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Tracking Adaptation and Measuring Development (TAMD) in Pakistan

Appraisal and Design Phase Report

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TAMD Appraisal and Design Phase Report:

Appraisal of Existing Monitoring and Evaluation Systems in Pakistan and Design of TAMD Prototypes

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Executive Summary

Whilst producing only 0.8% of global carbon emissions, Pakistan is one of the top ten most vulnerable countries to the adverse impacts of climate change. The most serious concerns for Pakistan are the threats to water, food and energy security, the vulnerability of coastal areas, and the increased risks of extreme events. Altogether 40% of Pakistan's population is highly vulnerable and is frequently exposed to multiple disasters, which are predicted to be exacerbated with impending impacts of climate change.

Although initiatives related specifically to climate change are recent, many environmental interventions over the last three decades have been of relevance to climate change adaptation. As climate change discourse has now entered into the policy formulation and planning processes in Pakistan, a number of climate specific initiatives have been undertaken in recent years. The Ministry of Climate Change has been constituted and the National Climate Change Policy has been approved. Many scattered related organs such as the National Disaster Management Authority and the Global Change Impact Study Centre have been consolidated under this Ministry. Moreover, the Task Force on Climate Change is working on an Implementation Strategy for the Climate Change Policy.

The Planning Commission is the apex body for socio-economic development planning. It prepares the National Plans covering all socio-economic sectors, and the monitoring and evaluation of major development projects and programmes. It has a key role in the formulation and implementation of the Climate Change Policy and the Plan of Action. The Planning Commission established a Task Force on Climate Change in 2008 in order to formulate the Climate Change Policy and the Plan of Action. The Planning and Development Department, as sub-national counterpart, exists at the provincial level with similar structure, functions, and processes for development planning and policy formulation. So far the few large-scale investments for climate change have gone through the normal planning channels and there is no bespoke system for evaluating adaptation-related funding. Since most of these investments are funded by development partners, the procedures of the respective donors, such as the Asian Development Bank and the United Nations, are also used for the M&E of these projects.

There are a number of agencies involved in the collection, compiling, synthesis, and reporting of data in Pakistan. The main agency, the Pakistan Bureau of Statistics, under the Ministry of Economic Affairs and Statistics, collects a wide range of information. The Pakistan Social and Living Standards Measurement survey is conducted every year. Several other agencies such as the State Bank and Ministry of Agriculture collect sectoral data. These different data sets are collected at different scales and periodicity according to the data requirements of the organisation.

Two projects are under considered for application of the TAMD approach. The first is the Rural Rainwater Harvesting Project, which was part of the shelter reconstruction effort after the earthquake in 2005. It aimed to address water shortages in high elevation settlements, thereby playing a vital role in climate change adaptation. Various data sources, ranging from the Planning Commission and donor monitoring and evaluation to local NGOs that are implementing the project, can be used to construct a TAMD framework. A second project for TAMD prototype development is to be identified using criteria in agreement with larger group of stakeholders.

Table of Contents

A note on adaptation and resilience – from an ecosystems perspective resilience and adaptive capacity are distinct while descriptions of social systems often use the terms interchangeably. This report addresses mainly how social systems respond to climate change, so for simplicity the term adaptation has been used with the assumption that it is a means to achieving climate resilience.

1. Introduction and Context

The aim of the appraisal was to assess the M&E systems currently in use in Pakistan and how the TAMD approach[1] to assessing the developmental effectiveness of climate adaptation investments could enhance them. A similar appraisal was carried out in other countries.

These Appraisal and Design Phase reports describe the degree to which climate change adaptation has been mainstreamed into development planning, the existing M&E systems for development in the economic and social sectors, and the systems currently in place for the M&E of climate change and adaptation interventions. They present the components of a national evaluative framework for climate adaptation and identify interventions that could be appropriate for testing the utility and feasibility of the TAMD approach.

The appraisal in Pakistan was based on interviews with key informants and a review of secondary literature and government documents. The Key informants were from the Ministry of Climate Change and its component organisations.

1.1 Current and Future Climate Effects and Vulnerabilities

Pakistan occupies a land area of over 880,000 square kilometres with over 1,046 kilometres of coastline along the Arabian Sea. With a latitudinal extent stretching from the sea in the south to the Himalayan Mountains in north, Pakistan includes subtropical to temperate regions. Most of Pakistan is arid and semi-arid with significant spatial and temporal variability in climatic parameters. The narrow strip along the coast has a coastal climate; the climate in the north, dominated by the mountains, ranges from humid to arid; while, in between, the climate is broadly of a tropical continental nature. Monsoon rains, between June and September, contribute an average 59% of total annual rainfall, and snow and ice-melt in the greater Himalayan region keeps the rivers perennial (PMD 2005).

Whilst producing only 0.8% of global carbon emissions, Pakistan is one of the top ten countries that are extremely vulnerable to adverse impacts of climate change. The most serious concerns for Pakistan are the threats to water, food and energy security, the vulnerability of coastal areas, and the increased risks of extreme events (TFCC 2010). Pakistan is currently exposed to numerous natural hazards including cyclones, floods, drought and intense rainfall. Altogether 40% of Pakistan's population is highly vulnerable and is frequently exposed to multiple disasters, which are predicted to be exacerbated with impending impacts of climate change (Oxfam 2009).

Pakistan's Global Change Impact Study Centre reported in 2009 that the specific climate concerns to Pakistan include:

[1] The Tracking Adaptation and Measuring Development (TAMD) approach offers a 'twin track' framework for use in many contexts and at many scales to assess and compare the effectiveness of interventions that directly or indirectly help populations adapt to climate change. TAMD emphasises the need to assess development interventions in the light of changing climate risks. The TAMD approach was elaborated by IIED, Garama 3C ltd and Adaptify. See http://www.iied.org/tracking-adaptation-measuring-development , http://pubs.iied.orgmostsearch.php?k=TAMD%3A+A+framework+for+assessing+climate+adaptation+and+development+effects&z=+

- Increased variability of the monsoon,
- More rapid recession of glaciers, thereby threatening Indus river system flows,
- Reduction in capacity of natural reservoirs due to a rise in snowline,
- Increased risks of floods and droughts,
- Severe water-stressed conditions in arid and semi-arid regions,
- Food insecurity due to reduced agriculture productivity,
- Upstream intrusion of saline water in the Indus delta,
- Risk to mangroves, coral reefs and fish breeding grounds,
- Increase in deforestation,
- Loss of biodiversity,
- Increased health risks (heat strokes, pneumonia, malaria and other vector-borne diseases),
- Risk to coastal areas,
- Risk to energy supply facilities.

Climate change, in general, is predicted to have an immense effect on the wellbeing of people in the region, as it is likely to exacerbate the existing food insecurity and malnutrition, along with likely increases in vector-borne diseases. In addition, increasing water stress will result in a lack of safe drinking water and adequate sanitation. The most affected are likely to be women, and poor and marginalised groups (TFCC 2010, ICIMOD 2009). Oxfam carried out community-based research in three districts of Pakistan to record climate change impacts on rural populations. The research found strong correlation with IPPC projections and the patterns modelled by the study centre. The respondents confirmed, among other changes, sea intrusion, rising temperatures, depleting agricultural outputs, erratic rainfall and groundwater deteriorating in level and quality (Oxfam 2009).

In view of the limited capacity for assessment of weather patterns, early warning and extreme events, it has been difficult for Pakistan to prepare short-term responses or disaster mitigation strategies. In the absence of detailed rural vulnerability and risk assessments, long-term strategies for adaptation or mitigation can not be formulated (INC 2003). Pakistan thus needs to take urgent measures both to cope with the current situation, and prepare long-term adaptation and mitigation interventions to address the looming climate risks.

