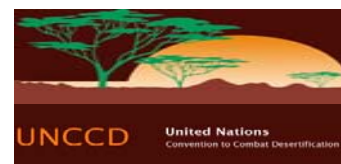




Government of Pakistan
Ministry of Environment
(Forestry Wing)



Implementation of UNCCD and NAP in Pakistan

(Third Assessment 2006)

January 2007

Executive Summary

Pakistan is an active member of the international UNCCD Community and striving hard to implement priority programme areas as envisaged in National Action Programme to Combat Desertification. Indeed Pakistan has a long history of organizations dealing with land and water reclamation and management issues; most of them work in provincial jurisdiction. They include Agriculture Departments (Agriculture Engineering, Soil Conservation Wings), Forest Departments and Irrigation Departments and Agency for Barani Area Development (ABAD). At Federal level, Ministry of Environment, Ministry of Food, Agriculture and Livestock, Ministry of Science & Technology, Ministry of Water & Power and Ministry of Defence (Pakistan Meteorological Department) have been implementing various policies and programmes aimed at sustainable land water management. All of these provincial and national institutions were identified as major actors in implementation of NAP. Post – NAP (2002) era has seen a revolutionary change as they started assuming the form of an institutional network. Consultation and coordination among themselves and with the international counterparts have intensified during the last few years. Some organizations like Pakistan Metrological Department and Pakistan Council for Research in Water Resources have designated Focal Points to deal with Desertification issues. Role of national and local civil society organizations is gradually increasing right at planning stage to field implementation of desertification control programmes and projects. R&D institutions and academic have initiated research and education programmes in different programme areas of NAP.

Ministry of Environment, as Focal Point for UNCCD in Pakistan, is working on different fronts towards fulfilment of its commitments under UNCCD and NAP. National Environment Policy (2005) and National Sanitation Policy (2006) have already been promulgated which have main provisions for sustainable water and land resources. National Land Use Plan (under preparation) will further safeguard land resources against mismanagement. Forest Policy is under consideration of the Cabinet and national action plan of Forestry Sector has been launched to achieve MDG (2015) target to bring one million hectares of new land under forest cover. A mega initiative taken by the Forestry Wing of Ministry of Environment is the launch of “Sustainable Land Management Project” in 2007 with the GEF/UNDP grant assistance.

The 3rd Assessment Report has been prepared after thorough consultation with the potential stakeholders. During the validation workshop held at University of Arid Agriculture Rawalpindi on 25 January 2007, the participants unanimously recommended re-constitution of NCCD and holding of its meeting twice in a year for effective supervision, advice and assessment of NAP implementation. Consequently, NCCD has been revised with inclusion of NGO coordination group. Pakistan, as the host country for TPN-6, is progressing towards fulfilment of its commitments on regional enabling policy to support local area initiatives.

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1. Details of UNCCD Focal Point	
Focal point institution:	Ministry of Environment, Government of Pakistan
Name of focal point	Dr. Bashir Ahmed Wani, Inspector General Forests
Address including e-mail address	Wani48@hotmail.com , bashir.wani@gmail.com
Country-specific websites relating to desertification	www.slmpt.org , www.pakmet.org

2. Status of National Action Programme to Combat Desertification in Pakistan	
Authority and Date of validation of the NAP	National Action Plan to Combat Desertification in Pakistan was approved by Ministry of Environment in 2002
NAP review(s) Date(s)	Review of relevant sections of NAP is under review with the Ministry of Environment and NAP implementing partner agencies
NAP has been integrated into the poverty reduction strategy	Pakistan Poverty Reduction Strategy (PRSP), has integrated NAP's programme areas of sustainable use of natural resources as means towards poverty alleviation
NAP has been integrated into the national development strategy	Yes. Various priority programme areas of NAP are integrated into development sector strategies and policies
NAP implementation has started with or without the clusions of partnership agreements	Establishment of partnership agreements in implementing NAP is still infancy. However, most of the multi-sectoral programmes and projects aimed at combating desertification include a number of implementing partners with pre-decided partnership agreements established between them.
Final draft of a NAP exists	Yes. Final draft was approved by Government of Pakistan and submitted to UNCCD Secretariat in 2002. A concise version is available on UNCCD website.

3. Member of SRAP/RAP
South Asian Sub-Regional Action Programme (SA-SRAP) was formulated in Colombo, Sri Lanka in 2005. Pakistan, as a member of SA-SRAP, is planning to initiate joint activities with other member countries, particularly in the fields of capacity building, and regional R&D.

4. National Coordination Body on UNCCD

National Coordination Committee on Desertification (NCCD) is a 19-member, inter-ministerial and inter-departmental body in the Ministry of Environment. The NCCD was constituted in 1998 and revised in 1999 and comprises of representatives from the provincial Agriculture Departments, heads of federal units dealing with the research, management and development of natural resources including land, water, forests and wildlife. Rural support programmes, rural development agencies, NGOs, and academia are also given due representation in NCCD.

The participant of the consultative workshop on 3rd assessment report have unanimously recommended re-composition of the NCCD giving due representation to non-government sector and holding of ordinary meeting at least twice in year. The revised composition is given in Annexure-I.

5. NGOs accredited to the process of NAP implementation

Rural Support Programme Network (RSPN) is designated as Host Institution for TPN-6, whereas National Rural Support Programme (NRSP) is the Task Manager. Under TPN-6, various activities including “Regional Enabling Policy Study on Local Area Initiatives” and TPN-6 website are currently underway.

6. Total number of acts and laws passed relating to the UNCCD

1. **Pakistan Environmental Protection Act 1997 and regulation thereof entitled “Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations (2000):** The Act and its regulations bind all agencies and individuals to conduct detailed IEE/EIA under the prescribed procedures before commencement of any land-based project.
2. **Forest Act 1927:** The Act contains provisions for declaration of forests, and protection of forest produce. Forest Act 1927 applies to State-owned Reserved Forests, Protected Forests, Communal Forests and Privately-owned lands managed by the Forest Departments for the sake of land rehabilitation.
3. **Land Revenue Act 1963:** The Act species the procedures for demarcation of arable, rainfed and wastelands and collection of revenue on the basis of land productivity classification.
4. **Pakistan Wildlife Protection Act 1974 and Provincial Wildlife Acts 1975:** Although the focus of Wildlife laws are threatened wildlife species, yet they speak specifically on protection of wildlife habitats and ecosystem as a whole. Under the Wildlife legislation, Pakistan has declared 19 national parks and more than 200 protected areas which relate directly to the cause of desertification control.
5. **Model Forests and Wildlife Laws (under preparation):** National and provincial governments are preparing model wildlife laws in their respective settings, with the prime aim of integrating local communities in management of biodiversity resources.

7. Consultative Process

1. The consultative process started while compiling NAP and second national report to UNCCD. Consultation among key stakeholders and particularly implementing agencies of UNCCD and NAP in Pakistan gained momentum after 2003. Ministry of Environment organized several events during the last two years primarily to invoke the process of consultation the key issues and solutions relating to desertification. Five consultation workshops have been organized during 2005 under GEF-funded Sustainable Land Management Project (SLMP). These provincial consultative workshops were held in Islamabad and provincial capitals Lahore, Karachi, Peshawar and Quetta and provided opportunities for disseminating the Convention and the NAP to key implementers and also for negotiating on the respective roles of stakeholders in implementing different programme areas of NAP.
2. UNCCD, CBD and UNFCCC are presently working on modalities for building synergistic actions towards the fulfillment of objectives of all the three Rio Conventions. Ministry of Environment, with the UNEP assistance organized a consultative workshop on building synergies between Rio conventions at Islamabad in February 2006. Besides, IUCN-Pakistan in collaboration with leading national NGOs has organized a consultative workshop to mark the World Environment Day on 5 June 2006, while specifically focusing on desertification.
3. Many key organizations including Pakistan Meteorological Department and Pakistan Council for Research in Water Resources (PCRWR) have designated desertification focal points to coordinate and liaise with partner organizations. PARC has designated Rangeland Research Programme (RRP) as focal point to deal with UNCCD related affairs. They have effectively started in-house consultations and are interacting with relevant national and international organizations. PARC is focal point for ICARDA, CIFOR, CGIAR, IWMI, ICIMOD, and CSIRO in Pakistan and has organized consultative workshops on various issues concerning desertification in collaboration with international counterparts.
4. The fourth international workshop of the joint UNESCO-UNU-ICARDA-Flanders Project on "Sustainable Management of Marginal Drylands (SUMAMAD)" was held in Islamabad (Pakistan) from 26 January to 1 February 2006. The workshop was organized by the Pakistan Council of Research in Water Resources (PCRWR) and UNESCO Headquarters as well as its Islamabad Office within the context of the UNESCO Man and the Biosphere (MAB) Programme and the UNESCO International Hydrological Programme (IHP), and in collaboration with the United Nations University – International Network on Water, Environment and Health (UNU-INWEH) and the International Centre for Agricultural Research in Dry Areas (ICARDA).
5. Ministry of Environment and other organizations e.g. PARC are entering into new agreements with international partners organizations like ICARDA. Negotiations with GEF and GEF implementing agencies WB, UNDP and UNEP are ongoing on different fronts. Ministry of Environment is implementing GEF sponsored "Sustainable Land Management Project" to be administered by UNDP, while PARC is moving ahead to negotiate for UNEP node of GEF. On the other hand, provincial governments of Punjab and NWFP are implementing mega projects with ADB and IFAD loan assistance for promoting sustainable land management in Barani areas of Pakistan.

8. Projects recently implemented or currently under implementation to achieve the objectives of UNCCD and NAP				
Project	Within NAP Frame work	Implementing Agencies	Time Frame	Funding source and cost
Environmental Rehabilitation in NWFP and Punjab (ERNP)	No	Punjab Forest Department NWFP Forest Department	1997-2002	European Union Government of Punjab \$ 20.0 m
Barani Village Development Project (BVDP)	Yes	Agency for Barani Areas Development	1999-2007	IFAD Government of Punjab \$ 25.1 m
NWFP Barani Area Development Project (BADP)	No	Government of NWFP	2003-2009	IFAD, ADB Government of NWFP \$ 98.7 m
Southern Federally Administrated Tribal Areas (FATA) Development Project	Yes	Government of NWFP	2002-2009	IFAD Government of NWFP \$ 21.8 m
Dera Ghazi Khan Rural Development Project (DGK – RSP)	Yes	Government of Punjab NRSP	1999-2006	ADB Government of Punjab \$ 40.0 m
Increasing Rangelands (Barani) Productivity through Rangeland Improvement and Mitigate Poverty	Yes	Sindh Forest Department	2003-2008	Government of Sindh \$ 6.0 m
Combating desertification in Riverine forests of Sindh	Yes	Sindh Forest Department	2005-2008	Government of Sindh \$ 2.0 m
Revamping rangelands with participation of stakeholders	Yes	Cholistan Range Management Division, Punjab	2005-2008	Government of Punjab
Control of Hill Torrents in Dera Ghazi Khan	Yes	Soil Conservation Directorate	2003-2006	Government of Punjab \$ 1.4 m
Establishment of Water Recharge System through Construction of Mini Dams in Valley Soon Sakesar and Mohar Area of District Khushab	Yes	Soil Conservation Directorate	2004-2006	Government of Punjab \$ 0.3 m
Pastoral Livelihood Support Programme by SCOPE	Yes	SCOPE	2000-2006	\$ 30,000
Creating Asset for Rural Women	Yes	SCOPE	2000-2006	\$ 50,000
Water Harvesting Programme in Sindh, Kohistan	Yes	SCOPE	2000-2006	\$ 65,000

9. Integration of National Action Programme to Combat Desertification with Strategies & Plans of Economic, Development and Environment sectors

9.1 Revisiting objectives of National Action Programme (NAP) to Combat Desertification in Pakistan

Before reviewing the status of NAP's integration with other national plans, it is worthwhile to revisit the objectives of the NAP. The aim of "National Action Programme to Combat Desertification in Pakistan" is to identify the factors contributing to the process of desertification in Pakistan and suggest measures and strategy, using an integrated and coordinated bottom up approach to combat desertification and mitigate the effects of drought. Specific objectives of NAP include:

- Indicating programme areas for initiating projects/activities to address desertification.
- Providing a guideline/framework for sustainable development of natural resources in areas of prone to desertification.
- Alleviating poverty and improving living standards of people of arid lands by adopting improved technologies and having access to extension and support services.
- Providing an institutional mechanism at various levels for implementing action programme, formulating policy and conducting research in arid lands.
- Human resource development through capacity building and creating awareness among masses for identification and addressing area-specific problems.
- Gender-balanced decision making and effective participation through the recognition of the economic value of women's work.

