punjab with the participation of the provincial wildlife departments. Conservation oriented studies of Endangered and Threatened species for Trophy-hunting Programme. The survey is likely to be used in conservation of local fauna and social uplift of the local communities.

b. **Studies on Ungulates for trophy hunting programme**

Pakistan's most successful trophy hunting programme has not only ensured the sustainability of the game species like Markhor, Urial, Ibex and Blue sheep that were on the verge of extinction only few years ago. This programme also have a role in social uplift of the local communities. ZSP had conducted studies on ungulate species including Suleiman Markhor, Afghan Urial and Himalayan Ibex in the province of Balochistan and AJK with the involvement of local communities and provided outcome of these studies to the authorities to facilitate in allocation of trophy hunting quota to the provinces and conservation communities. The estimated earnings of approximate 2.0 million USD through this program were spent on different social development plans including health and education during last two years.

c. Recommendation to the Government for National Trade Policy on wildlife species and their products.

ZSP is mandated to provide data and recommend quota on regular basis to the Office of Conservator Wildlife, Ministry of Climate Change in the context of national trade policy to regulate international trade in wild animals and birds. In this regard survey reports prepared on target species facilitate the authority.

Pakistan Environmental Planning and Architectural Consultants (PEPAC)

Pakistan Environmental Planning and Architectural Consultant Limited (PEPAC) was incorporated in 1974 to provide town planning and architectural consultancy services for projects initiated by the Government, Semi Government and autonomous bodies. The company is managed by a Board comprising 16 Directors including the Chairman, all nominated by the Government. The authorized capital of the company is Rs.2.50 million, divided into 250,000 share of Rs.10 each). The paid up capital of the company, which is wholly owned by the Federal Government is Rs.1.10 million.

Activities / Achievements

Projects in Hand during the Financial Year 2013 – 2014 & 2014 - 2015

Architectural & Engineering Projects

- Establishment of Medical College and 300 Bedded Hospital at Gilgit-Baltistan
- Establishment of 200 Bedded Cardiac Hospital at Gilgit-Baltistan
- Punjab Worker Welfare Complex adjacent to Sunder Industrial Estate District Kasur (PWWB)
- Approx 15 Health & Educational Projects with C&W Department, Khyber PakhtunKhwa
- Office Building for National Electronic Complex (NECOP) in H-9, Islamabad
- Khyber Institute of Children Hospital at Hayatabad, Peshawar
- Strengthening of King Edward Medical University, Lahore
- Preparation of Urban Laws for Government of Khyber PakhtunKhwa

- Slum Study in Urban Areas at 5 cities of Khyber PakhtunKhwa
- District Headquarter Hospital at Tarlai, Islamabad
- Secretariat Mosque, Islamabad
- Ancillary Departmental Block of District Head Quarter Hospital at Shangla, Khyber PakhtunKhwa
- King Abdullah Teaching (DHQ) Hospital at Mansehra, Khyber PakhtunKhwa (SFD Funded)
- Islamic Development Bank/Saudi Funded Projects (17 Nos.) in Khyber PakhtunKhwa
- Construction of Judicial Complex at Haripur with C&W Department, Khyber PakhtunKhwa

National Disaster Management Authority (NDMA)

During the last two years, landmarks achieved by NDMA in the field of disaster management are covered in following Paras.

1. Policies, Plans and Manuals.

a. National Disaster Risk Reduction Policy (2013).
b. National Disaster Management Plan (NDMP-2013-22).
c. Monsoon Contingency Plans for years 2013 & 2014.
d. National Monsoon Contingency Response Directive 2015.
e. National Contingency Plan for Industrial / Technical Disasters.
f. Standing Operation Procedures in Emergencies (Urdu).
g. Nuclear Emergency Management (NEMs).
h. National Policy Guidelines on Vulnerable Groups in Disaster (Aged, Disabled, Women, Children).
i. National Gender & Child Cell Framework (2013).
j. Child Protection Manual during Disaster
k. Training Manual on Gender Mainstreaming in Disaster, 2014.
l. Multi Sector Initial Rapid Assessment (MIRA) Module Version developed and implemented in Floods of 2014 for assessment
m. Recovery Need Assessment (RNA) Module Draft version developed
n. Process initiated for repeal of Natural Calamities Act 1958 to do away with duplicity of laws.
o. Drought Mitigation and Response Plan (2015).
p. SOPs on separate unaccompanied and missing children during disasters
q. Revision of National Disaster Response Plan