1.2 National Approaches to Mainstreaming Climate Change Adaptation

1.2.1 Overview

Climate change discourse has now entered into policy formulation and planning processes in Pakistan, and the country has undertaken various initiatives. Although initiatives related specifically to climate change are recent, many environmental interventions over the last three decades have been of relevance to climate change adaptation (TFCC 2010, Kakakhel 2011, Khan 2012). The significant milestones of climate change mainstreaming may be synthesised as follows:

Table 1: National Approaches

Year	Initiative / Action
1994	Pakistan ratified the **UN Framework Convention on Climate Change.**
1997	The **Pakistan Environmental Protection Act** was passed, which replaced the Pakistan Environmental Protection Ordinance of 1983. The act empowered the creation of institutions and regulation of activities relating to environment. Environmental protection agencies were established at federal and sub-national levels.
1997	The **Pakistan Environmental Protection Council**, headed by the Prime Minister, was established as the apex decision-making body on environmental affairs.
2001	The **National Environmental Action Plan** was approved to follow up with the National Conservation Strategy, which narrows the government's policy focus on the environment to four core programmes, which include clean air, clean water, waste management and ecosystem management.
2002	The **Global Change Impact Studies Centre** was established as a dedicated institution for climate change research
2002	The **National Action Programme to Combat Desertification in Pakistan** was launched. **Drought Emergency Relief Assistance** (DERA) was planned and the DERA Unit within the Planning Commission was established to coordinate implementation, monitoring and evaluation of drought mitigation activities in affected areas.
2003	Pakistan submitted its **Initial National Communiqué to the UNFCCC**.
2005	The **National Environmental Policy** (2005-15) was prepared. It addressed various sectoral issues, including water management and conservation, energy efficiency and renewable resources, agriculture and livestock, forestry and plantation, biodiversity, protected areas as well as climate change, air quality, noise pollution and waste management.
2005	Pakistan ratified the **Kyoto Protocol**.
2005	The **Prime Minister's Committee on Climate Change** was established to address climate issues as the highest forum for monitoring and strategic guidance.
2006	The **Policy for Development of Renewable Energy for Power Generation** was launched In order to address environmental and climate change concerns. The **Alternative Energy Development Board** was established for the development and promotion of renewable energy interventions, based on the renewable policy.
2006	The Prime Minister approved the **Pakistan National Operational Strategy** in 2006 to establish the Clean Development Mechanism (CDM) in Pakistan to generate Carbon Credits. The Ministry of Environment was made the Designated National Authority (DNA) for CDM affairs.
2007	**Pakistan in the 21st Century: Vision 2030** was launched, a roadmap to achieving sustainable economic development, with emphasis on managing climate change threats, both in terms of mitigation and adaptation, promotion of renewables, and conservation measures across sectors.
2007	The **National Disaster Risk Management Framework** (NDMRF) was launched. The framework contains outlines for a disaster risk management system and nine priority areas to address disaster risk reduction, with climate change being a cross-cutting theme.
2007	The **National Disaster Management Authority** was created in 2007 though an Ordinance, as the apex entity at the federal level to deal with the entire spectrum of disaster risk management, including climate change issues. The Ordinance became an Act in 2010.

2008	The **Task Force on Climate Change** was constituted by the Planning Commission in order to take stock of affairs regarding climate change concerns and make a set of recommendations to formulate a national climate change policy. Based on the report submitted by the Task Force in 2010, process to formulate a national policy on climate change began.
2008	The **Technical Advisory Panel on Climate Change** was set up, and led by IUCN, in order to provide technical support to the then Ministry of Environment on climate change issues.
2009	The **Integrated Energy Plan 2009-2022** was launched to make strong recommendations for renewables, bio-diesel and conservation measures, with a target of 12% share of renewables towards the total energy requirements by 2022.
2009	The **National Impact Assessment Programme** was launched, which aims to contribute to sustainable development by strengthening the EIA regime and introducing Strategic Environmental Assessment in all development planning.
2010	The **National Economic and Environmental Development Study** was undertaken with the support of UNFCC. The study deals with climate change mitigation and adaptation options.
2011	Under the 18th Constitutional amendment, **18 ministries were devolved to provinces,** with the result that the subjects of environment and disaster management fell within the purview of provincial governments.
2011	The **Ministry of Climate Change** was established, mandated to deal with issues of policy, legislation, plans, strategies and programmes with reference to climate change, disaster management, environmental protection and preservation, coordination, monitoring, and implementation of agreements with other countries, international agencies and forums.
2012	Pakistan became a partner country in the UN **REDD+ Programme**
2012	The Government approved the **National Climate Change Policy**. In order to implement the Policy, the **National Plan of Action for Climate Change** has been prepared. These are both being adjusted in line with outcomes of Rio+20 conference, with a focuss on strengthening, reforming, and integrating economic, social and environmental dimensions of sustainable development.

(Source: Multiple Sources**)**

International Context

Pakistan participates in numerous international forums and contributes to global dialogues on climate change, sustainable development and conservation. It is signatory to fifteen Multilateral Environmental Agreements, mainly related to biodiversity, climate change, land reclamation / rehabilitation, and chemical and hazardous materials (on land, in the atmosphere and in the seas). The conventions and protocols have been ratified and their implementation is mandatory.

On the basis of these international commitments, Pakistan has formulated a number of policies, pieces of legislation, frameworks and action plans to address environmental challenges including climate risks. Given the low institutional and financial capacity to adapt to climate change, enhancing adaptive capability is the highest priority. Pakistan requires financial and technical assistance to respond effectively to climate change impacts and develop sound adaptation strategies (INC 2003). There has been technical and financial support for interventions and policy development related to the environment and climate change, provided by the UN, various INGOs and bilateral and multilateral donors (Kakakhel 2011). However, the country is seeking further international cooperation in terms of capacity building, and the transfer of funds and technology, to manage climate risks.

1.2.2 National Structures and Mainstreaming

The **Planning Commission** is the apex body for socio-economic development planning, with the Prime Minister as its ex-officio chairman, with a full-time deputy chairman assisted by members. The Commission is responsible for preparing short and long term plans and policies, and the **Public Sector Development Programme** for prioritising resource allocation. In order to mainstream environment into the planning processes, there is a dedicated Environment Section. Socio-economic development planning is based on annual development plans, five-year development plans and the perspective plan of 15 years or longer-term. The tenth five-year plan is currently being implemented. The **Planning and Development Department**, as sub-national counterpart, exists at the provincial level with similar structure, functions, and processes for development planning and policy formulation.

During the last decade, development planning has been based on the **Poverty Reduction Strategy Paper**, adopted to reduce poverty and meet the Millennium Development Goals. The strategy paper is an overarching policy document, addressing development issues – which include economic, gender, environment, health, education, social protection and employment (UNDP 2009) – towards long-term poverty reduction. The Planning Commission, in 2007, prepared a long-term plan called **Pakistan in the 21st Century: Vision 2030**. It was approved by the National Economic Council, and envisages "a developed, industrialised, just and prosperous Pakistan through rapid and sustainable development in a resource-constrained economy by deploying knowledge inputs" (PC 2009). Vision 2030 addresses climate change concerns across the sector, as well as in specific terms with reference to adaptation and mitigation. These include sustainable management of the natural resource base; protection of the environment, addressing pollution, biotechnologies, alternative renewables, drought resistant and water efficient crops; and water conservation measures.

In order to realise Vision 2030, a **Mid Term Development Framework** was formulated for the period 2005-2010. The main framework objective was to establish a just and sustainable economic system to achieve Millennium Development Goals. Highest priority was given to goal targets to be achieved by 2015. Overall 18 global targets and 48 indicators were adopted in 2000 to achieve the goals. Pakistan, however, given the specific conditions, priorities, data availability and institutional capacity, translated these into 16 targets and 37 indicators (PC 2008). Realising the critical importance of energy for rapid and sustainable growth, the government set up a Task Force to prepare a comprehensive report, the Energy Security Plan: 2005-2030.