9.2 Priority Programme Areas of NAP

Pakistan's NAP has prioritized some programme areas which have to be pursued towards the achievement of the Convention, which are:

- (1) Desertification Assessment through GIS and remote sensing techniques
- (2) Sustainable Range Management through community participation in various ecological regions
- (3) Amelioration of saline / sodic soils and improvement of drainage system to enhance crop production
- (4) Implementation of sand dune stabilization techniques / technologies in sandy deserts of Pakistan through integrated approaches
- (5) Improving water recharging and water use efficiency in water scarcity areas
- (6) Improvement of Rod Kohi irrigation system through innovation techniques and indigenous technologies
- (7) Rehabilitation of mangroves forest resources through improved management practices
- (8) Conservation and sustainable use of biodiversity for increasing the productivity of natural resource base

9.3 Harmonization of Sustainable Development Strategies, Plans and Programmes

After revisiting the objectives and priority programme areas of NAP, some evident correlations with other national strategies and plans can be found as follows:

9.3.1 National Land Use Plan (NLUP)

Pakistan has a limited resource of productive lands falling in arid, semi-arid & sub-humid tracts. In the past, large scale mismanagement of arable lands, rangelands and forestlands and alienation of land use without scientific planning lead to persistent loss of productivity, particularly of private and communal lands. Government of Pakistan realized that promulgation and implementation of national land use plan is the ultimate solution to the problems of land degradation and launched a project entitled "National Land Use Plan". The Plan seeks to facilitate the Provinces and other land planners and managers in achieving the objective (ii) of the NAP. NLUP is establishing large scale spatial databases relating to different features of land including land productivity and factors inducing desertification. Presently, Ministry of Environment is analyzing relevant spatial data (Remote Sensing and GIS based) on the highest available resolution and computing land-based statistics to incorporate into NLUP. The Plan is expected to be completed during 2006-07.

9.3.2 National Forest Policy & Derivative Provincial Strategies to achieve MDG Targets

The process of consultation with stakeholders on National Forest Policy (NFP) was completed in the year 2005 and the draft NFP is under consideration of the Federal Cabinet for approval. The Policy seeks to achieve the target as committed by Pakistan under MDG i.e. increasing the area under forest cover from existing 4.8% to 6.0% by the year 2015. Ministry of Environment is facilitating Provinces in preparing their respective strategies and plans to achieve their respective targets. Since sustainable management of biodiversity and natural resource base are the priority programme areas envisaged in NAP, implementation of forestry strategies and programmes will ultimately help achieving the objectives of NAP. These strategies are specifically targeting dry land afforestation through water conservation techniques, protection and development of mangroves and re-designing of irrigated plantations in the wake of decreasing supplies of irrigation water, primarily for reversing desertification and improving socio-economic conditions of dependent and custodian communities.

9.3.3 National Environment Policy (2005) and derivative Action Plan

National Environment Policy (NEP) was promulgated in 2005 which covers both brown and green sectors. The provisions of NEP (2005) are deeply inspired by Pakistan's obligations under MEAs, particularly UNCCD. In order to implement the NEP (2005), Ministry of Environment has prepared a comprehensive Action Plan, assigning responsibilities to the concerned stakeholders within the allocated financial resources and given timeframe. The action plan for Green sector is specifically focusing on rehabilitation of denuded watersheds and soil conservation, afforestation/reforestation of better state-owned and private lands and conserving wildlife and biodiversity resources. Financial outlay for a 25 year Action Plan of Green Sector is Rs. 50 billion (approximately \$ 800 million). Successful implementation of NEP (2005) Action Plan will tend to achieve the ultimate objectives of NAP.

9.3.4 National Environment Action Plan – Support Programme (NEAP-SP)

National Environment Action Plan (NEAP) is a multi-donor, national level Plan covering 4 core areas namely:-

- Clean Water
- Clean Air

- Energy Efficiency
- Ecosystem Management

In order to achieve the objectives and targets of NEAP, Ministry of Environment is implementing a support programme has been started with UNDP assistance. Main objective is to facilitate the potential NEAP partners including Provinces and other agencies in the preparation of programmes and projects in the four core areas. NEAP-SP's sub-Programme on Ecosystem Management has taken various initiatives towards promoting participatory in NRM in line with the objectives of NAP. UNCCD and NAP are completed integrated into NEAP-SP's sub-Programme on Ecosystem Management.

9.3.5 CDM Strategy under Kyoto Protocol (2005)

Immediately after ratifying Kyoto Protocol in January 2005, Pakistan prepared a CDM Strategy indicating prospective areas of CDM application with a mechanism to implement CDM Projects. Afforestation/reforestation and land use have been identified as forests/potential sectors of carbon sequestration with secondary benefits of rehabilitating degraded lands and economic uplift of local people through monetary gains. These objectives are strictly in line with the objectives of NAP. Successful implementation of CDM Projects in near future in A/R and LU sub-sectors will achieve the objectives of NAP and build synergy between UNCCD and UNFCCC/Kyoto Protocol. A nation-wide CDM capacity building programme is due to be launched in 2007 with the World Bank assistance.

9.3.6 Provincial and District Conservation Strategies

In continuation of National Conservation Strategy (1992), Pakistan prepared Sarhad Conservation Strategy, Balochistan Conservation Strategy and Northern Areas Conservation Strategy. These Provincial Strategies address and provide guidelines and measures to:-

- Treat social causes of environmental degradation
- Conserve natural resources to including forests, water, soil and wildlife
- Involve community in decision making and
- Raise public awareness without conservation and sustainable development.

Although these provincial strategies were prepared before the "NAP to Combat Desertification in Pakistan", yet these strategies were prepared in line with the national obligations under UNCCD, particularly in addressing issues of drylands, deserts and dry temperate mountainous regions of Balochistan, NWFP and Northern Areas. Implementation of respective conservation strategies is simultaneously achieving the objectives of NAP.

9.3.7 WAPDA's Vision 2025

Irrigation water supplies are diminishing persistently in the wake of global warming, extended droughts and expansion of irrigated lands. Third Assessment Report published by Intergovernmental Panel on Climate Change (2001) has predicted that by 2050, the mean flows of Indus River will be diminished by 27%. Economic Survey of Pakistan (2005-06) has shown that per capita water availability has already dropped drastically from 1200 to 853 m³ per annum

during the last 6 years. In order to sustain irrigated agriculture and to ensure food security for 160 million population, development of water storages is the top ranked priority of the Government of Pakistan. Water & Power Development Authority (WAPDA) is the national agency which is its Visionary Plan to construct many large dams by 2025. The motive behind this strategy is to mitigate adverse impacts of climate changes (droughts & floods) and to halt the process of desertification. Prospective impacts of this strategy on downstream ecology and environment is debatable, yet WAPDA's Plan is in line with the objectives of NAP. Following major water resource development projects under construction by WAPDA will store an addition of 11.0 MAF of water and increase irrigation command area by more than 2.0 m acres at an estimated total cost of \$ 10 billion:

- Gomal Zam Dam (NWFP)
- Greater Thal Canal (Punjab)
- Raine Canal (Sindh)
- Kachhi Canal (Balochistan)
- Mirani Dam (Blochistan)
- Sabakzai Dam (Balochistan)
- Raising of Mangla Dam by 30 ft (AJK)
- Satpara Dam (Northern Areas)
- Kurram Tangi Dam (NWFP)
- Diamer Bhasha Dam (NWFP)

WAPDA other programme areas seek to improve water use efficiency, minimize water conveyance losses, reclaim waterlogged and saline/sodic soils through improved water management, hence the objectives and programme areas of NAP are completely integrated with WAPDA Vision Plan 2025. WAPDA in its long term strategy is trying to accommodate fresh water needs of downstream ecosystems including deltaic mangroves.

9.3.8 Poverty Reduction Strategy (2001)

Poverty is considered to a root-cause of an array of environmental problems, particularly those associated with mismanagement of land and water resources and leading to desertification. Poverty reduction has become an integral component of Public Sector Development Programme, in particular development projects of forestry, agriculture, range management and sustainable land management sectors. Planning Commission of Pakistan has assumed the responsibility of ensuring integration of poverty reduction in public sector development programmes and projects in line with the national priorities as set in related programmes including NAP to Combat Desertification.

Poverty Reduction related expenditure since the adoption of PRSP (2001) is \$ 3 billion, \$ 3.3 billion, \$ 4.2 billion, and \$ 5.2 billion respectively for the years ending June 2002, 2003, 2004 and 2005. For the current year 2005-06, budget for poverty reduction activities is \$ 6.2 billion. Major activities undertaken in PRSP include community services, human development, rural development, safety nets and governance. Some important components of rural development

are irrigation and land reclamation which altogether receive 7-10% of total budget allocated for poverty reduction strategy. In that context, NAP's objectives and priority areas are integrated with PRSP.

9.3.9 Mid-Term Development Framework (2005-2010)

This is a 5-year Plan of Action accompanied by financial allocation to different development, economic and environmental sectors. Government of Pakistan has allocated more than Rs. 20 billion (\$ 330 m) to be financed for public sector projects in Environment Sector. Nearly half of this amount will be spent on Green sub-sector including forestry, biodiversity, land rehabilitation, watershed management and wildlife protection. Financial allocation for programmes of Agriculture, Science & Technology and Water sectors aiming to improve productivity of deserts, Barani lands and drylands are in addition to those allocations. MTDf (2005-2010) has recommended allocation of sufficient funds by the Government exchequer to treat global issues under MEAs including UNCCD.

10. National Focal Point and National Coordination Committee on Desertification (NCCD)

Formerly, Director General (Environment), Ministry of Environment was National Focal Point for UNCCD in Pakistan. In 2004, the responsibilities of implementing UNCCD, NAP and its programmes / projects were entrusted to Forestry Wing. Immediately after assuming the charge of UNCCD-NFP, Inspector General Forests strived hard to strengthen coordination with the UNCCD Secretariat and other national and provincial agencies for implementation of NAP. A major activity undertaken by the NFP was to initiate a GEF-sponsored PDF-B of a large scale project entitled "Sustainable Land Management Project". Under this PDF-B phase, interaction and linkages with various organizations have been established. NFP has facilitated provinces in formulating and arranging finances for different projects of forestry, watershed management, agro forestry and range management sub-sectors. Presently, UNCCD-NFP in the Ministry of Environment is sponsoring 25 provincial projects and implementing four GEF-sponsored projects, most of them are targeting drylands, Barani areas and deserts of Pakistan. The NFP is supported by two Deputy Inspector General Forests and one Assistant Inspector General Forests. However, no technical or support staff is provided exclusively to deal with UNCCD and NAP matters.

National Coordination Committee on Desertification (NCCD) is an inter-provincial and inter-departmental body convened by Ministry of Environment. The NCCD was constituted in 1998 and revised in 1999 and comprises of representatives from the provincial Agriculture Departments, heads of federal units dealing with the research, management and development of natural resources including land, water, forests and wildlife. Rural support programmes, rural development agencies, NGOs, and academia are also given due representation in NCCD. Since NFP has changed and more institutions are stepping forward to implement one or more priority programme areas NAP by designating their departmental focal points, re-constitution of NCCD has to be done shortly. During a series of consultative workshops held during the last few months, a pro-UNCCD group representing all stakeholders has emerged. They will be given representation in the renewed NCCD. The role of NCCD is pre-dominantly advisory in making policies, programmes and projects and reviewing implementation status of UNCCD and NAP.

Presently, Ministry of Environment has no provision for financial and technical resources to convene and empower NCCD and participation of members is voluntary. The Desertification Control Cell, under consideration with the Ministry, after becoming functional will be able to finance the activities of NCCD and SLMP.

11. Institutional Framework for Coherent and Functional Desertification Control

Unlike other multilateral environmental agreements which have finite number of stakeholders, UNCCD seeks to involve a wide spectrum of stakeholders from international through national to grass-root levels. Moreover, the sectoral canvas of UNCCD is extremely broad involving all institutions concerning with land management, land reclamation, soil conservation, water resources, irrigation, forestry, agriculture, range and livestock, meteorology and drought management. Besides, social and financial sector institutions, both governmental and non-governmental operating in deserts and dryland areas are also regarded as key facilitators in sustainable land management and control of desertification. Federal Ministries, provincial departments, local governments, community organizations, non-government organizations, R&D institutions, and academia are all players in implementation of UNCCD in Pakistan.