2. Disaster Risk Reduction. Apart from above-mentioned polices, plans and manuals, NDMA has also been able to achieve following in the field of Disaster Risk Reduction:-

a. Report on Gender, Climate Change & Disasters (2014).
b. Causes and Prevalence of Early and Forced Marriages in Disasters (2014).
c. Proposal on Establishment of SAARC Environment & Disaster Management Centre in Pakistan (2015).
d. Study on the Impacts and Future Line of Action Relating to Recent, June 2015 Heat wave in Karachi, Sindh (2015).
e. Demand Study on Disaster Risk Insurance
f. Initiation of work on Draft National Fire & Life Safety Code.

3. Relief Assistance During Disasters

a. **Pakistan.** Details of relief assistance (province/region and year wise) provided at Appendix I.

b. **Overseas Assistance.** Overseas relief assistance provided to Afghanistan, Bosnia and Nepal with net financial value **Rs. 215.16 million** during the last two years and total **108.22 tons** goods transported.

4. **Capacity Building**. National Institute of Disaster Management (NIDM) made functional on adhoc basis with the funding of UNDP as well as support funding of NDMA. The institute has been able to train about **2994** persons from Government and private sector in 86 courses so far since its activation in 2013.

5. **Measures – Strengthening of Response Mechanism**

a. **Launching of Canadian Bridges.** Following the floods of 2010, Canadian Government provided 28 bridges for flood affected areas. In 2013, NDMA successfully coordinated with Provincial Governments and Pakistan Army for the launching of 5 bridges in Khyber Pakhtunkhwa, 4 bridges in AJ&K and Gilgit Baltistan. In 2013, NDMA coordinated and diverted 3 bridges planned for Skardu, Ghanche and Pune and 2 bridges from storage as temporary arrangements for Mushkin, Gilgit Baltistan where an already existing bridge was damaged and there was a danger of 0.15 million population being cut off in Astore Valley. This timely intervention averted an impending disaster in Astore Valley and helped in bringing back normalcy.

b. **Strengthening / Enhancing Human Resource Capacities.** In 2013, NDMA embarked upon a capacity building program in collaboration with UNOCHA and respective provincial PDMAs for authorities of vulnerable districts. These trainings are aimed at enhancing the response capacities of districts and provincial administration and increase their understanding about humanitarian issues. So far 29 trainings have been conducted in two phases. A total of 1,092 government officials have been training in both phases of this program. Third phase is planned in November this year.

c. **Establishment of Urban Search and Rescue (USAR) Teams and Programme for Enhancement of Emergency Response (PEER) Program.** Rescue team was established at Mardan. This is apart from USAR Teams already established with one each for Capital Development Authority, City District Government Karachi, Chitral, Gilgit-Baltistan. Pakistan Programme for Enhancement of Emergency Response (PEER) was undertaken with the objective to train emergency responders in the following disciplines:-

(1) Community Action for Disaster Response (CADRE) Course (149 Officials Trained).

(2) Hospital Preparedness for Emergencies (HOPE) Course (144 Officials Trained).

(3) Medical First Responder (MFR) Course (257 Officials Trained).

