# Pakistan

# Fifth National Report

## Progress on CBD Strategic Plan 2010-2020 and Aichi Biodiversity Targets

**Climate Change Division**
**Government of Pakistan**
**March 2014**

**Cover Photo:** Rati Gali Lake, Neelum Valley, Azad Jammu and Kashmir (AJK). (Photo by Mumtaz Hasan – Contributed by Wildlife and Fisheries Department, AJK)

## LIST OF ABBREVIATIONS AND SYMBOLS

| | |
|---|---|
| AJK | Azad Jammu and Kashmir |
| BAP | Biodiversity Action Plan |
| BGN | Biodiversity Global Networking |
| BSAP | Biodiversity Strategy and Action Plan |
| BWG | Biodiversity Working Group |
| CBD | Convention on Biological Diversity |
| CCD | Climate Change Division |
| CCP | Cetacean Conservation Programme |
| CHM | Clearing House Mechanism |
| CITES | Convention on International Trade in Endangered Species of Fauna and Flora |
| CKNP | Central Karakorum National Park |
| EEZ | Exclusive Economic Zone |
| EIA | Environmental Impact Assessment |
| GEF | Global environment Facility |
| GIS | Geographical Information System |
| GoP | Government of Pakistan |
| Ha | Hectare |
| HBB | Himalayan Brown Bear |
| IUCN | International Union for Conservation of Nature |
| KP | Khyber Pakhtunkhwa |
| LMOs | Living Modified Organisms |
| M | Meters |
| MNP | Machiara National Park |
| MAP | Medicinal and Aromatic Plants |
| MCPA | Marine and Coastal Protected Areas |
| MDG | Millennium Development Goal |
| MFF | Mangroves for Future |
| MoCC | Ministry of Climate Change |
| MoE | Ministry of Environment |
| NCB | National Coordination Body |
| PA | Protected Area |
| PAMP | Protected Area Management Project |
| PEPC | Pakistan Environment Protection Council |
| PFI | Pakistan Forest Institute |
| PMNH | Pakistan Museum of Natural History |
| PNC | Pakistan National Committee |
| $REDD^{+}$ | Reducing Emissions from Deforestation and forest Degradation |
| RFP | Request for Proposal |
| Rs | Rupees |
| SEA | Strategic Environmental Assessment |
| UN | United Nations |
| US$ | United States Dollar |
| WB | World Bank |
| WHO | World Health Organization |
| WRI | World Resources Institute |
| WWF | World Wide Fund for Nature |
| % | Percent |

# Table of Contents

**List of Figures**



**List if Tables**

**List of Appendices**

## ACKNOWLEDGEMENTS

I am grateful to The Climate Change Division (CCD), Government of Pakistan and IUCN – International Union for Conservation of Nature– for reposing trust in me and other members of the team to undertake the important task of preparing the 5th National Report of Pakistan to the Convention on Biological Diversity. The team comprised me, Inam Ullah Khan (IUCN Pakistan), Naeem Ashraf Raja (CCD), and Taymoor Arif (IUCN). The task of preparing the report in a short time of four weeks was a tall order; however, good teamwork and excellent logistic support by IUCN made it happen.

Syed Mahmood Nasir, Inspector General of Forests took personal interest and provided technical guidance throughout the process and ensured that planners and policy makers at the highest level participated in the consultative process. His personal efforts are worth mentioning as he organized a meeting of the Biodiversity Working Group and other key professionals at a very short notice. Without his interest it would not have been possible to get the progress on Strategic Objectives and Aichi Biodiversity Targets 2010-2020. I am grateful to the Provincial line Departments, National Institute of Oceanography Karachi and WWF Pakistan Karachi and Lahore for their contribution and sharing their experiences with the team. The Ministry of Food Security is so much preoccupied with agricultural production that Agro biodiversity receives hardly any attention. IG Forest personally talked to the Secretary Food Security and got him so much interested in the subject that he organized a consultative meeting of all senior professionals of the Ministry on a weekly holiday to ensure their full participation and undivided attention. Last but not the least, he assigned Naeem Ashraf Raja, Director Biodiversity to work full time with the team in preparing the progress report.