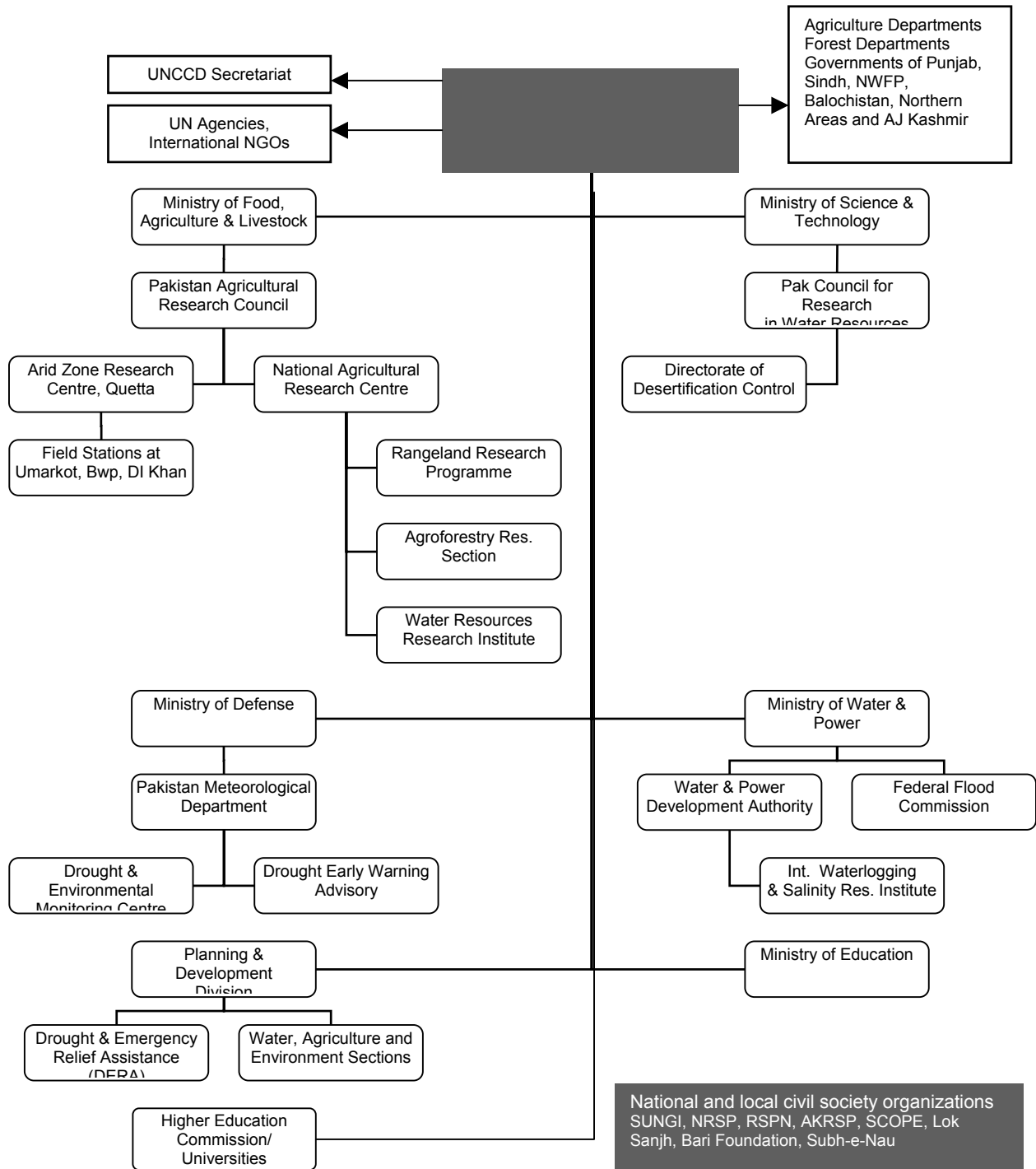
Before the promulgation of NAP, all of these institutions at national, provincial, district, local and grass-root levels, had been traditionally providing services towards increasing productivity of lands and halting the process of land degradation. However, their plans, programmes and projects were being implemented in isolation independent of each other. Post –NAP period (from 2002 to date) has seen a new trend i.e. frequent consultation between different stakeholders and joint initiatives on combating desertification. Within a few years, these institutions, their concerned professional or designated focal points, have started frequently interacting with each other and fast assuming the form of a national network on UNCCD and NAP as illustrated in the following flow chart diagram.

11.1 Federal Institutions

Ministry of Environment, being the focal Ministry for UNCCD, interacts with the Secretariat, represents Pakistan in COPs, CRICs, CST, reports on the implementation status of UNCCD and NAP and on other obligations under the Conventions. The Ministry negotiates with GEF and UN agencies implementing GEF's financial mechanism. Parallel to these interactions, the Ministry coordinates with the provinces and their respective departments which are identified as key implementing agencies of NAP programme areas. Another responsibility the NFP is assuming is to arrange finances for the provinces to implement their projects that meet the objectives of UNCCD and NAP. Other ministries that are UNCCD implementing partners of Ministry of Environment are Ministry of Food, Agriculture & Livestock, Ministry of Defense, Ministry of Science & Technology, Ministry of Water & Power, Ministry of Education and Planning & Development Division (Ministry of Finance)

These ministries have secured their main stakes in the Convention and NAP through their attached departments, as shown in the diagram. Similarly, the provinces are influencing NAP implementation through their regional and local departments. Key provincial departments are enlisted after the diagram.

Illustration of institutional framework to implement UNCCD and NAP in Pakistan



11.2 Provincial Institutional Framework

In the provinces of Punjab, Sindh, NWFP and Balochistan, Northern Areas and Azad Jammu & Kashmir, Agriculture Departments are mainly responsible for implementing respective programme areas of NAP in their jurisdiction. The Secretaries, being the administrative heads of Agriculture Departments, are given membership in NCCD. Besides, Forest Departments of all provinces, and particularly their wings dealing with soil conservation, watershed management, sand dune management and range management are part of the provincial institutional network. Some other provincial institutions which are identified as major implementers of NAP are as given below:

- Agency for Barani Areas Development (ABAD), Rawalpindi, Punjab
- Cholistan Development Authority, Punjab
- Directorate of Soil Conservation, Rawalpindi, Punjab
- Cholistan Institute of Desert Studies, Islamia University, Bahawalpur, Punjab
- Shah Latif University, Khairpur, Sindh
- Provincial Units of Drought Emergency Relief Assistance Programme (DERA) in all provinces

11.3 Non-governmental Organizations

During the last few years, a large number of non-government organizations have undertaken local area initiatives focusing on sustainable land management. During the previous national reports of Pakistan, actual achievements of non-government, non-profit, civil society organizations were not reported adequately. International, national and local NGOs which are actively contributing to achievement of NAP objectives are enlisted below:

- International Water Management Institute (IWMI)
- Agha Khan Rural Support Programme (AKRSP)
- National Rural Support Programme (NRSP)
- IUCN – The World Conservation Union Pakistan
- Worldwide Fund for Nature (WWF – Pakistan)
- Sustainable Development Policy Institute (SDPI)
- Leadership in Environment & Development (LEAD-Pakistan)
- Society for Conservation & Protection of Environment (SCOPE)
- Pakistan Institute for Environment Department Action Research (PIEDAR)
- Thardeep Rural Development Programme – Sindh
- Lok Sanjh
- Bari Foundation
- PLAN international

12. Post-NAP Achievements of Leading Institutions

Main functions of these institutions and notable achievements, particular those in line with the objectives of the Convention and the NAP, are summarized as under:-

12.1 Ministry of Environment

Inspector General Forests in the Ministry of Environment is the NFP for UNCCD in Pakistan. He ensured effective representation of Pakistan in COPs and CRICs of UNCCD. After GEF's assuming of financing responsibility UNCCD in 2003, correspondence between the NFP and the Secretariat has intensified. Ministry of Environment has organized several national level consultative workshops on different aspects of UNCCD since the approval of NAP. Pakistan became the first country to bid for GEF grant assistance to implement a national project to control desertification entitled, "Sustainable Land Management Project to Combat Desertification in Pakistan". The PDF-B phase was successfully completed and the GEF Council has cleared the project for funding of full-scale project at a cost of US \$ 17.00 million.

Ministry of Environment is also implementing three other mega projects with GEF assistance namely "Protected Areas Management Project (PAMP)," "Mountain Areas Conservancy Project (MACP)" and "Pakistan Wetlands Project (PWP)". Under PAMP, three national parks viz Chitral Gol National Park (NWFP), Machiara National Park (AJK) and Hingol National Park (Balochistan) are being scientifically managed with the participation of local communities. MACP is aimed at participatory management of selected conservancies in NWFP and Northern Areas. Pakistan Wetland Project is mandated to establish base lines and invoke management of all the major wetlands of Pakistan. These three mega projects were launched under CBD Convention, yet their implementation has achieved most of the objectives of the NAP. A "National Land Use Plan (NLUP)" is under preparation and will be launched by the Ministry of Environment in the year 2007. The ultimate goal of the Plan is to halt degradation of lands through scientific land use planning.

Government of Pakistan has allocated Rs. 20 billion (US \$ 330 million) for the Environment Sector in Mid-Term Development Framework (2005-2010). Of this allocation, nearly half is exclusively for forestry, range management, watershed management and biodiversity management. Presently, Ministry of Environment is sponsoring a large number of projects to be implemented by provincial governments and local governments. Nearly all priority programme areas, as suggested in the NAP, are covered in these Government funded projects which are being implemented in rainfed, drylands, and deserts. A list of on-going projects under Public Sector Development Programme (PSDP) in the NAP programme areas is provided in Annex .

Global Change Impact Studies Center (GCISC) was established on the directive of the Prime Minister with a mandate to conduct research on the impacts of global changes including climate change and desertification on different sectors of economy. The Center conducts high quality research on the impacts of global issues of climate change, biodiversity and desertification and provides policy advice to incorporate into respective sectoral plan & programmes. GCISC is now working as an attached department of Ministry of Environment. Another attached department of Ministry of Environment, Pakistan Forest Institute, is conducting applied research on NAP's R&D priority areas including soil conservation and watershed management, range management, irrigated forestry and dry afforestation techniques. Correspondence with universities in this regard for research is in progress.

12.2 Ministry of Defense

Major stake of the Ministry of Defense on combating desertification is through its subsidiary organization Pakistan Meteorological Department. During the last few years, Drought and Environmental Monitoring Center (DEMC) has been strengthened in the PMD primarily to facilitate concerned agencies to take necessary measures to cope with forecasted droughts. The DEMC has installed 350 additional meteorological stations to communicate real-time data to the headquarters. PMD communicates the drought-alter signals to the Home Secretaries of respective provinces to take necessary measures in the affected areas. A sample advisory note issued by Director General PMD is given in Annex .

The Centre is routinely processing high-resolution satellite for determining and monitoring desertification related indices such as Normalized Difference Vegetation Index (NDVI) and publishing on monthly basis for use by planners, managers and researchers. Thereby PMD and DEMC are the most effective implementing partners in implementing NAP's main programme areas towards achievements of its objectives. The Drought Early Warning Advisory of PMD is an implementation of NAP's Programme Area on "Drought Management" (Chapter No. 6 of NAP) which requires that drought related information has to be disseminated by PMD to all users; PMD is disseminating through internet.

Another important role the Ministry of Defense is playing in combating desertification, particularly in desert tracts of Pakistan, is through afforestation being done by field units of Pakistan Army. Although the plantations are established for strategic and environmental purpose, yet their impacts on desert lands are helping to control desertification in those areas where regular Forest Departments rarely operate.

12.3 Ministry of Food, Agriculture and Livestock (MINFAL)

MINFAL through its subsidiary body Pakistan Agricultural Research Council (PARC) is engaged on conducting applied research and various field activities in drylands, rainfed areas (barani areas) deserts, project on small ruminants and irrigated tracts. Scope of PARC is very broad covering all aspects of agriculture, forestry, watershed management, range management, irrigation, crop management, soil conservation and land use planning. PARC had assumed a leading role in preparation of "NAP to Combat Desertification in Pakistan". After promulgation of NAP, PARC is streamlining and integrating different programmes to bring in line with the objectives of the UNCCD and NAP. Following institutes of PARC are specifically implementing relevant programme areas of NAP since 2002.

12.3.1 Water Resources Research Institute (WRI)

WRI is currently in the areas of (a) Irrigation System & Water Management (ISWM), (b) Soil and Water Conservation (SWC), (c) Resource Use Planning (RUP), and (d) Rod-Kolu System Development and Management (RKS). The objective of ISWN is to improve water use efficiency through high-tech irrigation system and to utilize low quality waters. SWC is mainly concentrating on protection of mountainous areas from soil erosion through soil water storage and diversion techniques. RUP is fast emerging area of applied research of WRI. During the last years, WRI's GIS labs have developed national data on edaphic, biotic, agro-ecological and various other themes. WRI is facilitating Ministry of Environment in preparation of National Land Use Plan. WRI has recently conducted detailed studies on glaciers and Glacial Lake Outburst Floods (GLOFs) in Northern Pakistan. The GLOFs have long lasting implications on land and water resources of Indus basin. Rod Kolu System is another important programme area of NAP and WRI is actively evolving new water storage and diversion techniques to

maximize use of water originated from hill-torrents and to minimize degradation of lands from erosion and deposition of silt.