(4) Collapsed Structure Search and Rescue (CSSR) Course (188 Officials Trained).

d. **Supply Chain Management.** In 2013, NDMA established an effective mechanism of supply chain management, engaging suppliers at one end and delivering the relief goods at the other. The transportation, communication and monitoring of logistic operations were adequately institutionalized. The supply chain mechanism ensured a continuous provision of life saving relief items procured by NDMA from the Utility Stores Corporation (USC) and its timely, swift, transparent and efficient delivery through previously short listed transporters and NLC.

e. **Stockpiling.** Stockpiling is one of the major functions of DM institutions in the country. While the PDMAs manage their own stockpile keeping in view their expected needs, NDMA builds up strategic reserves at the national level to cope with any unforeseen event. To this end NDMA has successfully built up its socks to respond to any disaster in a timely and befitting manner.

f. **Construction of Strategic Warehouses / Shifting of Stocks.** In order to augment the logistics capacities, NDMA managed to mobilize resources through WFP for establishing strategic warehouses at various part of the country to house food and nonfood items (shelters, blankets, mats, mosquito nets). Each ware house complex has number of sheds, administered in building boundary wall and backup generator. These warehouses would ensure effective disaster response by way for up-scaling preparedness level with respect to stocking piling of a range of emergency relief goods. This would facilitate field coordination and easy access to the disaster prone communities. The details are as under:

Ser	Location	Status
(1)	Lahore	Completed
(2)	Muzaffargarh	Completed
(3)	Peshawar	Completed
(4)	Quetta	Completed
(5)	Hyderabad	Completed
(6)	Sukkur	Under Process
(7)	Gilgit	Will be started subject to availability of funds
(8)	Muzafarabad	Will be started subject to availability of funds
(9)	Islamabad	Will be started subject to availability of funds

To enhance further the storage / logistic capacities of districts, 47 Flospans have been installed / constructed in different districts. Shifting of stocks to strategic locations like Kashmore has also been undertaken thereby enhancing the response capacity.

g. **Disaster Management Simulation Exercise Punjab 2014.** A simulation training and exercise was conducted by NDMA with the help of WFP, as a pilot project for 3 districts of Punjab. This exercise was instrumental in enhancing the capacity of different stakeholders and helping them in understanding and practicing various aspects of disaster management like early warning planning / coordination / managing responses for urban relocation, camp management, logistics needs and damage assessment.

h. **Reconstruction – Post Flood 2010.** In 2013, NDMA coordinated re-construction of houses for affectees in Floods 2010 through TOKI / Syiakalam (Turkey) and Iran Housing Foundation.

i. Disaster Management Simulation Exercise Country wide 2015.

k. Capacity building of Provinces through provisions of rescue and relief items.

l. Training of Govt officials in Disaster Management through Capacity Building Programs conducted in collaboration with UNOCHA.

6. **DRR Related Activities**. NDMA also successfully represented Pakistan in following activities related to Disaster Management:-

a. **International Activities**

(1) 6th Asian Ministerial Conference on DRR, June 2014, Thailand.
(2) 3rd World Conference on DRR, March 2015, Sendai, Japan.
(3) 11th Regional Consultative Committee Meeting on DRR, April, 2014.
(4) 12th Regional Consultative Committee Meeting on DRR, June, 2015 Bhutan.
(5) International Conference on Sharing Experiences and Developing Regional Hazard & Risk Picture, May 2014.
(6) 1st Meeting of Regional Technical Group for DM-CBM's September, 2012.
(7) 3rd Meeting of Regional Technical Group for DM-CBM, May 2014.

b. **National Activities**

(1) National Consultation on Pakistan's input for Post HFA-2015 (April, 2013).