The current policy guidelines, a '**Framework for Economic Growth',** have been prepared by the Planning Commission and approved by the Executive Committee of the National Economic Council, which is the apex forum for decision making regarding development issues. Given that development planning is now the shared responsibility of the national and sub-national governments, the framework is meant to guide the provincial governments in their development planning processes. The framework contains provisions for climate-proofing development and promises to provide resources for environmental as well as adaptation and mitigation interventions. Furthermore, provision is also made for the protection

of economic growth through mainstreaming disaster risk reduction within the planning processes and strengthening the disaster risk management system (PC 2010, Khan, 2010, Kakakhel 2011).
The **governance structure of the country** has changed significantly during the tenure of the current government, with various constitutional amendments and changes to legislation. In 2009, the National Finance Commission amended the formula for sharing revenue between the centre and the federal units, giving the lion's share to the provinces. Under the 7th National Finance Commission Award, the share of the federating units increased to 57.5% from 48.75%. In addition, under the 18th Constitutional Amendment, 18 federal ministries, dealing with subjects that include environment, health, food, disaster management, agriculture, labour and manpower, population welfare, women and youth affairs, have been devolved to provinces. All these subjects now fall within the domain of provinces. The remaining subjects include national development planning and inter-provincial coordination, which are the joint responsibility of national and sub-national government. Because of these amendments, the 10th five-year plan has been put on hold and provincial governments have prepared their own development plans, based on the Framework for Economic Growth (Khan 2012, Kakakhel 2011).

There has been considerable restructuring and realignment required as provincial governments take over the devolved subjects dealing with environment and climate change. These include forestry sector development programmes, clean drinking water programmes, environmental monitoring, watershed management, sustainable land management, and sanitation programmes. There are more than 211 projects addressing environment and climate risks being implemented at the federal and provincial levels. In view of devolution, existing environmental acts are being developed or revised, and provincial governments are expected to lead in implementing policies related to environment and climate change. In order to enhance the capacity for the integration of environment and development planning at federal and provincial levels, the National Impact Assessment Programme has undertaken various capacity building activities. Simultaneously, the Core Group on Environment, Climate Change and Sustainable Development is in consultation regarding the integration of environment and climate change into development planning (Annual Plan PC 2012).

1.2.3 Institutional Arrangements for Climate Change

With the environment and climate change being cross-cutting issues, numerous government entities are involved in addressing them. These are outlined below, with the four key entities being described first.

The **Prime Minister's Committee on Climate Change** was put in place in 2005 at the federal level. This overarching body meets once in a year to monitor and take stock of climate-related developments and provide strategic direction.

The **Ministry of Climate Change** is now the apex forum to deal with climate change and environmental issues. The Ministry is mandated to deal with policy, legislation, plans, strategies and programmes with reference to climate change, disaster management, environmental protection and preservation, coordination, monitoring, and implementation of agreements with other countries, international agencies and forums. The agencies and authorities that are now part of the Ministry include the

National Disaster Management Authority, the Global Change Impact Study Centre (a dedicated climate research centre), the Pakistan Environmental Protection Agency, and Pakistan Environmental Planning and Architectural Consultants Limited. The Ministry coordinates climate related activities with federal ministries and other relevant entities through the Inter-Ministerial Committee on Climate Change, which was established in 2008. International negotiations within the UNFCC and mobilisation of international support for climate change related interventions is managed by the Ministry of Climate Change in coordination with the Ministry of Foreign Affairs, and with the technical support of the Task Force on Climate Change. In order to discuss and develop approaches towards international negotiations under UNFCCC, a Core Group is in place. With Ministry of Climate Change in the chair, it comprises representatives from relevant ministries, non-government organisations and think tanks. The Ministry has recently prepared a Climate Change Action Plan and this is to be followed by the formulation of the Nationally Appropriate Mitigation Actions and the National Adaptation Plan of Action (TFCC 2010, GoP 2012).

The **Planning Commission** prepares the National Plans covering all socio-economic sectors, and the monitoring and evaluating of major development projects and programmes. It has a key role in the formulation and implementation of the Climate Change Policy and the Plan of Action. The Planning Commission established a **Task Force on Climate Change** in 2008 in order to formulate the Climate Change Policy and the Plan of Action. The Task Force comprised 17 members, which include federal secretaries of key ministries, heads of relevant departments and agencies, and representatives of the national and international organisations. The Federal Cabinet approved the **National Climate Change Policy** in March 2012 to steer the country towards climate-resilient development. The policy seeks to ensure the mainstreaming of climate change into economically and socially vulnerable sectors, to address climate change impacts on food, energy, and water securities.

Other ministries and government organisations addressing climate change include the Ministry of Food and Agriculture, Ministry of Livestock and Dairy Development, Ministry of Water and Power, Ministry of Industries and Production, Ministry of Science and Technology, Ministry of Foreign Affairs, and the Ministry of Health. Various institutions, established under the different ministries, both at federal and provincial level, have a specific mandate to deal with climate change and environment, as outlined in Table 2.

Table 2: Other Government Organisations Addressing Climate Change

Organisation	Mandate and Capacities
Pakistan Meteorological Department (PMD)	Scientific and service entity; weather forecasting; multi-hazard early warning and monitoring; maintaining climate data; climate modelling.
Global Change Impact Study Centre (GCISC)	Dedicated research centre to investigate climate change trends based on weather data, modelling to generate past trends across the climatic zones and using special models to make climate change projections for the short and long terms.
Pakistan Forest Institute	Capacity in large-scale reforestation and afforestation.
Pakistan Agricultural Research Council	The apex national agricultural research organisation, to undertake, promote and strengthen agricultural research. Implementing various projects on drought-resistant

(PARC/NARC)	varieties, alternate crops, pest and disease control, water harvesting, modern irrigation techniques etc.
Water and Power Development Authority (WAPDA)	Capacity in high altitude climate data collection, physical mapping of glaciers, measurement of river-flows, reservoir monitoring and control, watershed modelling and mitigation activities within the power sector.
Space and Upper Atmosphere Research Commission (SUPARCO)	Specialised capacity in remote sensing, GIS for use in climate and hazard research.
National Institute of Oceanography (NIO)	An autonomous research organisation to conduct multi-disciplinary research in physical, chemical, biological and geological aspects of oceanography in Pakistan's maritime zone, which include measuring sea level rise, intrusion of salt water, loss of land due to sea intrusion and other related aspects in coastal areas, with reference to climate change.
COMSATS Institute of Information Technology	Teaching facilities for post-graduate research in meteorology and climatology, and capacity for glacier monitoring studies.
Centre for Environmental Economics and Climate Change (PIDE)	To conduct and supervise research on environmental degradation and climate change, disseminate results among researchers and policy makers, set up an academic program in Environmental Economics, and establish a data bank on environmental indicators.
Pakistan Atomic Energy Commission (PAEC)	Specialised capacity to measure surface and sub-surface water flows and identify their sources of origin, mitigation through the use of nuclear power, and development of national GHG inventory.
Hydrocarbon Development Institute	Capacity for development of national GHG inventory and use of CNG as transportation fuel.
Alternative Energy Development Board (AEDB)	To implement government policies and plans, develop projects, promote local manufacturing, create awareness and facilitating technology transfer, channel international assistance, and coordinate activities as the national facilitating agency for the development of renewable energy in the country.
Pakistan Council of Renewable Energy Technologies (PCRET)	A research and development organisation working in the field of renewable energy technologies, mainly photovoltaic, solar thermal, biogas, micro-hydel and wind power.
National Energy Conservation Centre (ENERCON)	Set up to promote and improve energy conservation measures. It has implemented several projects on energy conservation.
Pakistan Environmental Protection Agency (Pak-EPA)	Apex federal agency for implementing the Pakistan Environmental Protection Act, 1997, and the designated authority to review all environmental impact assessment reports and monitor compliance towards environmental rules and regulations.
Pakistan Council for Research in Water Resources (PCRWR)	Mandated to conduct, organise, co-ordinate and promote research in all fields of water resources engineering, planning and management, so as to optimally use the available land and water resources and to help achieve sustainability in the agricultural sector.
National Disaster Management Authority (NDMA)	Apex authority to deal with the entire spectrum of disaster management, with provincial counterparts, the provincial disaster management authorities.
Clean Development Mechanism Cell	Established within the Ministry of Climate Change, the Cell works with public and private sector partners to process suitable CDM projects for attracting investments, together with technology transfer and capacity building.
Agriculture Universities	Agriculture University, Faisalabad and Arid-Agriculture University, Rawalpindi, among others, have agricultural research facilities for development of improved varieties and