Post-NAP achievements of WRRRI during the last three years include:

- Agro-environment Digital Atlas of Pakistan
- Agro-climatic Zonation of Pakistan (based on aridity and crop growth indices)
- Determination of Seasonal Cropping Patterns
- Assessment Land Use of Pakistan (Remote Sensing based assessment in collaboration with IUCN)
- Inventory of Glaciers, Glacial Lakes and Identification of Potentially Dangerous GLOFs in HKH Region of Pakistan (in collaboration with ICIMOD)
Watershed analysis using Satellite Remote Sensing Data (in collaboration with JIRCAS)
- Rural Poverty and natural Resources Endowments in Balochistan (in collaboration with ICARDA)

Future plan of WRRRI includes:

- Preparation of Land Use Plan
- Water Management of Spate Irrigation Systems in Rod Kohi Areas of Pakistan
- Monitoring impacts of climate change on glacial resources of Upper Indus, Pakistan
- Crop area and yield estimation of wheat-cotton cropping zone
- Groundwater monitoring using Geoinformatics and modeling

12.3.2 Rangeland Research Programme (RRP)

One of the main functions of RRP is to generate knowledge and technologies for combating desertification and sustainable development and management of diverse arid lands and rangelands of the country. Range Research Programme is introducing technologies on farmer's fields to increasing the carrying of RRM capacity of rangelands of Pothowar tract.

Researching/planting of forage species on the basis of land capability is one of the successful interventions which is replicating very fast. RRM is also conducting research on depleted range resources of deserts and dry mountains of Balochistan. Major activities RRP include mass-dissemination of knowledge and technologies to farmers and livestock farmers through radio and TV, conducting lectures and demonstrations in collaboration with NGOs for farmers, supplying germplasm of nutritious fodder trees, grasses, shrubs and legumes, and collaboration with international counterparts such as ICRAF and ICARDA.

Achievements made during the last three years include:

- Strengthened and maintained national and provincial level "Forage & Pasture Research Units"
- Expended dry afforestation techniques on Government owned rangelands and farmer's fields in Thal Area.

- After selection of promising forage grasses and legumes species seed multiplication nursery has been maintained.
- Extended shelterbelt technology to reclaim denuded areas of Thal desert through continued demonstrations on Government owned rangelands and farmer's fields in Thal Area
- Maintained hi-tech forage plant nursery and multi purpose trees and shrubs nursery at NARC
- Conducted trials on exotic forage species imported through FAO
- Distributed seed/tufts of promising forage/legume species and saplings of multi purpose trees and shrubs to various end users like army farms, farmers of various ecological regions and research and development department of the country.
- Developed new projects for addressing the causes of desertification.

In future, RRP plans to strengthen the research and demonstration activities in partnership with other organizations particularly Arid Zone Research Centre, and Punjab Forestry Research Institute. Main activities will be in the areas of evaluation of nutritional values, selection of forage species for deserts, saline and water-logged soils, seed multiplication, and in-vitro digestibility.

12.3.3 Arid Zone Research Center (AZRC), Quetta, Balochistan

AZRC, an attached Centre of PARC, is involved in research in drought prone areas, focusing mainly on agronomic, horticultural, economic and management of Khushkaba areas and rangelands. AZRC's regional stations at Umar Kot (Thar Desert, Sindh), Bahawalpur (Cholistan Desert, Punjab), and Dera Ismail Khan (Arid tract of NWFP) are conducting research on local problems and disseminating their findings to the end users. The Centre is an important partner in implementing NAP, however, the scope of its interventions is very limited i.e. at farm or village level. During the last few years, AZRC's interventions have been bringing in positive change in the total productivity of water scarce areas of Balochistan, Sindh and Punjab.

12.4 Ministry of Science & Technology (MOST)

MOST initiated desertification assessment and control activities under Pakistan Desertification Monitoring Unit (PADMU) in 1982. After promulgation of NAP, MOST has become an important Government partner in implementing NAP through its attached organization Pakistan Council for Research in Water Resources (PCRWP).

12.4.1 Pakistan Council for Research in Water Resources (PCRWP)

Main functions of PCRWR are to conduct research on desertification control measures in deserts of Pakistan, to manage and develop surface and ground water resources to sustain water supplies for humans and livestock to use for rehabilitation of desertified lands. Key achievements made during the last few years include:

- Implemented a mega R&D project entitled "Mitigation of Drought Disasters in Cholistan Desert by Management of Water Resources" at a cost of \$ 2.5 m sponsored by Government of Pakistan. In this project, 92 water storage reservoirs were constructed and 20 deep tube-

wells were installed to extract sweet water for human and livestock use. Two desalinization plants were also installed.

- Another project entitled “Mitigation of desertification for poverty alleviation (MDPA)” has been completed for stabilizing moving sand dunes through forestry practices.
- Successful models and practices in Cholistan are being replicated in Thar deser of Sindh and Kharan desert of Balochistan under two different projects named “Combating drought and desertification in Thar desert by management of water resources” and “Rainwater harvesting and desertification control in Kharan-Chagai desert of Balochistan”.

The future plan of PCRWR among other activities include establishment of “Desertification Control Research Institute”, primarily to expand its desertification control programme in collaboration with international partners and funding mechanisms.

12.5 Ministry of Water & Power

Ministry of W&P had implemented a long-term programme “Salinity Control and Reclamation Projects (SCARP)” since 1950’s with the objectives of improving drainage and controlling soil salinity through on-farm water management. The programme has successfully completed in irrigated belts of Pakistan. Presently, WAPDA is focusing on developing large water storages on the main rivers in the wake of extended droughts and diminishing water supplies.

12.5.1 International Waterlogging & Salinity Research Institute (IWASRI)

International Waterlogging and Salinity Research Institute (IWASRI) is an institute under Ministry of Water & Power-WAPDA. IWASRI was given the charter and lead role to manage, conduct and coordinate the research pertaining to waterlogging and salinity at the country level. IWASRI has implemented various research programmes with respect to sustainable land and water management. To capitalize the research benefits, IWASRI persistently endeavors to disseminate the research results to the policy makers, planners, executors, researchers and end-user farmers through printing of technical reports, papers, newsletters and organizing seminars, workshops, farmer’s days and community training programmes. IWASRI has tangible contribution for research related to the problem of waterlogging and salinity in the country. The institute has considerably reduced the financial liabilities of GOP on various development projects through cost effective interventions relating to sustainable land and water management, drainage, lining materials and seepage losses etc. IWASRI has introduced modern technologies such as GIS/RS, EM-38, database management and groundwater modeling in research on land & water. IWASRI has two field research stations (i) Mona Reclamation Experimental Project Bhalwal, Distt. Sargodha; representing agro-climatic conditions of upper Indus Basin and (ii) Lower Indus Water Management and Reclamation Research Project (LIM) representing the agricultural environment of lower Indus Basin. They are also providing solutions to local problems in their climatic regions. IWASRI has recently completed a mega project on ‘Rehabilitation of saline and waterlogged lands’ with the assistance of AusAID and UNDP. The key specific achievements of the project include;

- Rehabilitation of 17222 acres of saline & waterlogged land with farmers’ participation.

- Established 51 fish farms.
- Established 49 Salt Land User Groups (SLUGs) with 2000 members.
- Established 49 Women Interest Groups (WIGs) with 1910 members.
- Community led saving schemes with total saving of Rs. 2..000 million.
- 53 tubewells were installed on cost sharing basis.
- More then 2.24 million salt tolerance trees were produced in the project nurseries.
- 3 mega & 231 village demo plots were established to promote bio-saline technologies.
- 10 agricultural implement pools were established for use of farming community.
- Dissemination of on-farm technologies includes a large number of exposure visits, monthly meetings, trainings, farmers' field days, workshops and pamphlets etc.
- Assistance to establish 364 nurseries. Each nursery grower earned more than Rs. 20000 per nursery.
- Completed 10 research studies.
- Established 1222 kitchen gardens as income generation activity
- 1110 smokeless stoves for WIGs members.
- Achieved 50% increase in women entrepreneurs.
- Achieved 50% increase in income per household in target groups.
- All WIG members involved in nursery raising, embroidery, tailoring, literacy and saving programs.
- 41 out of 49 WIGs operating their own community led saving programs, saved more than Rs. 0.745 million and provided loan of Rs. 0.553 million.
- The project has generated streams of income of some US\$ 3.0 million and asset appreciation of some US\$ 27.0 million and achieved cost benefit ratio of 1:9.

IWASRI has published (till June 2006) 215 research/technical reports, 433 internal reports and 391 technical research papers. The research findings have been widely circulated to the policy, planning and R&D institutions.

12.6 Achievements of Provincial NAP Implementing Institutions

12.6.1 Directorate of Soil Conservation, Rawalpindi, Punjab

The Directorate of Soil Conservation of Punjab Agriculture Department is engaged to control the problem of soil erosion for the last four decades and has the jurisdiction in the rain fed areas of Punjab extending from the Districts of Narowal to Districts of D.G.Khan and Rajanpur. The major functions of the Soil Conservation Directorate are as under:-

- To contain soil erosion process in the cultivable areas and the adjoining un-cultivated lands and to save these areas from further degradation.
- To make maximum use of run off water by conserving it into the field by various moisture conservation measures.
- To bring more area under cultivation through reclamation and gully control techniques.
- Exploitation of water resources through various means of providing assured water supply for irrigation purposes. (Mini Dams and Ponds).

Physical achievement (Post-NAP) under the normal programme is tabulated as under:-

Item of Work	Achievements
Runoff regulation by outlet structures	115951 acres
Area developed / leveled	684993 acres
Range improvement/afforestation	37147 acres
Area reclaimed through gully plugging	70692 acres
Stream bank training through plantation	3167 Km
Area protected through retaining walls	19417 acres
Mini Dams constructed	694 No.
Area stabilized through afforestation	47117 acres
Dug Wells	755 No.

Directorate of Soil Conservation has implemented following projects:

- Soil conservation in Mini Dams on Sub-Catchment Basis
- 1st Barani Area Development Project
- 2nd Barani Area Development Project (Soil and Water Conservation Component)
- Water Resource Development in Barani Area of Punjab through construction of Mini Dams/Ponds on Sub-Catchment Basis
- Micro Water Resources Development for Barani Area Specifically in Dera Ghazi Khan / Thal areas
- Drought Emergency Recovery Assistance (DERA)

The ongoing development projects are as under:-

- Barani Village Development Project (BVDP) (Soil and Water Conservation Component)
- Establishment of Water recharge System through construction of Mini Dams in Valley Soon Sakesar and Mohar Area of District Khushab
- The quantum of work under the future projects is given below:-
- Control of Hill Torrents in Dera Ghazi Khan
- Harnessing of Hill Torrents in Essa Khel of District Mianwali
- Land and Water Resources Development Projects for Soon Sakessar Valley and Mohar Area
- Control of Pollution in Rawal Lake through Soil and Water Conservation Measures (1st Phase)
- Sand Dune Stabilization in Bhakkar District
- Establishment of Soil and Water conservation Engineering Academy/Institute for imparting Training of the Staff and the Farmers
- Exploitation of water Resources for the Rehabilitation of Eco System in Salt Range Area of Punjab
- Barani Area Development through Soil and Water Conservation Activities in District Gujrat

- Rehabilitation of Agricultural Land through stabilization measures for Land Slides in Murree Area
- Development of Command Area of Small Dams/Mini Dams in Pothowar Region
- Rehabilitation of Degraded Land in Barani Areas of Punjab

12.6.2 Agency for Barani Areas Development (ABAD), Punjab

ABAD was established on the recommendation of Barani Commission in 1978. Since its creation, ABAD has implemented many long-term multi-sectoral projects aimed at improving social and economic conditions through building up the land, water, forestry, agricultural, livestock resources and promoting agro-based cottage industry in Barani (rainfed) tract of Punjab. ABAD's core staff is very limited and most of its programmes and projects are implemented in close and functional partnership with line agencies including Agriculture Department, Forest Department, Livestock Department, Poultry Department, Soil Conservation Department. ABAD is an excellent example of institutional partnership on sustainable land management and combating land degradation.

ABAD has successfully implemented two phases of ADB-sponsored project "Barani Areas Development Project". The 1st and 2nd phases of BADP has developed good community based models for sustainable NRM and land management which are being replicated in other projects. ABAD has chiefly worked with the leading national and local NGOs such as NRSP in implementing its projects. Presently, ABAD is implementing Barani Village Development Project (BVDP) with the ADB and IFAD assistance.

12.6.3 Sindh Arid Zone Development Authority (SAZDA)

SAZDA carried out studies for construction of small dams in Kohistan and Thar regions of Sindh province. Kohistan comprises of arid sub-mountainous areas where Thar region is mainly desert along the Indo-Pakistan border. SAZDA introduced new technologies of rain water storage, ground water recharge & pumping, efficient irrigation systems, dry afforestation and dryland agriculture. Most of the programme areas of SAZDA are in line with the objectives of NAP. However, the activities of SAZDA could not be aligned and streamlined with NAP process, be mainly because SAZDA became defunct in 2003.