(2) 2nd Working Session of the National Working Group on Vulnerability & Risk Assessment, April, 2014.
(3) National Consultation on DRR Forum Strategy 2014-2018.
(4) Gender Thematic Group Consultation – May, 2014.
(5) DRR Sessions with Women specific vulnerable groups in hazard prone areas (Lai Nullah Rawalpindi, Rashun area in Chitral, Nowshera in KP etc).
(6) National Pre 3WCDRR Consultations on Post HFA-2015 February, 2015.
(7) Post Sendai Framework debriefing with National & Provincial Govt Stake holders, April, 2015.
(8) Revision process of SOPs for Mangla Dam Operation during floods.
(9) Disaster Risk Insurance concept for Pakistan and Demand Study on Disaster Risk Insurance.
(10) Pakistan's input for Protocol on Climate Change CCoP-20, Peru, Lima.

7. **Ongoing Undertakings of NDMA**. NDMA is continuing its endeavors to make Pakistan more resilient to face disaster through series of activities and initiatives as under:-

a. **Preparedness**
(1) Review of National Disaster Response Plan; Completion Dec 2015.
(2) Development of Regional Based Warehouses in collaboration with WFP of Sukkur, Muzaffarabad, Gilgit in country wide ware houses.
(3) Enhancement of stocking levels of relief items to support 300,000 persons at National level.

b. **Disaster Risk Reduction**
(1) Strengthening Community Resilience Project in coordination with UNDP.
(2) Self Execution of a Project on Multiple Hazard Vulnerability & Risk Assessment of 5 Districts in coordination with WFP; Completion March, 2016.
(3) Development of National Disaster Data Platform through a National Working Group comprising 26 stakeholders.
(4) Negotiation of Disaster Management Capacity Project with JICA.
(5) Monitoring of implementation NDMP.
(6) Development of GIS Based Disaster database and Strengthening of Coordination Mechanism with SUPARCO, Survey of Pakistan, Pakistan Bureau Statistics and other concerned agencies.
(7) Formulation of National Policy Guidelines on Vulnerable Groups (Women, Children, Aged & Disabled) during disaster and its parallel advocacy/awareness amongst all stakeholders.
(8) Assisting PMD to acquire Medium Range Forecasting Products from European Center for Medium Range Weather Forecasting (ECMWF) for Monsoon 2015 which may significantly enhance Medium Range Forecasting Capability of PMD.

c. **Projects.** NDMA is also collaborating with various international and national organizations to reduce the vulnerability of various parts of Pakistan, which include following:-
(1) DFID
(2) WFP
(3) UN Women
(4) UNICEF
(5) Baseline data collection project with World Bank.
(6) Multi-hazard Vulnerability & Risk Assessment in five districts of Sindh.
(7) Multi-hazard Risk Assessment of Islamabad Capital Territory.
(8) Japan Assisted Technical Cooperation Program on Strengthening Pakistan's Disaster Management System.

(9) Specialized Medium Range Forecasting Centers for PMD under Japanese Grant.

(10) Establishment of new weather radar for Karachi.

8. **Bilateral & Regional Linkages**. NDMA has been instrumental in extending and strengthening Pakistan's diplomatic outreach through establishment of various bilateral and multilateral linkages, which include:-

a. **Bilateral Linkages**

Ser	Country	Status
1.	Turkey	Signed in December, 2013
2.	Sri Lanka	Signed in April 2015
3.	Kyrgyz Republic	Signed in May 2015
4.	Cuba	Under Process
5.	Kazakhstan	Under Process
6.	Afghanistan	Under Process

b. **Regional Linkages**

(1) **Regional Consultative Committee on Disaster Management (RCC).** Pakistan has expressed its interest of holding 13th RCC meeting in collaboration with MoFA and ADPC

(2) **Heart of Asia Istanbul Process (HOA, DM-CBM).** 3rd Meeting of RTG was held on 14th May, 2014 in Islamabad.

(3) **SAARC Disaster Management Center (SDMC).** Pakistan has offered to host SAARC Environment & Disaster Management Center (SEDMC) with the merger of existing SAARC Meteorological Research Center, SAARC Forestry Center, SAARC Coastal Zone Management Center and SDMC.