	heat-resistant crops.
Provincial Forest Departments	The Forest Department is responsible for the management of forests, wildlife, rangeland, watersheds, sericulture, and medicinal plants, as well as soil conservation. The department focus is to conserve the existing natural resources and put a stop to rapidly deteriorating environmental conditions.
Provincial Irrigation Departments (PIDs)	The Irrigation Departments are responsible for supervising, directing and controlling flood prevention measures, including flood protection works in terms of construction, maintenance and repair, operating gauge stations, and providing information and data to concerned authorities for alerts, warnings and forecast, coordinating surveys, and investigating the extent of damages to flood protection works.
Provincial Environmental Protection Agencies	Provincial Environmental Protection Agencies (EPAs) established in all four provinces, with a focus on industrial and urban pollution problems.
Private Power Infrastructure Board	Acts as a 'one-window' facilitator for conventional private sector power generation projects, including RE hydel-power projects of more than 50 MW capacity.
Drought Emergency Relief Assistance (DERA)	Provides assistance in drought-affected areas through improved management of water resources, supporting efficient water use, and water conservation and harvesting, supporting a range of services in agriculture, livestock, forestry and rangelands.

(Source: Multiple Sources**)**

International development organisations are also addressing climate change in Pakistan**.** They include the World Bank and the Asian Development Bank, who are main donors for development projects in Pakistan, along with UKAID, USAID, NORAD and SDC. Among non-governmental organisations, the International Union for Conservation of Nature, Worldwide Fund for Nature, Oxfam, International Centre for Integrated Mountain Development, GIZ, Save the Children, Leadership for Environment and Development, and the Sustainable Development Policy Institute are all undertaking activities related to the climate change through assistance in policy development, research, advocacy and awareness raising. The UN agencies significantly contributing towards the climate change agenda include UNDP, UNICEF, UNESCO, UNIDO and FAO (TFCC 2010, Oxfam 2009, Kakakhel 2011).

1.3 Large-scale Interventions on Climate Adaptation

According to the Planning Commission, there are currently 211 climate and environment-related projects being implemented by the federal and provincial governments. These include capacity building, clean drinking water, environmental management, urban development, enhancing tourism, restoration of lakes / water bodies, awareness raising, waste management and wetlands. Based on the criteria of scale, size, coverage, funding, and expected impact, four major projects related to climate adaptation are the focus of this appraisal and outlined below.

Sustainable Land Management to Combat Desertification in Pakistan (SLMP)

The Government launched the national SLMP project in 2009. The overall goal is to combat land

degradation and desertification, in order to protect and restore ecosystems and essential ecosystem services that are key to reducing poverty. The principal objectives are to strengthen institutional capacity, create an enabling environment, and demonstrate sustainable land practices. The Project follows an integrated, cross-sectoral and participatory approach to combating desertification and alleviating poverty among rural communities. The project partners are the Ministry of Climate Change, the United Nations Development Programme, and the Provincial Planning and Development Departments. The total cost of the project, with implementation in two phases over seven years, is US$17,440,000, which has been jointly funded by the Government of Pakistan, the UNDP and the GEF. Phase I will focus on capacity building, site-specific pilot projects / feasibility studies for testing sustainable land management practices, and designing interventions. Phase II will strengthen the sustainability of initial interventions and launch full demonstration projects, e.g. sustainable agriculture practices, water and soil conservation techniques, integrated management of natural resources, sustainable pastoral activities, and agro-forestry. These all directly or indirectly contribute to climate adaptation. Phase II will also emphasise the development of appropriate economic and social incentives to facilitate the mechanisms for economic sustainability and replication of best practices.

The achievements of the project to date are many. A review of agriculture and water sector policies has been carried out in the context of sustainable land management and the ongoing UNCCD 10-year strategy. The National Forest Policy fully incorporates the principles of sustainable land management. A gap analysis report has been circulated for peer review. There is a Revised National Action Plan to incorporate emerging issues of climate change into national and sub-national sectoral planning. National criteria and indicators for Sustainable Land Management have been prepared. Two participatory research projects have been launched to develop and disseminate innovative techniques to control land degradation and promote sustainable land management. A public-private partnership project for promotion of drought and disease resistant varieties in rain-fed areas of Punjab has been launched. In collaboration with PMD, a project for 'Strengthening Drought and Flood Early Warning System in Pakistan' has been launched. Advocacy material has been prepared and widely disseminated both at policy, intermediary and community level. Participatory GIS-based draft land use plans have been prepared for 20 villages, covered by 9 projects. Draft guidelines for national level land use planning have been developed, while guidelines for village land-use planning have been prepared and village communities trained in utilisation of these plans.

Reducing Risks and Vulnerabilities from Glacier Lake Outburst Floods

The overall objective of this four-year project (initiated in 2011) is to reduce climate change induced risks of Glacial Lake Outburst Floods (GLOFs) and snowmelt flash floods in Northern Pakistan. The project is being implemented in the pilot areas of Gilgit-Baltistan and Chitral. It aims to develop the human and technical capacity of public institutions and vulnerable communities to understand and address immediate GLOF risks. It aims that national, provincial, district and local communities are able to prioritise and implement climate change adaptation measures. The project will develop the capacities of local level institutions such as agriculture, livestock and forest departments, and federal level

institutions such as the Ministry of Kashmir Affairs and the Ministry of Climate Change. The major project components include: policy recommendations and institutional strengthening to prevent climate change induced GLOF events; steps to improve risk mapping, early warning and prevention planning; and documenting GLOF risk management at the village and district levels to provide an evidence base for replication and up-scaling in other GLOF prone areas. The project budget is $7,600,000, with $3,600,000 in cash contributions from the Adaptation Fund and $500,000 in cash from UNDP, and the remainder as contributions in kind from the Government.

The Rooftop Rainwater Harvesting Project

The Earthquake Reconstruction and Rehabilitation Authority implemented a successful pilot rooftop rainwater harvesting project in two villages, under its Water and Sanitation component. The Oil Producing Countries Fund for International Development provided US$ 6.2 million to implement the project on a large scale, in 20 earthquake-affected union councils of Azad Jammu and Kashmir and Khyber Pakhtunkhwa. Altogether 250,000 people from 40,000 households are expected to benefit from the project. This is the first large-scale Public Sector Development Project for rainwater harvesting. With an annual average rainfall of 1,500mm, the rainwater harvesting is expected to meet 60-80% of a household's water requirements, and build resilience in the face of uncertain water supply in rural, hilly and fragile areas. By adopting this technology, water becomes available at consumption point and yields a range of benefits such as: improved sanitation and hygiene, increased kitchen garden yield, additional livestock, increased school attendance, improved child and maternal health, and saved time from fetching water. The technology provides water on a sustainable basis, without depleting underground water resources. It is decentralised and increases climate adaptive capacity.