12.6.4 Provincial Forest Departments and Irrigation Departments

Provincial Forest Departments are promoting forestry practices in drylands and deserts of Pakistan. Management of Mangrove forests is an important NAP programme area which taken up by Sindh Forest Department under different development projects sponsored by Sindh government and federal government. Sindh Forest Department is also implementing a 3-year project on "Combating desertification in Riverine forests of Sindh".

Range Management wings of provincial forest departments are specifically implementing NAP programme areas on sustainable range management in drylands and deserts. Major activities undertaken routinely by Range Management wings of provincial forest departments include excavation of water ponds (tobas) and wells, water harvesting, reseeding of forage species, dry afforestation, sand dune stabilization through vegetative measures and promotion of rotational grazing.

In Sindh, Kohistan Range Management Division headquartered at Karachi cover sub-mountainous dry and arid areas including districts of Dadu, Thatta, Jamshoro etc. While Regastan Range Management Division headquartered at Mirpur Khas exclusively deals with Thar desert falling in districts of Mirpur Khas, Mithi, and Umar Kot. Presently, two RM projects are under implementation viz: Increasing Rangelands (Barani) Productivity through Range Improvements and Mitigate Poverty” and “Range Management and Forage Production in Regastan & Kohistan Tracts”.

In Punjab, Range Manage Circle is comprised of three divisions headquartered at Chakwal, Dera Ghazi Khan and Cholistan (Bahawalpur). Chakwal RM Division is implementing “Participatory RM in Pothowar Tract of Punjab” with the sponsorship of Ministry of Environment. In Cholistan RM Division, a 3-year project “Revamping Rangelands with participation of stakeholders” has been started in 2005.

Provincial Irrigation Departments are implementing a 5-year programme “National Programme for Improvement of Watercourses in Pakistan (2004-2008)” aimed at reducing water losses and improving water use efficiency at farmgate.

12.6.5 Universities & Provincial R&D Institutions

Cholistan Institute of Desert Studies (CHIDS) is established in Islamia University Bahawalpur and conducting basic and applied research on biological, hydrological, land use and socio-economic indicators of Cholistan Desert. The findings of CHIDS are being adopted by planning and management institutions and industries. CHIDS has been identified as one of the key partners in implementing NAP.

In the post-NAP era, Shah Abdul Latif University, Khairpur, Sindh has completed the following research project on desert areas

- Floristic Study of Nara Desert (Arid Zone) Sindh
- Survey “Post-rainfall Plant Biodiversity of Nara Desert”

Future programmes and plans of the University encompass impact assessment of Rainee Canal Project on biodiversity of Nara Wildlife sanctuary in terms of transformation / loss of habitat.

University of Arid Agriculture, Rawalpindi (established in 1984 as Barani Agricultural College), has been specializing manpower in land, water and agriculture management in Barani areas of Pakistan. Soil Conservation, Agronomy and Range Management & Forestry Departments of UAAR are undertaking a number of research projects on various programme areas of NAP and fast integrating their activities with the NAP framework. A project titled “Seasonal biomass productivity and nutritional quality of major range forage species in subtropical, sub-humid area of District Chakwal” has been completed in the recent year by University of Arid Agriculture, Rawalpindi.

In Punjab, following two research institutes are contributing in sustainable land management through in-situ and ex-situ research:

- Soil Salinity Research Institute (SSRI) Pindi Bhattian
- Soil And Water Conservation Research Institute (SAWCRI), Lahore

13. Non-Governmental Organizations

13.1 National Rural Support Programme (NRSP)

NRSP is an autonomous not-for-profit organization with an objective to foster a countrywide network of grass root level organizations to enable rural men and women to plan, implement, and manage activities and programmes of social, economic and natural resources sectors. NRSP Environment and Natural Resources Management (ENRM) Programme works to create more productive integrated and sustainable land and water management systems. The objectives are to develop and strengthen local capabilities for sustainable NRM by preventing losses of NRs enhancing productivity and rehabilitating environment. Present activities include:-

- ENRM training & development of technical material
- Credit for Agriculture & Livestock
- Seed Multiplication
- Fruit Plantation Saplings in Remote Areas
- Tree Plantations
- Improvement of Water Courses
- Solar Electrification

During 2004-05, NRSP trained 7780 co-members mainly in dryland and desert areas in the fields of agriculture, forest, livestock, poultry and renewable energy. NRSP as an implementing partner in Government's "National Programme for improvement of Watercourses in Pakistan", has completed 684 schemes in canal irrigated areas and 700 in rainfed areas. Under Pakistan poverty Alleviation Fund, during 2004-05, NRSP has completed more than 200 schemes of karez, lift irrigation, lining of water channels and water harvesting structures. NRSP is the focal point for UNCCD's Thematic Programme Network – 6 (TPN-6) under which different grass-root level policy studies are currently underway.

13.2 Society for Conservation and Protection of Environment (SCOPE)

SCOPE is a pioneer NGO working to promote UNCCD in Pakistan since 1994. It has organized many international and national meetings on UNCCD implementation. SCOPE is currently implementing a number of prospects in the arid areas of Sindh which include pastoral livelihood and support, rain water harvesting, women capacity development, biodiversity support and water purification. SCOPE has established an Anti-desertification Center of Mithi and Tharparker.

14. Strategies and Priorities established within the Framework of Sustainable Development Plans and Policies

Since the submission of the Second National Report in April 2002, the Government of Pakistan (GoP) has developed a number of policies, strategies, and developmental plans aimed at promoting sustainable development and integration of the arid, semi-arid and sub-humid areas of the country into the national development frameworks. The main challenges facing the country are to reduce poverty and sustain economic growth achieved during the last five years, continuation of investment in human resources development and protection of natural resources and environment. Therefore, since 2002 the Government of Pakistan has made considerable efforts to adopt strategies and plans that address the issues of poverty reduction and economic

growth. The prominent ones include development of Medium Term Development Framework (MTDF) 2005-10, adoption of Poverty Reduction Strategy Paper (PRSP) in 2003, adoption of a National Environmental Policy in 2005 and development of the Millennium Development Goals (MDGs) in 2005. All these policies and programmes have considered conservation and sustainable use of natural resources as a vehicle to ensure sustainable development and place environmental and natural resources issues high in the national development agenda.

Despite adoption of various policies and plans, there have been limited achievements to fulfill the objectives of sustainable development due to several factors, including poor of coordination among the line agencies, limited institutional capacity, information gaps, lack of awareness and lack of funds as well as sustainability in financial resources to implement the policies and plans.

This chapter provides an overview of various national policies, strategies, and developmental plans being executed within the framework of sustainable development and the extent to which they incorporate the objectives and measures described under the National Action Programme (NAP) to Combat Desertification and Mitigate Impacts of Drought.

14.1 National Strategies and Plans available in related sectors/areas

The Government has adopted a number of sectoral and cross-sectoral policies and plans during this reporting period (since 2002) that incorporate directly and indirectly the desertification control measures identified in the NAP and contribute to over-all sustainable development of the country. How these policies and plans are relevant to implementation of Pakistan's NAP and combating desertification in Pakistan is briefly described below:

14.2 National Conservation Strategy

The National Conservation Strategy (NCS), adopted by the GoP in 1992, was the main policy document on the environment. The NCS served as a catalyst for the development of new plans, legislations and creating awareness on the major environmental challenges faced the country. Out of 14 core programme areas for priority implementation of the NCS, 7 have direct relevance to management of land resources. These include, maintaining soils in cropland, increasing irrigation efficiency, protecting watersheds, supporting forestry and plantation, restoring rangelands and improving livestock, protecting water bodies and sustaining fisheries, and conserving biodiversity.

The independent Mid-Term Review (MTR) of the NCS conducted in year 2000 concluded that achievements under the NCS were primarily awareness raising, institutional building, and strengthening of civil society organizations and their influence on the Government's environmental agenda. In terms of investment, the MTR indicated that a total of Rs.77 billion (US\$1.29 billion) were invested for protection and rehabilitation of environment in 9 years against Rs.150 billion (US\$2.5 billion) envisaged over a period of 10 years in the NCS. The short-fall in allocation and utilization of funds was attributed to the lack of capacity to formulate and implement projects in the priority areas identified in the NCS.

14.3 Provincial and District Conservation Strategies

Pakistan has prepared Provincial Conservation Strategies for the provinces of Sindh, NWFP, Balochistan and Northern Areas. These strategies highlight issues of desertification and deforestation and propose measures for sustainable management of land resources including sustainable management of water resources, controlling deforestation and combating

desertification. The province of Punjab is also considering preparation of its own conservation strategy. Some districts have also devised their conservation strategies or have started a process of having such strategies to address local level environmental and sustainable development issues. These districts include: Abbotabad, Chitral, Dera Ismail Khan in NWFP, Kalat in Balochistan and district Badin in Sindh Province.

14.4 Forestry Sector Master Plan

Pakistan has also adopted its first 25-year (1993-2018) Forestry Sector Master Plan (FSMP) in 1992. The plan addresses policy issues and highlights needs for sustainable land management, controlling land degradation, protecting environmental values and alleviating poverty from rural areas. FSMP provides strategies for conserving soil and water resources, protecting watersheds, improving rangelands, and involving local communities in natural resources management. It also outlines a program for sand dune stabilization and strengthening research in these areas. It also identifies the social, economic, and physical causes of depletion of forest resources in the country and focuses on key areas, including soil conservation, watershed management, sustainable forest management, ecosystem and biodiversity conservation and building capacities of federal and provincial forestry institutions.

FSMP also provides framework for the government agencies, NGOs, donors, private sector and local communities for making investments for the sustainable management of forest resources of the country. Since adoption of FSMP in 1992, a number of forestry programmes and projects both with local and donor funding have been executed. Most of these projects follow integrated and holistic approaches for the sustainable management of forests with the involvement of local communities.

14.5 National Environment Policy

Pakistan has adopted its first ever national environment policy in July 2005 titled "National Environment Policy 2005". The policy aims "to protect, conserve and restore Pakistan's environment in order to improve the quality of life of people of Pakistan through sustainable development". The main objectives of the policy are: 1) conservation, restoration, and efficient management of natural resources, 2) integration of environmental considerations in policy making and planning processes, 3) capacity building of government agencies and other stakeholders, 4) meeting international obligations effectively, and 5) creation of a demand for environment protection through mass awareness and community mobilization.

Many of the policy guidelines are in line with the Pakistan-NAP as well as requirements under the different articles of the UNCCD. For example, the policy calls for "development of strategies and programs to tackle desertification in line with the NAP and to establish a National Desertification Control Fund" (GoP 2005). This policy was thoroughly discussed and debated among all the relevant ministries and their commitments were solidified. In this respect the Government of Pakistan is totally committed to the implementation and mainstreaming of the NAP into national development policies and frameworks.

14.6 Agricultural Policy

The Agricultural Perspective and Policy, 2004 prepared by the Ministry of Food, Agriculture and Livestock provides for the management of degraded lands and strategies for the control of

salinity and sodicity, water-logging, control of water erosion in the mountainous areas, foothills and river plains. The policy also lays down strategies for the control of wind erosion in Thal, Thar, Cholistan and Kharan desert areas in Pakistan through effective control of grazing, sand dune stabilization, Check dam construction, growing shelter hedges around cultivated fields and use of new technologies to control soil erosion.

14.7 Biodiversity Action Plan

Pakistan signed the Convention on Biological Diversity (CBD) in 1992 and ratified it in 1994. To meet obligation under Article 6 of the CBD, Pakistan has developed and adopted a Biodiversity Action Plan for Pakistan in 2000.

14.8 National Forest Policy

Recently, Pakistan has revised its National Forest Policy (NFP) which is under consideration of the Federal Cabinet for adoption. The policy highlights the need to conserve and develop Renewable Natural Resources (RNR), including forests, watersheds, rangelands, wildlife, and its habitat. It seeks to launch a process of eliminating the fundamental causes of depletion of RNR through active participation of concerned agencies and stakeholders to realize sustainable development of the land resources. The NFP is an umbrella policy which provides guidelines to the provinces and districts to start their own policy process.

The overall goal of the NFP is “to foster sustainable development of Renewable Natural Resources of Pakistan for the maintenance and rehabilitation of its environment and the enhancement of sustainable livelihoods of rural masses, especially women, children and other deprived groups. This goal is inspired by the following key elements of the policy:

1. Reducing the impact of socio-economic causes
2. Reducing political interference in the Forestry & Wildlife Departments
3. Renovating and invigorating the institutions of RNR
4. Supporting local governments in the sustainable development of their RNR
5. Preparing and implementing policies for fragile Eco-systems

14.9 Provincial Forest Policies

The provinces of Punjab and NWFP have started the process of developing their own Provincial Forest Policies based on the guidelines provided in the National Forest Policy. It is expected that the district governments will also follow the suit and develop district level forest management policies contributing to local level sustainable development programmes.