(4) **Organization of Islamic Countries (OIC).** Encouraging OIC for getting a lead role of Pakistan on Disaster Management amongst Muslim Countries.

9. **Pakistan's Progress on Hyogo Framework for Action (HFA).** Pakistan is signatory of HFA which is a UN sponsored international Framework, which lays down binding on all states for compliance of measures in Disaster Risk Reduction in the defined priority areas. It was signed by 168 Member States in 2005 and its time period was from 2005 to 2015. It has now been replaced by Sendai Framework for Disaster Risk Reduction (2015 – 2030). The significant progress of Pakistan on HFA upto 31 July, 2015 is as under:-

a. **Priority Action 1**. Ensure DRR – A National and a Local priority with a strong Institutional basis for implementation. Following action done:-

(1) National Disaster Management Act, 2010 promulgated.

(2) Institutional set-up for disaster management from national to local level is in place.

(3) National Disaster Risk Management Framework (NDMRF) formulated.

(4) National DRR Policy formulated in 2013.

(5) National Disaster Management Plan (2013-2022) formulated.

(6) National Disaster Management Funds established.

(7) National Institute of Disaster Management is functional since 2012.

b. **Priority Action 2.** Identify, Assess and Monitor Disaster Risks and Enhance Early Warning. Following Action done:-

(1) National Working Group on Hazard & Risk Assessments established.

(2) Macro Level Risk Assessment of the whole Country completed.

(3) Selective Multi Hazard Vulnerability Risk Assessments (MHVRA) completed in five districts of Sindh.

(4) Upgradation of 4 Weather Forecasting Radars facilitated.

(5) Installation of Automatic Weather Stations (AWS) facilitated.

(6) Monitoring & dissemination of Early Warning enhanced.

(7) Flood Forecasting & Warning System at Leh Nullah & Kalpani Nullah.
(8) Tsunami Early Warning System installed at Karachi.

c. **Priority Action 3.** Use knowledge, Innovation and Education to build a Culture of Safety and Resilience at all Levels. Following action done:-
(1) Overall 118 National Level training courses on Disaster Risk Management (DRM) conducted.
(2) Integration of DRR component in Academic Curricula.
(3) 8th October designated as National Disaster Awareness Day.
(4) Dedicated Media Cell established at NDMA for awareness / advocacy.
(5) Campaign on Safer Schools, Hospital & Cities initiated.

d. **Priority Action 4.** Reduce the Underlying Risk Factors. Following action done:-
(1) DRR compliance made mandatory for all development projects through P&D Departments of all Provinces and Federal Government.
(2) National Program for Social Safety.
(3) Mandatory Environmental Impact Assessments for all development projects.
(4) Gender & Child Cells established at National & Provincial Level.
(5) Guidelines for disability inclusive vulnerable groups formulated.
(6) DRR Integrated recovery and reconstruction pursued.
(7) Initiation of work on Disaster Risk Insurance study in progress.
(8) Formulation of Building Codes ensured. Act for violation of building codes as criminal offence being pursued.

e. **Priority Action 5.** Strengthen Disaster Preparedness for Effective Response at all Levels. Following action done:-
(1) National Response Contingency Plan in place.
(2) Raising of 6 Urban Search and Rescue teams in the country.
(3) Expansion of Rescue 1122 Emergency Services being pursued through Provinces.
(4) Citizen Damage Compensation Programed formulated.
(5) Expansion of Capacity Building Disaster Risk Management (CBDRM) Programs at Country Level being pursued.
(6) 9 Strategic Humanitarian Response Facilities established with support of WFP.
(7) Over 300 flood protection projects.