Research for Agricultural Development Programme

The Pakistan Agricultural Research Council is an apex national research organisation, mandated to provide science-based solutions to agriculture in Pakistan, in order to address issues of national food security. The Council prepared an umbrella research programme, the Research for Agricultural Development Programme in 2007, with a total cost of Rs2963 million for a period of 60 months. The programme was approved by the Planning Commission and has been funded through the Public Sector Development Programme.

The main objectives of the programme are to address current and emerging needs of science-based agricultural development to achieve food security on a sustainable basis, poverty reduction, economic efficiency and export competitiveness; to provide a timely response to emerging research issues and problems such as pest epidemics, nutrition deficiency and climate change; to maximise productivity in terms of unit of land, water, animal, labour and capital; to innovative research with reference to product, technologies and services for small farmers; and to enhance research capability and upgrade research infrastructure. All together 69 research projects have been planned and are being implemented by different divisions of the Agricultural Research Council. They have already generated

useful information and data sets for planning and policy making.

In terms of natural resources, project focus is on improving land and water productivity and enhancing their use efficiency through drip and trickle irrigation, plant nutrition management, chemical and bio-chemical reclamation of salt affected soils, soil pollutants, and modelling for climate change. For crops, salt-, drought- and rust-tolerant varieties are under test, while hybrids of sunflower, canola, mustard, tomato, citrus and fodder crops are tested and made available for commercialisation. Sugarcane varieties, fungus-free potato seeds, and adapted ginger and turmeric have been developed. For livestock, the animal scientists have developed technologies of stair-step feeding regime to induce early puberty and heat synchronisation of large ruminants, to improve production and reproduction of these animals, improved preservation of buffalo and goat semen for enhancing its quality, and vaccine development for avian influenza. Research projects related to social sciences are analysing the commodity value chain, agricultural growth and poverty reduction, food consumption diversity, harvest and post-harvest losses, and are also working for capacity building of scientists, researchers and community workers.

2. National M&E Systems for Development in the Economic and Social Sectors

2.1 National Data and Information Systems

Government statistics in Pakistan come from a number of primary and secondary data sources. Various public departments and agencies have been established by government to collect data and manage the national statistics. They conduct different socio-economic and demographic surveys, and collect socio-economic, demographic, environmental, and agricultural data. The government also uses data and information gathered by international agencies such as the World Bank, United Nations, Asian Development Bank and the International Monetary Fund. Two Acts (Industrial Statistics Act 1942 and General Statistics Act of 1975) provide legal support for collecting data and information, particularly in primary surveys. They support the preparation of reliable statistics by ensuring the privacy of respondents and by making the statistical activities fair.

2.1.1 Agencies Involved in Data Collection and Management

The following are the main agencies involved in the collection, compiling, synthesis, and reporting of the data in Pakistan.

The Pakistan Bureau of Statistics, under the Ministry of Economic Affairs and Statistics, collects information on agriculture, business, demography, energy and mining, foreign trade, industry, labour force, national accounts, population welfare, price, social statistics etc. The Pakistan Social and Living Standards Measurement survey is conducted every year.

The Population Census Organisation, under the Ministry of Economic Affairs and Statistics, is the official agency of Federal Government responsible for carrying out Population and Housing Census. It releases data for public and private use in the form of regular census reports and a number of supplementary reports. The census is based on demographic indicators such as employment, literacy, and housing.

The Agricultural Census Organisation is also under the Ministry of Finance and Economic Affairs. It liaises with provincial government departments, and plans and supervises field operations throughout the whole country. Besides its own staff, the organisation trains field staff for the task of enumeration. These are from the various provincial government departments, such as Land Revenue, Livestock and Dairy Development, and Agriculture Extension Departments.

The Population Association of Pakistan aims to promote and strengthen the discipline of population by providing subject experts, facilitating professional development, sharing scientific knowledge, and sharing experiences with related disciplines. It brings the members of the Association together periodically in a multidisciplinary environment of international professional exchange, and organises conferences. It also arranges lectures for young professionals and the general public, facilitates research, and offers advice on critical policy issues.

The National Institute of Population Studies is an autonomous organisation established by the Government in 1986 to undertake population and development research. It provides feedback to the Government for planning and policy formulation in the sphere of population welfare and development; and provides feedback for pragmatic implementation and effective monitoring of Reproductive Health / Family Planning programs.

The State Bank of Pakistan, under the Ministry of Finance, collects and manages data on various issues related to macroeconomic and monetary policy. It assists policy makers to take prudent steps for the economic management of Pakistan.

The Hydrocarbon Development Institute of Pakistan supports the development of the domestic energy sector by disseminating vital technical information through the annual publication of the Pakistan Energy Year Book. It works under the Ministry of Petroleum and Natural Resources.

2.1.2 Main Data Sources

Data is collected from individuals, households, sectors and organisations on a wide range of topics including socio-economic, environmental, demographic, labour, and agriculture. The Pakistan Bureau of Statistics is the source of much of the data listed in Table 3 below. However, other organisations have made efforts to fill the gaps in the government statistical system and are included in the list. It should be noted that, since there are many large and diverse data sets from different regions and organisations, inconsistencies, gaps, mismatches and overlaps can be expected.

Table 3: Data Sources

	Data	Source Organisation
1	Social Indicators of Pakistan 2011	Pakistan Bureau of Statistics
2	District Level Employment Trends 2009-10	Pakistan Bureau of Statistics
3	Crops Area and Production by Districts (1981-82 TO 2008-09)	Pakistan Bureau of Statistics
4	Pakistan Social and Living Standards Measurement Survey 2010-11 Provincial / District	Pakistan Bureau of Statistics
5	Household Integrated Economic Survey 2010-11	Pakistan Bureau of Statistics
6	Compendium on Environment Statistics of Pakistan 2010	Pakistan Bureau of Statistics
7	Economic Census 2005	Pakistan Bureau of Statistics
8	Pakistan Demographic Survey – 2007	Pakistan Bureau of Statistics
9	Census of Mining Industry (C.M.I) 2002-2003 (Main Findings)	Pakistan Bureau of Statistics
10	Census of Manufacturing Industries (CMI) 2005-06	Pakistan Bureau of Statistics
11	Census of Mining & Quarrying Industries (CMQI) 2005-06	Pakistan Bureau of Statistics
12	Census of Private Educational Institutions Pakistan 1999-2000	Pakistan Bureau of Statistics
13	National Education Census 2005 Pakistan	Pakistan Bureau of Statistics
14	Time Use Survey 2007	Pakistan Bureau of Statistics
15	Compendium on Gender Statistics of Pakistan 2009	Pakistan Bureau of Statistics
16	Pakistan Statistical Year Book 2011	Pakistan Bureau of Statistics
17	Pakistan Employment Trends 2011	Pakistan Bureau of Statistics

18	National Health Accounts Pakistan 2007-08	Pakistan Bureau of Statistics
19	Agricultural Statistics of Pakistan 2010-11	Pakistan Bureau of Statistics
20	Labour Force Survey 2010-11	Pakistan Bureau of Statistics
21	Pakistan Demographic and Health Survey 2006-07	National Institute of Population Studies
22	Reproductive Health & Family Planning Survey (PRHFPS) 2001	National Institute of Population Studies
23	Pakistan Economic Survey 2011-12	Ministry of Finance, Pakistan
24	Pakistan Energy Year Book 2011	Hydrocarbon Development Institute of Pakistan
25	Handbook of Statistics on the Pakistan Economy 2005	State Bank of Pakistan

(Source: Pakistan Bureau of Statistics and Centre of Economic Research Pakistan, 2012**)**

2.1.3 The Gathering, Processing and Use of Data

Data gathering and processing is carried out by specially trained staff from the Planning and Development Division, Provincial Departments and associated agencies. A specially designed format (PMES-I) is used for data collection for progress monitoring and reporting implementation status (Planning Commission of Pakistan (2010)). It covers the cost, time schedule, objectives, and physical and financial progress approved in the project design document. This data also assists in the analysis of any changes in the plan of work, cost estimates, timeframe, and problems encountered during project implementation. PMES-II is a similar format, specifically designed to obtain quarterly progress updates from executing agencies. It records monitoring information regarding, for instance, material use, allocation of funds, constraints, timelines, and achievements of objectives. Data and information are additionally gathered from informal sources.