My special thanks to Mahmood Akhtar Cheema, Country Representative IUCN Pakistan who personally made sure that the team got maximum professional and logistic support. Inam Ullah Khan, IUCN NRM Expert not only made substantive technical contributions to the report but also used his personal contacts to ensure participation of key professionals in the process. Ghulam Qadir Shah and Faiz Kakar arranged and facilitated stakeholder consultations in Karachi and Quetta respectively. Taymoor Arif coordinated stakeholder consultations and logistics and made contributions to convert targets of Biodiversity Action Plan and other CBD Programmes of work into a matrix form. Naeem Ashraf Raja, Director Biodiversity brought with him the institutional memory, and professional and editorial skills.

There are many other persons to be mentioned by name, who worked hard to make travel, lodging and boarding arrangements and took care of the financial matters. On behalf of the team, I thank all those who helped us with the logistics.

15 March, 2014

Ch. Javed Ahmed
Biodiversity Consultant

## FOREWORD

The preparation of fifth national report to the CBD not only provided an opportunity to review mid-term progress towards the implementation of the Strategic Plan for Biodiversity 2010-2020 and progress towards the Aichi Biodiversity Targets, but also brought to the fore the inherent institutional weakness for the implementation of the Convention on Biological diversity. Although we still have a long way to go towards achieving the objectives of the Convention and implementing the Strategic Plan, but I am happy to see that we have made good progress despite our weak institutional capacity and lack of adequate human and financial resources. I am thankful to IUCN Pakistan who helped us with writing the progress report and I greatly appreciate the process adopted for this purpose. Provincial and regional consultations and one on one meetings with stakeholders and other key professionals maximized the stakeholder participation in the process.

Unfortunately, except for the target to increase the protected areas coverage, we were unable to set national targets under the Strategic Plan and consequently reporting progress in the form of 5th National Report was not an easy task. However, I am pleased that the team writing the report worked hard to dig information and I am pleased to acknowledge that we have made fairly good progress. The credit for the progress goes to the Provinces and territories that have been instrumental in contributing to highlight and share, steps taken, which contributed to Aichi targets, for which I am grateful. This clearly shows that awareness about the biodiversity conservation and sustainable use has increased and biodiversity concerns are getting incorporated in sectoral and cross sectoral policies and plans. I hope that the pace of this integration will improve in the years ahead.

In addition to soliciting the progress on the Strategic Plan 2010-2020 and Aichi Biodiversity Targets, the process of preparation of the Fifth National Report also provided an opportunity to share the plans for updating Biodiversity Strategy and Action Plan (BSAP) with the stakeholders. The government will make all efforts within the available resources to help provinces and regions prepare their own BSAP to ensure greater ownership and implementation. The help, so far, of international community in implementing the CBD is gratefully acknowledged, however, international assistance has fallen short of the expectations and we hope that the situation will improve. Pakistan needs greater international support to help build the human resource and institutional capacity.

We are also grateful to CBD Secretariat for their financial support for the 5th National Report and planned updating of the BSAP.

March 15, 2014

Syed Mahmood Nasir
Inspector General of Forests

# THE EXECUTIVE SUMMARY

**Importance of Biodiversity**

The ecosystems of Pakistan range from coastline in the south to the mountain ranges of the Himalayas and Hindu Kush in the north along with deserts and plains. Of the total land area, only 34.9 percent is utilized for cultivation. Forests form only 2.4 percent, and the remaining 62.7 percent area comprises desert, dry mountains and degraded uplands in moist and temperate biomes. Over 60 percent of population is rural and to some degree depends on nature and natural resources for their daily subsistence needs – forage, fuel etc. Under growing population and increasing anthropogenic pressure, the ecosystems are heavily strained and are thus degrading. The rangelands which cover the bulk of the landmass, sustain a growing livestock industry. All these ecosystems have played a crucial role in providing the platform for economic development and growth. The coastal zones of Sindh and Balochistan are highly productive ecosystems, with over 1000 species of marine fish and a thriving shrimp industry. The forests are a valuable source of timber and provide vital ecological services that protect watersheds and maintain soil productivity.

Despite the economic significance of these assets, there is no reliable baseline information to guide effective policy making. The only component of biodiversity whose value is well documented is trade in medicinal and aromatic plants (MAP). A market survey of medicinal plants in the year 2000, reported that Pakistan was the eighth leading country exporting MAPs with an estimated export volume of 8500 tons valued at US$5.45 million per annum. A 2007 World Bank report estimates a loss of seven billion rupees as a consequence of rangeland degradation and deforestation. The estimates of loss of fisheries and coastal zone degradation are not available.