Appendix I

RELIEF ASSISTANCE PROVIDED WITHIN COUNTRY BY NDMA - PROVINCEWISE

Description	Punjab		
	2013	**2014**	**2015**
Shelter / Tents	28,702	20,200	10,000
Tarpulins / Shelters	-	-	-
Blankets	-	21,000	-
Ration / Food Packs/MRE (Meal Ready to Eat)	188,397	-	-
Mosquito Nets	10,000	-	-
Rescue Boats	-	34	26
Generators	-	-	-

ANNEX-I

Details of the Scientific Achievements of past two years (2013-14 & 2014-15) of GCISC Publications

a) International Papers : 19

1. Zhu, T., C. Ringler, M.M. Iqbal, T.B. Sulser and M.A. Goheer **(2013). Climate change impacts and adaptation options for water and food in Pakistan: scenario analysis using an integrated global water and food projections model.** Water International, 38(No. 5), 651-669.
2. Punyawardena, B.V.R., S. Mehmood, A. K. Hettiarachchi, M. Iqbal, AS.H.S.A. De Silva and A. Goheer (2013). Future climate of Sri Lanka: An approach through dynamic downscaling of ECHAM4 General Circulation Model (GCM). Tropical Agriculturist 161: 35-50.
3. Hashmi MZ, Shamseldin AY, Melville BW (2013) Statistically Downscaled Probabilistic Multi-model Ensemble Projections of Precipitation Change in a Watershed. Hydrological Processes.Volume 27, Issue 7. DOI: 10.1002/hyp.8413.
4. Qurat ul Ain Ahmad, Jaepill Cho (2013). "Assessment of changing climate to ascertain future water availability in Hunza River, HKH region, Northern Pakistan using SWAT Hydrological Model" (http://www.apcc21.org/eng/acts/op/japcc0206_viw.jsp).
5. M.M. Sheikh, N. Manzoor, J. Ashraf, M. Adnan, D. Collins, S. Hameed, M. J. Manton, A.U. Ahmed, S.K. Baidya, H.P. Borgaonkar, N. Islam, D. Jayasinghearachchi, D.R. Kothawale, K.H.M.S. Premalal, J.V. Revadekar, and M.L. Shrestha (2014). "Trends in extreme daily rainfall and temperature indices over South Asia", International Journal of Climatology. DOI: 10.1002/joc.4081.
6. M. Amjad, Q. Zafar, F. Khan and M.M. Sheikh **(**2014). "Evaluation of weather research and forecasting model for the assessment of wind resource over Gharo, Pakistan", International Journal of Climatology. DOI: 10.1002/joc.4089.
7. M.Z. Hashmi and AY Shamseldin (2014). Use of Gene Expression Programming in regionalization of flow duration curve. Advances in Water Resources (DOI: 10.1016 /j.advwatres.2014.02.009).
8. M. R. Anis and M. Rode (2014). "A new magnitude category disaggregation approaches for temporal high-resolution rainfall intensities". Hydrological Processes (DOI: 10.1002/hyp.10227).
9. Qurat ul Ain Ahmad (2014). "Runoff Scenarios and Water Based adaptation strategies in South Asia", contribution to APN project (ARCP 2013-20 NMY-Shrestha) involving three regional countries: Bangladesh, Nepal and Pakistan, published in APN Annual Bulletin - 2014.
10. N. Pepin, R. S. Bradley, H. F. Diaz, M. Baraer, E. B. Caceres, N. Forsythe, H. Fowler, G. Greenwood, M. Z. Hashmi, X. D. Liu, J. R. Miller, L. Ning, A. Ohmura, E. Palazzi, I. Rangwala, W. Schöner, I. Severskiy, M. Shahgedanova, M. B. Wang, S. N. Williamson and D. Q. Yang (2015). Elevation-dependent warming in mountain regions of the world. Nature Climate Change 5,424–430(2015) doi:10.1038/nclimate2563.
11. Firdos Khan, Jürgen Pilz, Muhammad Amjad and David A. Wiberg (in press 2015), "Climate variability and its impacts on water resources in the Upper Indus Basin under IPCC climate change", Int. J. Global Warming. http://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=ijgw
12. N. Forsythe, HJ Fowler, S Blenkinsop, A Burton, CG Kilsby, DR Archer, C Harpham, Hashmi, MZ (2014) Application of a stochastic weather generator to assess climate change impacts in a semi-arid climate: the Upper Indus Basin. Journal of Hydrology. doi:10.1016/j.jhydrol.2014.06.031.