Data use. Almost all concerned departments, project directors, and staff use this data to monitor progress and outcomes, and to evaluate projects / programmes

Key Informant Interview: An interview was conducted with an M&E specialist from the M&E Section of the Planning Commission to investigate the practical implementation of the procedures and approaches of data collection and M&E systems. It was found that although manuals provide guidelines about the tools and techniques for data collection, the application of the M&E framework, and the use of data for M&E practices, they are not followed in practice. Because the project type, the nature of activities, and situation varies, the M&E procedures and practices are, in fact, tailored to each scenario. For instance if the data collection format is not appropriate for a certain activity, a specific questionnaire is designed to collect the information required. The interviewee further enlightened that when project beneficiaries are community members, information should be collected and used in a way that gives the most accurate results for reasonable cost. It was also said that suitable and necessary changes are made to enhance the efficiency of M&E systems.

2.2 National Systems for the M&E of Government Interventions

In Pakistan, Government projects and programmes undergo five stages, i.e. identification, preparation, appraisal / approval, implementation, and monitoring and evaluation. In the public sector, monitoring is considered a continuous process of observing and examining ongoing activities and tasks. Monitoring assumes great importance in identifying the structural and non-structural leakages, loopholes, and other shortcomings that can be rectified to avoid the misallocation, loss and wastage of resources. It ensures timely completion of projects within the approved cost, scope and time schedule. Evaluation, on the other hand, is episodic and intermittent, commonly taking place at the beginning, middle and end of the project (Planning Commission of Pakistan (2010)). Monitoring and evaluation complement and substantiate each other to provide timely information and feedback to policymakers, implementers and other stakeholders. Results of the monitoring and evaluation activities are used to improve planning, implementation and the quality of the service delivery.

2.1.1 The Monitoring Process

In the public sector, monitoring is categorised into internal and external monitoring with statuary guidelines. Internal monitoring is carried out by agencies involved in project formulation, appraisal / approval, and implementation, who ensure the successful and timely completion of the project. External monitoring provides information about project progress to higher authorities, and takes place in close coordination with internal monitoring systems and agencies. The internal monitoring unit supports the external monitoring unit by providing the necessary information (including special review reports), collecting information through field visits, and counter-checking the validity of information.

(a) Indicators

Within government projects, indicators are used to measure the degree to which a project is contributing to its desired goals or targets by achieving certain objectives. They are a tool to help measure change. Indicators are generally categorised into input, process, output, outcome, and impact indicators, but during monitoring the focus is on input and process indicators. Public sector project monitoring makes use of primary and secondary indicators, which cover socio-economic, financial, physical, and environmental[2] aspects, as shown in the table below.

Table 4: List of Monitoring Indicators

Type	Indicators
Primary Indicators	
Completion of preliminaries	Drawing, designing, tendering
Financial utilisation	Fund allocation, releases, and item-wise cost utilisation
Physical progress	Approved work scope and time schedule Staff and equipment usage rate
Managerial performance	Timely decisions, efficiency and controls, inventory level, rate of progress,

[2] It is been observed that some indicators have been developed and used for environment, but no such indicators have been developed for climate change and particularly climate change adaptation.

	labour and other issues
Secondary Indicators	
Economic parameters	Capacity utilisation, crop production, intensity, yield, growth rate,
Social parameters	Income distribution index, availability of basic needs,
Environmental parameters	Pollution, climate consideration, etc.
Technical/qualitative parameters	Quality control standards, input usage rate, credit supply, extension services (transfer of knowledge and technology with adoption rate etc.)

(Source: Planning Commission of Pakistan (2010)**)**

(b) Method and Techniques

The choice of methods or techniques for project monitoring depends on their usefulness, effectiveness, and ease in measuring project progress. Depending on the requirements of the concerned authorities, the approved cost, scope, time schedule and objectives are considered capable tools for producing the information. For smaller projects descriptive analyses are used to report progress, but for large-scale projects, it is mandatory to use modern network methods (e.g. CPM/PERT) to plan in advance the time and resources required for completion of individual activities. It should be noted that assessment techniques vary from situation to situation and are tailored to needs.

(c) Reporting

Progress reports are produced by monitoring personnel and include all technical, economic, financial, social, and environmental aspects of the activity. These reports are shared with concerned authorities, who then give comments and recommendations to monitoring staff and project implementers. Inter-agency meetings may be called to ensure coordination across departments. Project activities are audited for projects funded by foreign aid. The aim of carrying out all these exercises is to ensure the economic efficiency, cost effectiveness, and timely achievement of defined objectives.

2.1.2 Evaluation Process

The final phase in the project cycle is project evaluation, in which the elements of success and failure are examined to learn from and plan better for the future. The basic objective of evaluation is to find out the real worth of a project through analysing the effectiveness, relevance and validity of the objectives, identifying reasons for the satisfactory or unsatisfactory accomplishment, and assessing the impact of activities in the light of the set objectives (Planning Commission of Pakistan (2010)).

(a) Indicators

As mentioned in the monitoring section above, there are different types of indicators for different stages of project implementation, and monitoring indicators are based on input and process stages. In contrast, evaluation indicators focus more on the output, outcome, and impact stages of the project. The following table classifies evaluation indicator types.

Table 5: List of Evaluation Indicators

Types	Indicators
Physical	Overall physical progress, Overall cost utilisation
Economic Indicators	Financial and economic benefits (e.g. financial rate of return, internal rate of return, benefit-cost ratio).
Social Indicators	Income distribution with equity, level of food consumption, health and education facilities, shelter, access to essential amenities / basic needs, life expectancy, etc.
Output or Impact Indicators	Production (whether crops, livestock, forest products, fish, etc.) e.g., percentage of children in a target group receiving food supplies, number of acres surveyed, loan applications processed / approved, trained manpower, a laboratory set-up etc.

(Source: Planning Commission of Pakistan (2010)**)**

(b) Method and Techniques

During an evaluation, all relevant documents are reviewed, including the approved project document (PC-I), concept clearance papers, loan / grant agreements with foreign agencies, feasibility studies, pre-approval appraisal notes / working papers, pre-approval technical scrutiny notes, sources of financial and other inputs, annual/quarterly progress reports, project review / monitoring / mid-term evaluation reports, special reports, and the project completion report. The evaluation questions relate to areas such as conception and basic objectives, design, preparation, forecasts of output or benefits, technical preparation, deficiencies in preparation and their removal, and implementation as per the plan.

(c) Reporting

Reporting the results or outcomes of the evaluation process and providing feedback is considered the most important element of a systematic and integrated approach to project appraisal, monitoring and evaluation. Feedback allows comparison of the actual outcome of the project with the projections made in its appraisal, and provides important lessons for senior management and policy-makers.

2.2.3 Results-Based Management

The Planning Commission has adopted a results-based management approach to execute the new growth framework. This will help the government ensure that its processes, products and services contribute to the achievement of desired results (outputs, outcomes and impacts). The Government of Punjab, for example, has set income growth and improved social services as its twin development objectives. It wants to adopt modern public resource management techniques to achieve its Vision 2020 (2004). To this end it is introducing a Results-Based Management Framework that links development objectives, outputs, outcomes, systems, and resources to guide reforms and monitor the progress of the province in realising its vision.