14.10 National Environmental Action Plan

In 2001 the Government adopted the National Environmental Action Plan (NEAP) with a focus on clean air, clean water, solid waste management, and ecosystem management. In fact the NEAP was the outcome of the Mid-Term Review of the implementation of the NCS. To address the poverty-environment nexus, a NEAP-Support Programme (NEAP-SP) has been launched, which proposes a wide range of technical, institutional, regulatory, social and economic

interventions grouped under the following sub-programs: (i) policy coordination and environment governance; (ii) pollution control; (iii) ecosystem management and natural resources conservation; (iv) energy conservation and renewable energy; (v) dry-land management; and (vi) grassroots initiatives.

Three of NEAP's sub-programmes, namely Ecosystem Management and Natural Resources Conservation, Dryland Management and Grassroots initiatives directly deals with the land management issues and incorporate desertification control measures in their work programmes. The GEF Council has recently approved the first phase of Pakistan's Sustainable Land Management Project, which was in fact initiated under the Ecosystem Management Sub-Programme of the NEAP-SP.

14.11 Poverty Reduction Strategy Paper

Pakistan adopted its first "Poverty Reduction Strategy Paper (PRSP)" in 2001. It also emphasizes the need to address issues of land degradation, soil erosion, desertification, and excessive use of pesticides and to minimize impact of these on local livelihoods and the environment. The strategies relevant to land management include: improving access of the poor to cultivable lands, reclamation of waterlogged and saline lands, and providing opportunities to the rural poor for sustainable management of natural resources such as forests, rangelands and water.

The provinces have also initiated the preparation of PRSPs, to identify priority steps for providing alternative economic opportunities for the rural poor focusing on agriculture, livestock and rangeland development. The PRSP for Balochistan suggests a number of measures for sustainable management of land resources, including increasing the cultivated area through better water management, construction of small dams for harvesting rain water, reclamation of waterlogged and saline areas, improvement in the marketing system of agricultural products, rangelands rehabilitation, increased water use efficiency, undertaking groundwater recharge measures, eliminating electricity subsidies to check over-exploitation of groundwater and credit facilities for small farmers for promoting sustainable agriculture practices. Recently, the federal Government has initiated consultations for the preparation of PRSP-II. It is expected that the PRSP-II will have more robust recommendations and targets for taking desertification control measures and linking sustainable land management with poverty reduction efforts of the Government.

14.12 Medium Term Development Framework 2005-10

In 2004, Pakistan also adopted a "Medium Term Development Framework-2005-10" (MTDF-2005-10), which was developed through a consultative process involving all the federal ministries, provincial governments and civil society organizations. The implementation of the MTDF constitutes the government's next five year's development agenda. Importantly, for the first time, "desertification control" has been considered a priority area. A number of programmes and projects have been identified in the framework, which both directly and indirectly contribute to implementation of the NAP and UNCCD. The document calls for promoting sustainable land management interventions and developing programs and strategies to tackle desertification problems in the country. The MTDF allocates US\$ 4.94 million for combating desertification in the country, including for sustainable land management interventions and the creation of a National Desertification Control Fund during the next five years.

14.13 Pakistan's Millennium Development Goals Report

Pakistan is committed to change its economic and social landscape to fulfill its pledge to the Millennium Declaration and to attain the Millennium Development Goals (MDGs). Pakistan MDGs Report for 2005 was prepared through a participatory process with the involvement of federal and provincial governments, civil society organizations, private sector and the developmental partners. Based on the country's specific conditions, priorities, data availability and capacity, Pakistan has adopted 16 targets and 37 indicators of the 8 goals as compared to 18 targets and 48 indicators designed by the UN System. For example to eradicate extreme poverty and hunger, Pakistan intends to halve the proportion of people whose income is less than a dollar a day by the year 2015. To ensure environmental sustainability in the country, Pakistan is committed to "integrate the principles of sustainable development into country's policies and programmes and reverse the loss of environmental resources by increasing tree-cover, bringing more areas under the protected landscape and enhancing energy use efficiency. The report also elaborate on the challenges and constraints faced Pakistan for controlling environmental degradation under the scenario of high population growth, rapid urbanization and unsustainable land management practices.

14.14 National Land Use Planning Programme

The Ministry of Environment is implementing a national landuse planning programme, which envisages generation of digital land use maps for the country in order to adopt integrated approach for planning and management of land resources. It is expected that this programme will help in promoting integrated and cross-sectoral approach for the management of natural resources including curtailing deforestation, combating desertification, mitigating impact of drought, promoting sustainable agriculture and integrated rural development, conservation of biological diversity and maintaining the supply and quality of freshwater resources. The landuse planning programme will take into account human settlements, industrial locations, and urban infrastructure. The anticipated outcome of the programme will be sustainable national development polices for maintaining the current level of economic growth.

14.15 National Communication for the UNFCCC

Pakistan was also one of the first signatories to the United Nations Framework Convention on Climate Change (UNFCCC), which was signed in 1992 and ratified in 1994. To implement the convention, Pakistan has completed a number of major studies and projects focusing on climate change and GHG reduction. Recently, Pakistan prepared the First National Communication for the UNFCCC, which also gives high priority to sustainable management of land resources, particularly, forests, watersheds and rangelands to mitigate the impact of green-house gases and to enhance carbon sequestration capacity by enhancing green biomass in the country.

15. International Partners for Cooperation on UNCCD

The Regional Action Programme (RAP) for Asia emanated from two 'Regional Conferences on The Implementation of the United Nations Convention to Combat Desertification and Drought in Asia' (New Delhi, 1996 and Beijing 1997) followed by a Ministerial Conference (June 2003 in Abu Dhabi). These events defined the Asia RAP framework for cooperation, urged the NAP process forward, and approved six Thematic Programme Networks for the region. Annual meetings of national focal points have been organized since 1996 to advance the RAP process.

The SA-SRAP established two Programme Areas: Early warning systems for land degradation and drought; and integrated ecosystem management with emphasis on sustainable pastoral silvo-agriculture. Cross-cutting activities include an information network, capacity-building and resource mobilization/ partnership building.

Within these regional and sub-regional frameworks, India and Pakistan are involved in six Thematic Programme Networks (TPNs). TPN1 on 'Desertification Monitoring and Assessment' is hosted by China and involves both India and Pakistan. It focuses on enhancing desertification monitoring and assessment capacities of Asian countries. It focuses on benchmarks and indicators for desertification, applying these to develop a regional desertification map for Asia.

Rangeland Management in Arid Areas Including the Fixation of Sand Dunes' is hosted by Iran, and involves Pakistan. It seeks to re-establish sustainable and equitable rangeland management systems in member countries. Participatory approaches be engaged, and attention paid to socio-economic as well as biophysical drivers of degradation. The establishment of a network with close ties to ICARDA and other international institutes is a high priority.

The South Asian Association for Regional Cooperation (SAARC), established in 1985, convenes the Heads of State or of Government of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. It "provides a platform for the peoples of South Asia to work together in a spirit of friendship, trust and understanding" and "aims to accelerate the process of economic and social development in Member States." It has created a Technical Committee on Agriculture and Rural Development, which has been active on dryland issues.

The South Asia Co-operative Environment Programme (SACEP) is an inter-governmental organization provides a framework for ecologically-oriented regional cooperation. Member countries are the same as for SAARC, with the addition of Afghanistan. SACEP supports national efforts to fulfill multilateral environmental commitments for environmental protection and sustainable development, including the promotion of regional activities, knowledge and expertise sharing, resource mobilization, and translating action into impact.

Pakistan is a member of APAARI, the Asia-Pacific Association of Agricultural Research Institutions. APAARI's mission is to "promote the development of National Agricultural Research Systems in the Asia-Pacific region through inter-regional and inter-institutional cooperation." APAARI performs an umbrella function, uniting other regional networks, providing a forum for regional dialogue on crosscutting issues such as those affecting the dry lands, and fostering global integration of Asian agricultural research with other regions of the world.

One of the networks under the APAARI umbrella is CLAN, the Cereals and Legumes Asia Network. CLAN focuses on improving crops and cropping systems with much of its work focused on the dry areas. Pakistan is a member of CLAN , Other Asian CLAN member countries with substantial dry lands are China, India. Iran, Sri Lanka, Thailand and Vietnam.

ICRISAT has served as the coordinating hub for CLAN since its inception in 1992. CLAN has been a vehicle for frequent and productive scientific exchanges between these countries. It assists members in identifying production constraints through the sharing of knowledge and expertise, joint on-farm research, and capacity-building. Through its ICRISAT tie-in, CLAN will be an active vehicle for sharing the results of the present project with its neighbors in the region, and vice-versa.

16. Diagnosis of Past Experience

Before 2003, different institutions were implementing their respective programmes and plans without adequate reference to NAP. NAP implementation got momentum after GEF started providing a financial mechanism to implement UNCCD. Immediately afterwards, these institutions began reviewing their programmes and plans with reference to the national obligations under UNCCD and the provisions of NAP. Today, most of the programmes and projects of the following sectors specifically mention UNCCD and NAP as justification and guiding documents.

- i. Soil Conservation and Land Reclamation
- ii. Drought Mitigation and Water Use Efficiency
- iii. Dry Afforestation
- iv. Range Management
- v. Dryland Agriculture
- vi. Sand dune Stabilization
- vii. Integrated Land Management

Provincial Agriculture Department, Forest Departments, Soil Conservation Directorate, Pakistan Meteorological Department and National R&D institutions including Pakistan Council for Research in Water Resources, Pakistan Agriculture Research Council, Arid Zone Research Center, Cholistan Institute of Desert Studies are implementing various activities towards the achievements of NAPs objectives. Specific activities and achievements are given in the chapter on institutional framework. Activities in the fields of combating desertification undertaken by National and provincial institutions fall in two categories i.e. (i) activities undertaken as routine function financed from regular budget, and (ii) activities undertaken under development projects funded by either governmental or ODA sources.

As a policy matter, most of the activities by public sector institutions and NGOs are based on participatory models. For example, Irrigation Departments work through Water use Associations, Forest and Range Departments through Community-based organizations. These participatory models are reported to be very conducive to invoke local development planning and to inculcate ownership of interventions. Unfortunately, the community-based activities in the field of combating desertification were undertaken in short term projects, and most of them are not sustaining after completion of the project and stoppage of funds. A major constraint in implementing desertification control activities is the limitation of funds under regular budgets of most of the concerned organization. Development funds are available for a limited period to achieve pre-specified targets. The impacts of these investments are usually visible after completion of the projects. It is imperative that regular budgets of desertification combating institutions should be enhanced substantially to meet the financial requirements of their long-term programmes, rather than funding short term projects. In non-government sector there are some good examples of persistent funding in community-based land management and NRM activities e.g. Agha Khan Rural Support programme, operating in dry temperate northern Pakistan since 1982 and National Rural Support Programme, a home-grown NGO operating throughout the country since 1992. Although many public sector institutions are replicating AKRSP and NRSP like participatory models, yet they suffer very frequently from discontinuity, delayed releases and exhaustion of funds.

Government of Pakistan has now announced National Finance Commission award to the provinces which will certainly support regular functioning of provincial institutions rather than relying on developmental grants and sponsorship of projects by the Federal Government. The

ODA from bilateral and multilateral sources to implement NAP should also preferably support regular institutions instead of funding projects to be implemented by parallel establishment or project staff.

Chapter 6 of NAP on “Financing Action Plan to Combat Desertification” mainly focuses on prospective sources for funding for NAP-based projects/schemes. In the wake of a growing realization, on the basis of past experiences, that major financial (and technical) assistance should aim at invigorating and strengthening regular functions of relevant institution, chapter 6 needs revision, indicating the financial needs based on the comprehensive programmes, available financial sources and financial shortfall pertaining to key NAP implementing institutions

17. Some Integrated Projects

17.1 Barani Village Development Project (BVDP) 1999-2007

A major arm of the project is to introduce irrigation and technologies suitable for low rainfall areas to help increase crop fields and land productivity. BVDP is being implemented by ABAD which is a leading organization in implementing Nap and BVDP is completely streamlined with the objectives of UNCCD and NAP. A total of 235 mini dams, 161 ponds and 5513 soil conservation structures and 1492 dug wells constructed through community organizations. BVDP is a multi-sectoral integrated project with IFAD assistance of US \$ 25.1 million.

17.2 NWFP Barani Area Development Project (BADP) 2003-2009

Another integrated mega project of NWFP Government with prime aim of reducing poverty and improving living conditions of the communities of barani areas of NWFP targeting 67000 households. The project seeks to avoid frequent crop failure mainly because of low rainfall through improved irrigation and crop management technologies. The project also works to improve basic infrastructure, health and education. Total cost of BADP is US \$ 98.7 million, being financed jointly by ADB IFAD and Government of NWFP. The was designed under UNCCD obligations and works in many priority programme areas of NAP. Another mega project implemented by Agency for Barani Area Development (ABAD) namely “Sustainable Livelihood in Barani Areas Project”

17.3 Southern Federally Administrated Tribal Areas (FATA) Development Project (2002-2009)

This integrated project is working to improve living conditions and incomes for small-scale farmers of southern tribal areas of Pakistan, bordering with Afghanistan. The project is bringing irrigation and other NRM technologies in arid mountainous areas which experience frequent crop failure due to extended droughts and inadequate rainfall. The seven year project is under implementation at a cost of US \$ 21.8 million.