13. N. Forsythe, A. J. Hardy, H. J. Fowler, S. Blenkinsop, C. G. Kilsby, D. R. Archer, and M. Z. Hashmi, 2015: A Detailed Cloud Fraction Climatology of the Upper Indus Basin and Its Implications for Near-Surface Air Temperature. J. Climate, 28, 3537–3556. doi: http://dx.doi.org/10.1175/JCLI-D-14-00505.1.
14. M. R. Anis and M. Rode "Effect of climate change on overland flow generation: a case study in central Germany". (DOI: 10.1002/hyp.10381, Hydrological Processes 2014).
15. Ali, S., Li, D., Congbin, F., & Khan, F. (2015). Twenty first century climatic and hydrological changes over Upper Indus Basin of Himalayan region of Pakistan. *Environmental Research Letters*, 10(1), 014007.
16. Ali, S., Li, D., Congbin and Yang, Y. (2014): The Performance of Convective Parameterization Schemes (CPSs) in Asia Using REGional Climate Model (RegCM): the 1998-2002 simulation in three typical regions. *Advances in Atmospheric Sciences* doi:10.1007/s00376-014-4158-4
17. Mehwish, Ramzan, Suryun Ham, Muhammad Amjad, Eun-Chul Chang and Kei Yoshimura, (Accepted-2015) "Sensitivity evaluation of convective parameterizations and spectral nudging schemes in historical dynamical downscaling for South Asia" Journal of the Meteorological Society of Japan.
18. Zhu, T., T., H. Xie, A. Waqas. C. Ringler, M. Mohsin Iqbal, M. Arif Goheer and T. Sulser. 2014. Climate Change and Extreme Events: Impacts on Pakistan's Agriculture. Policy Note 002, Pakistan Strategy Support Programme and International Food Policy Research Institute (IFPRI), USA.
19. Anis, M. R. and M. Rode. 2014. A new magnitude category disaggregation approach for temporal high resolution rainfall intensities, Hydrological Processes, DOI:10.1002/hyp.10227.

b) <u>National Papers: 3</u>

1. M. Mohsin Iqbal. 2103. Vulnerability of Fragile Ecosystems to Climate Change in Pakistan. *In* 'Climate Change – An Alarming Issue'. Lasbella University of Agriculture, Water and Marine Sciences (LUAWMS), Uthal, Balochistan, pp 58-69.
2. M. Zia ur Rahman Hashmi, M. Munir Sheikh, M. Mohsin Iqbal, Ghazanfar Ali and Arshad M. Khan 2014. Vulnerability of Small Island Developing States to Climate Change. Proceedings of Pakistan Engineering Congress.
3. Assimilation of remote sensing data in a hydrologic model to improve estimates of spatially distributed soil moisture and surface runoff. (Paper made and submitted to SUPARCO International conference on space; Institute of Space Technology, Islamabad 8 - 10 September 2014).

<u>Research Reports: 7</u>

1. Goheer, M.A. and M. M. Iqbal (2014).Use of Crop Simulation Models for Climate Change Studies: Proceedings of the Start-up Workshop under APN Project "Assessment of Food and Water Security in South Asia under Changing Climate using Crop Simulation and Water Management models and Identification of Appropriate strategies for Adaptation to Meet the Future Demand (ARCP2008-20NMY-Iqbal)", Global Change Impact Studies Centre (GCISC), Islamabad, Pakistan.
2. Iqbal, M.M., M.A. Goheer, B.V.R. Punyawardena, A. DeSilva and A. Hassan (2014).Final Report of APN Project "Assessment of Food and Water Security in South Asia under Changing Climate using Crop Simulation and Water Management models and Identification of Appropriate strategies for Adaptation to Meet the Future Demand (ARCP2008-20NMY-Iqbal)", Global Change Impact Studies Centre (GCISC), Islamabad, Pakistan.
3. Iqbal, M. M. and M. A. Goheer. (2014). Food and Water Security in South Asia under Changing Climate: Proceedings of the Start-up Workshop under APN Project "Assessment of