3. M&E of Climate Change Adaptation Interventions

3.1 Relevant Institutions, Frameworks and Practices within Government

3.1.1 Institutions and Frameworks

Climate change is a new subject in Pakistan, and not all government agencies are yet aware of its potential impacts in the short and term. Work on climate change has lacked a coherent and integrated approach. Moreover, climate change has not been mainstreamed and internalised into development process. Some departments have partially focused on the mitigation aspects of climate change, but adaptation has been neglected and not given due importance in policies and programs. Pakistan has one big achievement in this regard, and that is the creation of the Ministry of Climate Change as the focal ministry to deal with all activities related to the environment and climate change. Progress has been made on integrating climate change into development, but so far the government's Planning Manual, Project Cycle, and M&E framework have been not been revised. The national documents lack the indicators, tools, techniques and approaches for climate change adaptation. Some approaches and practices have been devised separately for environment and climate change projects in the focal ministry and concerned departments, but have not been incorporated into the national M&E framework and guidelines.

3.1.2 Practices within Government

(a) Sustainable Land Management Project

The monitoring and evaluation of Phase I will be carried out to identify and overcome the challenges that can be tackled in Phase II. Phase II will be developed in consultation with project partners and stakeholders. This process is underway and the phase II initiation is now in preparation. The M&E system consists of evaluation studies into the effectiveness and sustainability of the various interventions developed under the project. Since the project is funded by the Global Environmental Facility, the evaluations have been budgeted in the project funding. At the same time the required Government procedures under the planning commission's rules are also being followed.

Although both these processes are necessary to take forward a successful project, there are no systems in place to evaluate post-project effectiveness in combating climate change impacts. Moreover, the monitoring and evaluation are of a sectoral / technical nature, with little scope for measuring the socio-economic impacts in the long run. Given this situation, it will be very useful to start developing an evaluative framework based on the TAMD approach at this stage.

(b) Rooftop Rainwater Harvesting

This project has definite climate adaption benefits despite being, designed to reduce water scarcity in high altitude communities. The project also has elaborate implementation and monitoring mechanisms. With multi-stakeholder implementation, there are several M&E frameworks being applied at different scales. The planning commissions procedures are applied along with those of the various donors that have funded the project at different stages. At the same time the implementing partners (local NGOS) are required to keep audio-visual records of the project. They are also required to undertake two Knowledge, Attitude and Practice evaluations, at the beginning and end of the projects. In combination, these provide rich data-sets that could be used for a TAMD framework.

3.2 Capacity for Climate Change Adaptation M&E within Government

There are two main categories of M&E systems in Pakistan: the government M&E system and donor M&E systems. The Government M&E system, under the Planning Commission, has so far not incorporated climate change adaptation. The two main reasons for this are a) climate change and particularly adaptation are new issues and very few people have a full grasp of the subject, and b) that the M&E structure of Pakistan is generic and lacking a sectoral approach. As far as capacity is concerned, a number of institutions are involved in government staff capacity building, which includes the staff of the M&E Section of the Planning Commission. The institutions providing the training (e.g. Pakistan Institute of Development Economics, Sustainable development Policy Institute, National Institute of Management), however, do not have the capacity to include a climate change adaptation component in their courses, which are generic and designed for social and development sector projects.

3.3 Development Partner M&E Adaptation Frameworks

(a) UNDP M&E Framework

UNDP is a major development partner in Pakistan and currently finances activities ranging from those that are social and developmental to ones that address environment and climate change issues. The M&E framework of UNDP to monitor the project activities is very comprehensive and clear. It has the three components of monitoring, reporting, and evaluation.

The monitoring is a continuous process of tracking the project implementation. The National Project Director / Manager, the Ministries / Departments, the UN specialised agencies and individual consultants undertake a series of tasks. These are to: 1) construct baseline data on problems to be addressed, 2) clarify programme or project objectives and set specific targets, 3) establish stakeholders' consensus of indicators for monitoring and evaluation, 4) agree on the generation and utilisation of data, 5) specify reporting requirements, 6) establish monitoring and evaluation responsibilities, and 7)

provide an adequate budget for monitoring and evaluation. The main tools for monitoring project activities are the work plans, project progress reports and project visits.

Reporting is seen as an integral part of monitoring and evaluation, and is defined as the systematic and timely provision of essential information for decision making at appropriate management levels. It normally follows a standard format and periodicity. The third component, evaluation, is the process of systematically and objectively assessing whether the immediate objectives of the project are being achieved, and whether they are contributing to the attainment of the development objectives. The process involves stakeholders such as the government, civil society, and the private sector. The evaluations act as a management tool in decision making and learning processes, and are used for improving effectiveness of future projects.

The M&E framework does not consider the M&E of adaptation beyond the regular M&E for public accountability purposes.

(b) ADB M&E Framework

The Asian Development Bank M&E system is based on the Project Management Information System, through which periodic reports, accounting statements, statistical analysis and other related reports are produced. The system specifies the arrangements for provision of such reports and statements required for monitoring project progress. In addition monitoring is carried out through telephone calls, correspondence, and other methods as needed. For evaluation the bank carries out field missions, and considers Appraisal Reports and Loan Agreements. In ongoing evaluations during implementation phase, the field mission evaluates progress and recommends corrective actions.

The timing of evaluation is as specified in the Loan Agreement or Appraisal Report. Generally, it is annual or half yearly. The Project Completion Evaluation is based on the mission evaluation after project completion and informs the "Project Completion Report". Lessons learned are presented and serve as guidelines for improvements of future projects. Additionally, Benefit Monitoring is conducted to provide the information needed to ensure that services are not only delivered, but also result in benefits to those whom the project is intended to benefit. The delivery, use and immediate effects of services provided are monitored. Evaluation of the benefits of completed projects provides information to improve the design and implementation arrangements for future projects. Highly skilled, professional and independent consultants are hired to monitor and evaluate benefits.

The ADB M&E framework also does not consider the M&E of adaptation beyond the regular M&E for public accountability purposes.

(c) Alignment

There is no alignment yet of development partner M&E frameworks with national approaches, despite the Paris Declaration. Whilst there has been much discourse, the Planning Commission, bilateral donors, and multi-lateral agencies are committed to their individual procedures for the M&E of all socio-economic development programs.

4. Components of National Evaluative Framework for Climate Adaptation

4.1 Availability and Quality of Data on Socio-Economic Performance

4.1.1 Availability of Data and Information

Data is available from numerous socio-economic, demographic and agricultural sources in Pakistan. Some of the main data sources are summarised below.

The **Social Indicators of Pakistan** report (2011) is the sixth to be produced since 1985. It covers a wide range of socio-economic data regarding population, income and expenditure, labour force and employment, education, health, family life and leisure, public safety, transport and communication. The report also contains some new tables such as those on demographic transitions, communication, resource configuration, tourism, and national income. It provides national information, along with international comparisons for some key variables. It is based on the latest available data from the censuses, surveys and other secondary sources published by various organizations.

The **Pakistan Social and Living Standards Measurement Survey** provides a set of district level population-based estimates of progress against social indicators. In the sixth survey (2010-11), 76,546 households were covered over the entire country, and information was collected on a range of social issues. This was primarily focused on the main sectors of education, health, household assets / amenities, immunisation, pre/post natal care of females, and household satisfaction with facilities and services, in the overall context of Millennium Development Goals. Data was disaggregated by province / district, by region (urban-rural) and by gender.

The **Household Integrated Economic Survey** has been carried out intermittently since 1963, with modifications made to address the requirements of new systems of national accounting. It has been split into two modules in order to obtain a better quality of information independently from male and female respondents by using male and female enumerators. Field work for the current survey started in July 2010-11 to study both social as well as economic indicators. The survey report provides important data on household income, consumption expenditure and consumption patterns at national and provincial level with an urban / rural breakdown.

The **Pakistan Statistical Year Book** is one of the annual publications of the Federal Bureau of Statistics. It has been issued since 1952. The 2011 issue seeks to provide a comprehensive overview of different socio-economic aspects of the country for the financial year 2009-10. It includes data for the last ten years relating to climate, population, labour force, education, health, national accounts, agriculture, energy and mining, manufacturing, transport and communications, money and credit, public finance, prices, trade, balance of payments, foreign economic assistance and development planning. Efforts have been made to redesign the statistical year book to meet the rapidly increasing requirements of policy makers, researchers and other data users in both public and private sectors.