17.4 Dera Ghazi Khan Rural Development Project (DGK – RSP) (1999-2006)

DGK-RSP is an integrated project of Government of Punjab operating in two southern districts of Punjab viz. DG Khan and Rajanpur, at a total cost of US \$ 40 million, a major share

contributed by ADB as loan. The project works to improve the living conditions of agrarian communities of extremely arid districts with very low land productivity. The project is built on particularly model and NRM interventions in the fields of irrigation, land, crop management, soil conservation from hill torrents and water conservation are undertaken through Cos. Community Mobilization Component is chiefly implemented by NRSP.

18. Local Capacity Building

During 2001, Government of Pakistan decentralized most functions from the provinces to district Governments. Agriculture Department has been completely devolved except for its Research & Development wings. Part of Forest Department has also been devolved. However, there is growing need for training and capacity building of local level land planners and managers. Development planning is now established on the principles of community participation through mobilization and capacity building of local communities, particularly gender sensitization and empowerment of custodian of natural resources. All development programmes and projects have integral components of training and capacity building of participating communities.

19. Financial Mechanism to Implement NAP

NAP programme areas are being implemented by the concerned organizations under two different budget lines i.e. regular and development budgets. Regular functions of these organizations are performed from provincial Annual Development Programmes, whereas development projects are implemented with additional financing from Public Sector Development Programmes. Federal Government supplements provinces in implementation of NAP, particularly in those areas where environmental and land degradation magnitudes are beyond the allocated resources of the provinces. Federal Government also arranges ODAs through multilateral and bilateral negotiation to assist in financing the projects of programmes to combat desertification.

After 2003, GEF has assumed the responsibility of providing multilateral funds for implementing NAP, through its implementing agencies viz: The World Bank, UNDP and UNEP. Some non-conventional sources of funding NAP related activities are also being explored by the Government of Pakistan including Desertification Control Fund and CDM.

Country Profile

1. Physiography

Physiography of Pakistan is marked by two distinct landforms which are resultant of two major geomorphic processes.

1. Western Highlands produced by mountain building movement (Himalayan orogeny) occurring in the Tertiary era.
2. Indus Plains resulting from the deposition of sediments by the Indus River and its tributaries into shallow bays in the Quaternary era.

Western Highlands of Pakistan extend from the Makran Coast in the south to the Pamir Plateau in the north covering most of Balochistan, NWFP, the Northern Areas and part of the Punjab. The Highlands emerged from the Tethys Sea by the Himalayan orogeny which started in the Eocene and continued intermittently up to the Pliocene period. During the Cretaceous period patchy igneous activity took place. Safed Koh and Waziristan Hills in the NWFP and the Chagai Hills and the Ras Koh in Balochistan have stocks, bosses, dykes and sills to speak of the volcanic activity.

Western Highlands can be divided into the following physiographic divisions:

- Mountainous North
- Safed Koh and Waziristan Hills
- Sulaiman and Kirthar Mountains
- Balochistan Plateau
- Potwar Plateau and the Salt Ranges



Northern Mountainous belt comprises of parallel mountain ranges intervened by narrow and deep river valleys. The important mountain ranges are the following:

- The Himalayas
- Karakoram and other ranges also called the Trans-Himalayas lying north of the Himalayas
- Hindu Kush and other ranges also called the Trans-Indus lying west of the Indus River.

2. Administrative Units

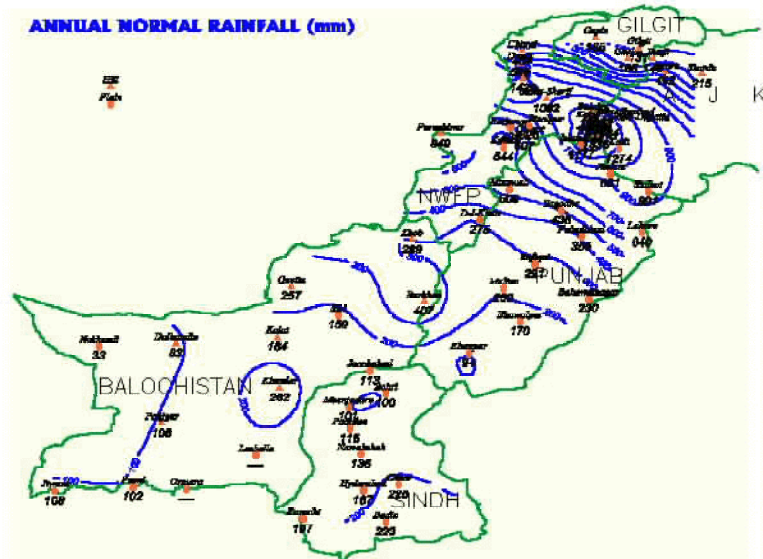
Administratively Pakistan is divided into four provinces, Balochistan, North West Frontier Province (NWFP), Punjab and Sindh. Besides these there are Federally Administered Tribal Areas, Northern Areas, AJK and Islamabad. The provinces are divided into districts which in turn are subdivided into tehsils. Under its devolution Plan 2001, Pakistan has given more autonomy to 110 Districts.

3. Climate

The factors that control climate and climatic variability in Pakistan are:

- (i) Subtropical location of Pakistan from approximately 23 to 37°N latitudes.
- (ii) Oceanic influence of the Arabian Sea keeps down the temperature contrast between summer and winter at the coasts.
- (iii) Continental effect accentuates the differences in temperature between summer and winter in the interior of the country.
- (iv) Higher altitudes in the west and north keep down the temperature throughout the year. In the extreme north because of great heights, the mountain tops record freezing temperature all the year round. The hills and mountains also attract more rain than the plains.
- (v) Monsoon winds which come in July and continue to blow up to September bring rainfall. Pakistan receives only the tail-end of the monsoons, therefore the monsoon season is neither as prolonged nor as wet as that in India.
- (vi) Western Depressions originating from the Mediterranean region and entering Pakistan from the west bring rainfall in winter.
- (vii) Thunderstorms cause same amount of rainfall particularly in the north.

Resultantly, dry and arid climate is experienced in the major part of Pakistan. Sub-humid conditions prevail over a small strip in the north. The whole of Sindh, most of Balochistan, the major part of the southern Punjab and the central part of the Northern Areas receive less than 250 mm of rainfall in a year. Three large tracts, (1) Northern Sindh and Southern Punjab, (2) North-western Balochistan and (3) Central part of the Northern Areas have to contend with an annual rainfall of less than 125 mm. North of Central Punjab the rainfall steadily increases and aridity starts to diminish. Isohytes are shown on Pakistan by PMD sources.



4. Soils

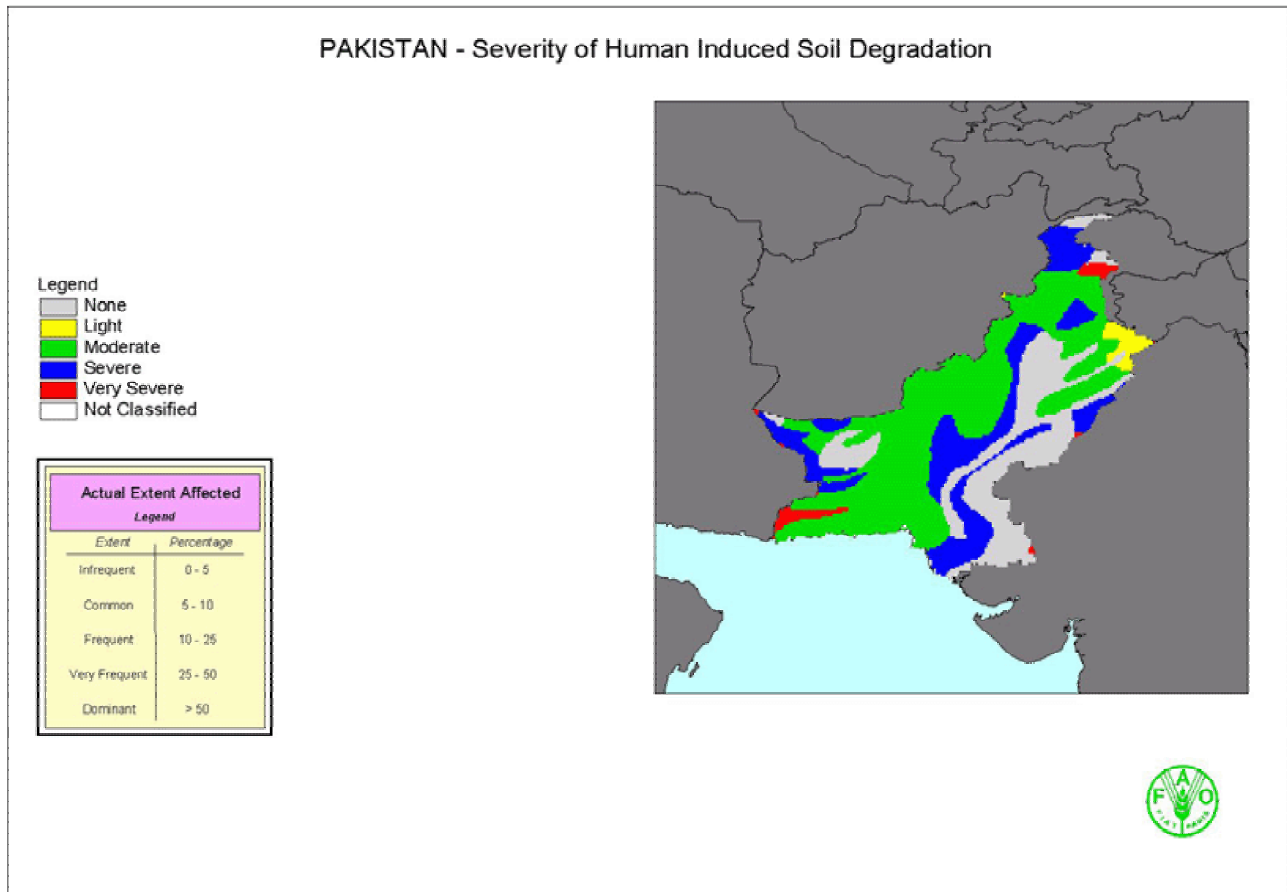
The soils of Pakistan are derived from two types of parent materials:

- Alluvium, loess and wind-reworked sands
- Residual material obtained from weathering of underlying rocks

Most of the rocks are calcareous (limestone or calcareous shale). In some localized areas like

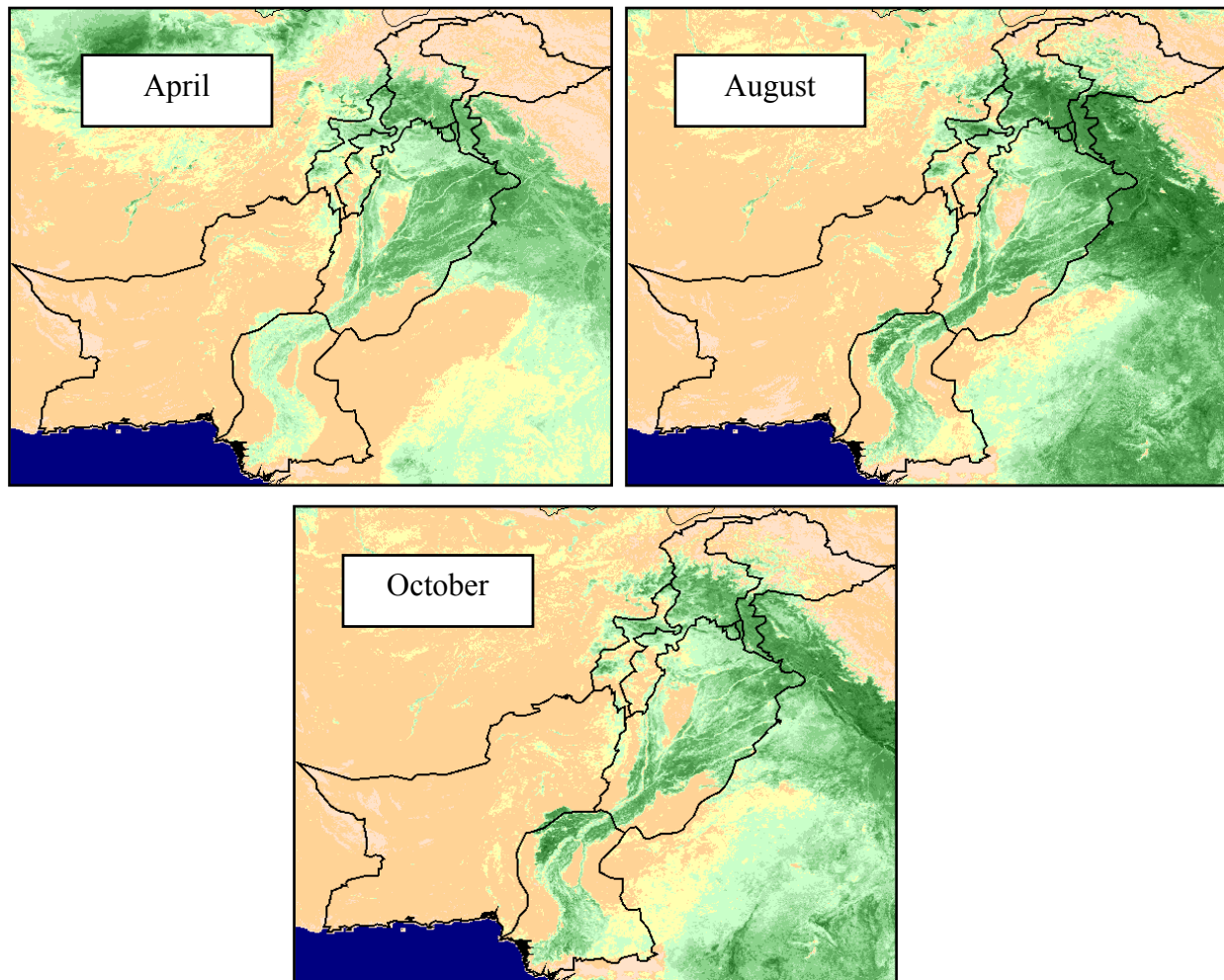
Swat volcanic rocks such as granites have produced non-calcareous soil material. Very small quantities of salts are released from most rocks and soils are therefore non-saline. Saline playa lakes which are of small areal extent are exceptions.