Food and Water Security in South Asia under Changing Climate using Crop Simulation and Water Management models and Identification of Appropriate strategies for Adaptation to Meet the Future Demand (ARCP2008-20NMY-Iqbal)", Global Change Impact Studies Centre (GCISC), Islamabad, Pakistan.

4. M. Munir Sheikh, Naeem Manzoor, Nadia Rehman, Muhammad Adnan, Arshad M. Khan, "Past and Projected Impacts of Climate Change on Forests of Pakistan", (2015), GCISC- RR-17, ISBN: 978-969-9395-19-2
5. Muhammad Adnan, Nadia Rehman, Javeria Ashraf, M. Munir Sheikh and Arshad M. Khan, (2015), "Seasonal Predictability of Monsoon Rains in Pakistan", GCISC RR-18 (Interim), Global Change Impact Studies Centre (GCISC), Islamabad, Pakistan
6. Kaleem Anwar Mir, Muhammad Ijaz, (2015), "GCISC Research Report: RR-19 (Interim): Greenhouse Gas Emission Inventory of Pakistan for the year 2011-2012, Global Change Impact Studies Centre (GCISC), Islamabad, Pakistan
7. "Climate Change Vulnerability Assessment for Islamabad and Islamabad Capital Territory (ICT)" carried out jointly by UN-HABITAT and MoCC. Three scientists from GCISC namely Mr. Munir Sheikh, Mr. Shahbaz Mehmood and Mr. Naeem Manzoor contributed in this report. The report was officially launched by the Honorable Federal Minister for Climate Change, Mr. Mushahidullah Khan on 05 June 2015.

Scientific Activities Organized by GCISC: 7

1.National Seminar for Planners and Policymakers on main findings of the APN Research Project: "Assessment of Food and water Security in South Asia under Changing Climate using Crop Simulation and Water Management Models and Identification of Appropriate Strategies to Meet Future Demand (ARCP2009-08CMY-Iqbal)", Islamabad; July 08, 2014.

2.National Conference on "Building Communities – Cultivating Peace", jointly organized by GCISC and Lok Sanjh Foundation (LSF), Islamabad; June 18-19, 2014.

3.2nd GCISC Capacity Building Workshop on "The Application of Earth System Models for Climate Change Prediction and Impact Assessment Studies with Focus on South Asian Monsoon" was organized by the Climatology Section from 27 October – 28 November, 2014 at GCISC, Islamabad.

4.Seminar on Sub-seasonal to seasonal prediction to cope with high impact weather in developing countries on 06 January 2015

5.Seminar on The Impact of Convective Schemes on Regional Climate and the Hydro-climate Projections in Typical Regions on 20 January 2015

6. Organization of Mid-term Training Workshop on "Application of University of British Columbia (UBC) Watershed Model for Hydrological studies" under the APN Regional Research Project "Runoff Scenarios and Water Based Adaptation Strategies in South Asia" at Islamabad from 27 – 30 April, 2015.
7. A Field visit to Gilgit Catchment was organized to collect field observations from Educationalists, farmers and NGO Member regarding CC related hazards and its implications from 11 – 17 June 2015 under APN Project ""Runoff Scenarios and Water Based Adaptation Strategies in South Asia (ARCP2013-20NMY-Shrestha)"

Scientific Contributions/ Presentations:

International : 22
National : 18

Participation of GCISC Scientists in Scientific Conferences, Workshops, Seminars etc.

International : 26
National : 118