The **Agricultural Statistics of Pakistan** (2010-11) is currently in its 44th volume. After the devolution of the Ministry of Food and Agriculture the function pertaining to agricultural statistics has been transferred to the Pakistan Bureau of Statistics. The publication provides all sorts of data relating to agricultural sector, including area, production and yield of crops. The data for the period from 1993-94 to 2010-11 has been provided for a time series analysis.

The **Labour Force Survey** is one of the most visible and sought-after works of the Federal Bureau of Statistics. The Labour Statistics Section plays a key role in orchestrating the logistics of survey activities. This comprises framing the questionnaire, working out the methodology, and determining the design, size and spread of the sample. It also includes printing and distribution of questionnaires to enumerators, training field staff, collecting, editing, coding and processing data. The section also writes the reports and disseminates them through published and electronic means.

The **Pakistan Economic Survey** is published every year and provides data on economy, agriculture, development, trade, environment, growth, money, debt, taxes, inflation and other sectors. It provides the latest data and information to researchers, academics, and policy makers about different sectors of the economy. It is a well-used and reliable document for all types of socio-economic data and analysis.

The **Pakistan Energy Year Book** is a detailed annual document that provides data on the energy situation in Pakistan, such as regarding demand, supply, price, and overall energy mix. This data is used for different types of research and analysis for energy management and future planning.

The **Millennium Development Goals** are the centrepiece of development efforts by the Government of Pakistan. The Goals have been incorporated into two important macroeconomic Government frameworks: the New Growth Framework which focuses on inclusive growth and increasing total factor productivity, and the Poverty Reduction Strategy Paper which is a framework for social and economic policies. To date, sufficient progress has only been made on about half of the targeted indicators.

4.1.2 Quality of Data and Information

Quality of data in Pakistan is fairly good, but has a few shortcomings. The following factors need to be considered.

Methodology. Data quality depends very much on the methodology used to collect it. This includes the tools, techniques and approaches adopted, and the sampling techniques used. In Pakistan a fair amount of work has been done on methodological issues, including the preparation of guidelines and the training of data collectors. In most cases the data collection methodology is not presented along with the data, thereby creating doubts about the reliability of data.

Process. There are certain crucial aspects of the data collection process that need attention, including fairness and unbiasedness, integrity in data collection, data storage, synthesis, precise and correct interpretation, true data reporting and presentation. In Pakistani data systems, all these aspects are considered while collecting and processing the data. However, it is worth stating that the data collection process is informal, with involvement of third parties who may or may not take care of the details to

ensure standards are met. Additionally, although there is constitutional support, there are no regulatory measures and policies at the micro level during collection.

Skills. The skills of data collection staff are an extremely important component of data collection. Skill means the ability to collect the right information using right set of techniques, thereby minimizing bias and enhancing efficiency. In Pakistan, the traditional practice for data collection is that enumerators are hired and trained on a short-term basis to conduct surveys. They posses basic qualifications and know about the data collection process, but do not have the technical knowledge of the issues for which data is being collected. There are very few data collection organizations in Pakistan and they often work for international agencies and private organizations.

4.2 Appropriate M&E methodologies

The national M&E system is described in 2.2 above.

5. Good Practice and Challenges

5.1 M&E Good Practice

The data collection and management system in Pakistan is comparatively efficient, reliable, and updated. The Pakistan Bureau of Statistics oversees and monitors all aspects of data collection and management. The national data system comprises data from a number of different sources. A strength of the system is that it is very detailed and covers a wide range of issues from all parts of the country; no other private or non-government agency can maintain and update such a huge data base. Some surveys are conducted every year to gather together the latest information on a range of socio-economic issues.

There is a comprehensive M&E process in place with several mechanisms to ensure the quality of monitoring and evaluation activities. A strength of the M&E system is that the collected monitoring or evaluation information of any project is shared with all concerned individuals and departments, and they, in turn, are asked to comment on the value of the activities. All stakeholders can thus be involved in enhancing the efficiency and effectiveness of developmental activities. It is a strength that the shortcomings of the system are recognised and efforts are being made to remove them and invest in updating the data sets.

5.2 M&E Challenges

There are a number of constraints and limitations in the conducting of M&E in Pakistan. There are real limitations to the data quality, and the monitoring and evaluation systems currently in use. Key limitations are outlined below.

National M&E systems. There are weaknesses exhibited by the current M&E systems. First, there are many tools, techniques and approaches that have been adopted in theory but are not taken up in practice. A large number of changes, modifications and manipulations are made. Secondly, involvement of too many people in project assessments can result in problems with inconsistent and contradictory opinions, wasting of time and resources, tiresome processes, and staff apathy. There are many modern approaches and technologies for M&E that have not been adopted. Input, process and output indicators are sometimes developed and used, but outcome and impact indicators are rarely applied or analysed. The main reason for this is that once the project is implemented and starts yielding results that fulfil the immediate desired objectives, authorities reduce their attention. And this is one reason for the long-term failure and unsustainability of public sector projects.

Data quality. It is very difficult to collect detailed and reliable information, because projects have many dimensions and detailed investigation of all dimensions requires the knowledge of the latest techniques and practices. In some cases inconsistencies, shortcomings and mismatches can be found in the data.

This is because of the large size and diverse nature of the data, the cost of data and information management, the limited skills and knowledge of the data collection staff, and the use of comparatively weak tools and technologies.

Staff capacity and skill development. The limited expertise in relation to data collection leads to inadequacy and inaccuracy at different levels for data collection, storage and management. Only a few organizations have staff competent to deal with data collection and management. To address the lack of capacity for data management, there is a need to incorporate the subject into academia, and introduce short-term courses and postgraduate diplomas.

Data incompatibility. A number of agencies and research institutions are involved in data collection, and most of the data produced by these agencies are not congruent with each other. This is because of the variation in data collection techniques, sampling sizes and methodologies. The incompatibility or overlaps in data often create confusion for researchers.

Expertise and integrity. M&E activities require in-depth knowledge, the taking of responsibility, a sense of ownership and room for innovation; none of which are present. Involvement of non-technical people at decision-making levels is also problematic for effective, efficient and fair evaluations of the projects and programmes. The independence of monitoring staff plays a pivotal role in presenting the true picture of work on the ground, but sometimes staff have to bow to bureaucracy and power.

Timelines. Incompatibility of dataset time frames is another issue. When variables are picked from multiple data sources, their inconsistency with respect to the timeframe affects the comprehensiveness of analysis.

Information communication technologies. In data collection and management, intensive use is made of information communication technologies, such as the internet, telephone and email interviews. Such technologies have the potential to reduce the transaction costs and produce precise results, but unfortunately they can not be fully utilised in Pakistani data collection at large scale. Such technologies can only be useful for enhancing quality, cross checking, and covering certain areas of data.

6. Conclusions with respect to TAMD Development

Since there is no separate M&E system for climate change and adaptation interventions in Pakistan, the role of the TAMD framework can be very significant. It could be crucial for mainstreaming and internalising climate adaptation into the development process. It can help integrate and synchronise different strands of the development process and climate change adaptation activities. Another means of making development and climate change congruent is to develop an M&E system for climate change, which detects the scale and intensity of interventions, and investments for climate change adaptation.

In this situation it would be opportune to develop a TAMD-based evaluation system for one or two prototypes in Pakistan. The prototypes would test the feasibility of developing such a framework. They would also identify data and procedural gaps that would need to be overcome to make the framework operational. A mix of project, statistical and some primary data may need to be collected to make socio-economic-based adaptation evaluations.

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Project materials

Climate change

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