Aridity prevailing over the major part of Pakistan is the main climatic characteristic that affects its soils. This has resulted in paucity of soil water and scantiness of vegetation cover. Soil alkalinity and salinity have been encouraged. The soils are rich in basic but poor in nitrogenous matter. Similar conditions with slightly less intensity are experienced in the subhumid regions. Humid areas are relatively smaller in extent. In the extreme- north, there are areas with a perpetual cover of snow where development of soil has not taken place. State of soil degradation due to human activities has been shown in the following map published by FAO.



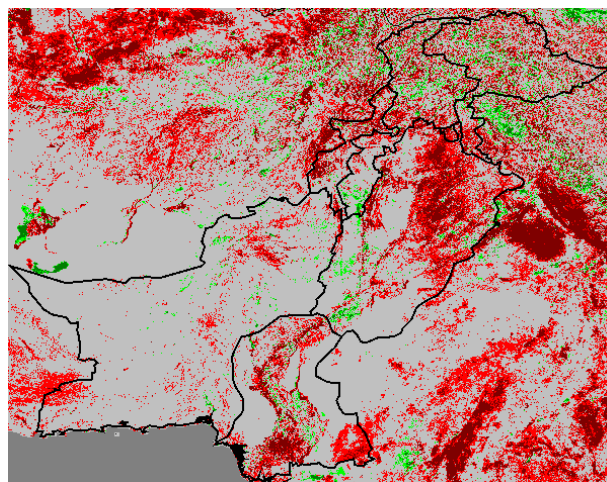
5. Natural Vegetation and Extent of Desertification

Vegetation cover over most of Pakistan is scarce. This has resulted in scantiness of organic matter in the soils. Humus formation is limited and pH in general is high. The vegetation cover and indirectly productivity of lands are manifested by Normalized Difference Vegetation Index. PMD publishes high resolution NDVI maps of Pakistan derived from SPOT VGT for general use by a large number of stakeholders. Mean monthly NDVI of Spring (April) and Autumn (October) and its interpretation as vegetation cover are given in the following figures:



Deep green areas represent highly dense vegetation that exists in irrigated Indus Basin and sub-Himalayan northern tracts. Light green color shows sparse vegetation whereas yellow and brownish colors represent areas devoid of vegetation cover. It is evident that most parts of Balochistan, southern parts of Punjab (Cholistan) and eastern parts (Thar desert) of Sindh have very little vegetation cover. High NDVI in along the Indus River is the legacy of irrigation water that supports agriculture in arid and semi-arid tracts of Pakistan.

Temporal changes in NDVI can be evaluated to give the magnitude and shift in total land productivity or the extent of desertification. For example, difference in NDVI during the dry month of June for the years 1999 and 2005 has yielded this NDVI Change Map. The red areas designate reduction in NDVI or vegetation cover whereas Green areas show a positive change. It can be predicted that in June when most of the crops have been harvested and only natural vegetation is detected, there is significant change all over Pakistan between 1999 and 2005. More scientific theories and R&D is required to monitor extent of desertification from satellite data.



6. Land Use

According to Economic Survey (2002-03), agriculture is the major land use in Pakistan. Of the surveyed areas in four provinces (excluding AJK), cultivable area is 31.28 m ha (or 39.3% of total land area). Of which only 22.13 m ha area is under cultivation and remaining 9.15 million ha is being used as very low production rangelands. An area of only 3.81 m ha (4.8% of total land area) is under forest cover.

Land-use category	Area	
	(m ha)	(%)
Cultivation	22.13	27.8
Culturable waste	9.15	11.5
Not available for cultivation	24.36	30.6
Forests	3.81	4.8
Unclassified area	20.16	25.3
Total	79.61	100

Source: Economic Survey 2005-06

Details of forest cover, as assessed from satellite remote sensing data in 2003-04 is given in following table. This statistics does to include trees on farmlands and isolated patches of natural forests which can not be detected from space. **Including All forest types, 5.01% of the total country's land area is under forest cover.**

Province	Land area (m ha)	Forest area	
		Area (m ha)	% of total
NWFP	10.17	1.49	14.65
Punjab	20.63	0.44	2.13
Sindh	14.09	0.28	1.99
Balochistan	34.72	0.45	1.30
Northern Area	7.04	0.32	4.55
AJK	1.33	0.34	25.56
Total	87.98	3.32	3.77

Source: National Forests and Range Resources Assessment Survey (2003-04) conducted by Pakistan Forest Institute, Peshawar & Ministry of Environment

Details of Rangelands, as assessed from satellite remote sensing data in 2003-04 is given in following table:

Province	Land area (m ha)	Range Area	
		Area (m ha)	% of total
NWFP	10.17	4.73	46.51
Punjab	20.63	5.19	25.16
Sindh	14.09	2.66	18.88
Balochistan	34.72	8.95	25.78
Northern Area	7.04	1.15	16.34
AJK	1.33	0.87	65.4
Total	87.98	23.55	26.77

Source: National Forests and Range Resources Assessment Survey (2003-04) conducted by Pakistan Forest Institute, Peshawar & Ministry of Environment

7. Desertification Related Problems

Desertification process resulting from degradation of lands is threatening most of the area of Pakistan. Underlying factors inducing desertification include a mix of natural and anthropogenic causes. Main threats that are leading to further degradation of productive lands include:

- Climate change, rising temperatures, extended droughts
- Diminishing supplies of fresh water resources for irrigation
- Water erosion, Landsliding and earthquakes in dry uplands
- Wind erosion, moving sand dunes in deserts
- Deforestation and loss of biodiversity
- Mismanagement of Arable Lands
- Mismanagement of Irrigation Water, Waterlogging and Salinity
- Overuse of Grazing Lands

Global warming is accelerating glacial melting in extreme north of Pakistan threatening freshwater resources that are predicted to shrink by 27% by 2050 (IPCC TAR 2001). Extended droughts and evaporation losses are fast diminishing irrigation water supplies. While uplands are frequently receiving short-lived torrential rains, fragile slopes are experiencing failures and severe water erosion. Ministry of Environment has estimated from SRS interpretation that after 1992 natural forest cover has been declining at an average rate of 27,000 hectares per year. Whereas, tree cover on farmlands has increased substantially from 480,000 to 760,000 hectares during the same period.

Chemical fertilizers are now regarded as essential inputs for agricultural crop production. Economic Survey of Pakistan 2006 has estimated that off-take of fertilizers in Pakistan has increased significantly i.e. from 2.929 to 3.694 million tons from 2001 to 2005. However, injudicious applications of chemical fertilizers have led to degradation of lands in the form of salinity and sodicity.

**LIST OF THE MEMBERS OF THE NATIONAL COORDINATION
COMMITTEE TO COMBAT DESERTIFICATION (NCCD)**

Secretary (Chairman) M/o. Environment Government of Pakistan, Islamabad	Representative, Pakistan Council for Research in Water Resources Islamabad.
Inspector General Forests, M/o. Environment Government of Pakistan, Islamabad	Representative, WAPDA
Director General (Environment) M/o. Environment Government of Pakistan, Islamabad	Director General, Soil Survey of Pakistan, Lahore
Representative of M/o. Food, Agriculture and Livestock Government of Pakistan, Islamabad	Representative, University of Arid Agriculture, Rawalpindi
Chief (Environment) Planning & Development Division, Government of Pakistan, Islamabad	Representative, University of Balochistan, Quetta
The Secretary, Department of Agriculture Punjab, Lahore	Director General, Cholistan Development Authority, Bahawalpur.
The Secretary, Department of Agriculture Sindh, Karachi	Director General, Sindh Arid Zone Development Authority, Hyderabad.
The Secretary, Department of Agriculture NWFP, Peshawar	Representative, Society for Conservation and Protection of Environment (SCOPE) Karachi.
The Secretary, Department of Agriculture Balochistan, Quetta	Representative, Agha Khan Rural Support Programme (AKRSP) Gilgit
The Secretary, Department of Agriculture Azad Kashmir, Muzafferabad	Representative, National Rural Support Programme Islamabad.
The Secretary, Department of Agriculture and Forests, Northern Areas, Gilgit.	Representative, Sarhad Rural Support Corporation (SRSC) Peshawar
Representative, Pakistan Agricultural Research Council, Islamabad	Representative, Balochistan Rural Support Programme Quetta.
	Representative of NGO Coordination Committee

Annex-II

Contributors in Preparation and Validation of 3rd Assessment Report

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5.	Mr. Rizwan Irshad, Technical Officer (Biodiversity)	
6.	Mr. Asif Hanif, Deputy Project Manager, MEA Cell	
7.	Mr. Ahmed Hussain, Deputy Project Manager, MEA Cell	
8.	Dr. Razaul Haq, Director General	Pakistan Forest Institute, Peshawar
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11.	Dr. Raza Bhatti, Director Herbarium	Shah Abdul Latif University, Khairpur
12.	Mr. Mushtaq Ahmed, Director General	Arid Zone Research Centre, Quetta
13.	Mr. Imtiaz Ahmed, GIS Specialist	International Waterlogging & Salinity Research Institute, Lahore
14.	Mr. Sajid Hussain Awan, Assistant Chief	Agency for Barani Areas Development (ABAD)
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18.	Mr. Irfan Ashraf, Lecturer	Department of Forestry, University of Arid Agriculture Rawalpindi.
19.	Mr. Wahid Ali, Visiting Teacher	Farm Mechanization, Rawalpindi.
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22.	Mr. Faiz Ali Khan, Technical Specialist	IUCN, Islamabad.
23.	Dr. Muhammad T. Afzal, Foreign Professor	University of Fredericton, Canada (Visiting University of Arid Agriculture)
24.	Dr. Irshad Ahmad Khan, Associate Professor	University of Arid Agriculture, Department of Range Management Forestry
25.	Mohammad Ziad Awan, Deputy Forest Manager	Forest Development Corporation, NWFP
26.	Mr. Asif Khan, Student (UAAR)	University of Arid Agriculture, Department of Range Management Forestry
27.	Dr. Mohammad Rafiq-ur-Rehman, Director General Agri (Field)	Punjab Agriculture Department, Lahore.
28.	Mr. Tanveer Arif, Chief Executive Officer	Society for Conservation & Protection of Environment (SCOPE), Karachi
29.	Qazi Tallat M. Siddiqui, AEA(C)	Ministry of Water & Power, Islamabad
30.	Syed Moazzam Nizami, Assistant Professor	University of Arid Agriculture, Department of Forestry
31.	Abdul Munaf Qaimkhani, Deputy Inspector General Forests-II	Ministry of Environment, GoP
32.	Hazrat Mir, Chief Metrologist	Pakistan Metrological Department, Islamabad
33.	Azmat Hayat Khan, Director (Pak Metro Department)	
34.	Dr. Muhammad Iqbal, Professor/Director Research	University of Arid Agriculture
35.	Muhammad Haibat Khan, Coordinator/M. Ikram-ul-Bari CEO	Al Bari Foundation, Islamabad
36.	Dr. Muhammad Munir, Professor and Chairman	University of Arid Agriculture, Rawalpindi