**Exceptional Biodiversity and Ecosystems**

The following ecosystems of Pakistan are included in the list of global 200 priority ecosystems of the Millennium Ecosystem Assessment.

| Global 200 Eco-region | Conservation Status | Representation in PA System |
|---|---|---|
| **Western Himalayan Temperate Forests** | Critical or endangered | Adequate |
| **Rann of Kuchh Flooded Grasslands** | Critical or endangered | Adequate |
| **Tibetan Plateau Steppe** | Vulnerable | Adequate |
| **Indus River Delta** | Critical or endangered | Inadequate |
| **Arabian Sea** | Critical or endangered | No representation |

There has never been a comprehensive national assessment of biodiversity status and trends in Pakistan. The description of biodiversity of Pakistan in the Biodiversity Action Plan of Pakistan (2000) was compiled from information available in different publications. Even after the first BAP was prepared there has been no assessment of status and trends of biodiversity at national or regional level except some local studies. Recently, Pakistan Forest Institute has produced an Atlas of Land Cover of Pakistan but it does not give any assessment of change over time. Similarly, WWF Pakistan is making a district based assessment of forest cover, but again it does not include an assessment of change over time.

**Main Threats to Biodiversity**

Main threats to the terrestrial biodiversity are overgrazing, firewood collection, illegal hunting, and habitat disintegration due to infrastructure development. The main threats to biodiversity of inland waters are pollution from industrial and municipal waste. The coastal and marine ecosystems are also threatened from pollution. In addition, the major threat to marine biodiversity is netting of juvenile, for poultry feed, and catch of non-target species by trawler fishing.

**Impacts of changes in biodiversity**

There has not been any study in the country on the quantitative or qualitative impacts of declining biodiversity and ecosystems on human well-being and livelihoods in Pakistan. A 2007 World Bank study estimated a loss of Rs 7 billion due to rangeland degradation and deforestation. Apart from heavy dependence on import of timber, Pakistan is facing acute shortages of fuel wood and the demand for import of gas, for heating and cooking, is on the rise. In addition to increasing burden on the national economy due to ever increasing import bill, to meet the timber and firewood shortages, loss of biodiversity and ecosystem services is contributing to human suffering. Deforestation and degradation in the catchment areas has increased the siltation of dams; reducing their capacity for storage of water for irrigation and power generation. The last six years have seen worst electric power rationing in the country with power outages lasting for over 18 hours per day in some areas. This has caused tremendous losses in all sectors of economy.

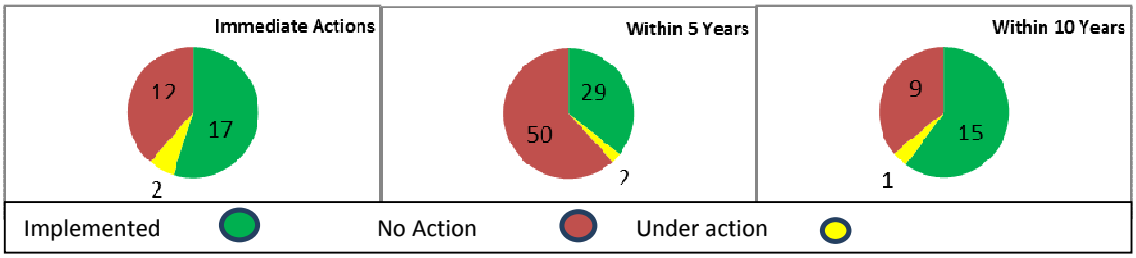
**Possible Future Changes for Biodiversity and their Impacts**

Pakistan has one of the highest population growth rate in the world with estimates varying from 1.7 to 2.03 percent. Pakistan's population was 33 million in 1950 and its rank was 14th in the world. Today it has reached around 180.71 million, making Pakistan the 6th most populous country in the world. It is estimated that if population growth continues at this rate, Pakistan will be the fourth most populous nation in the world in the next four decades. If the practice continues as usual for management of natural resources, the health and condition of the ecosystems will continue to decline resulting in a loss of biodiversity, ecosystem services, and livelihoods. According to FAO estimates Pakistan has already lost 50% of its forests and with the same practices, Pakistan will not be left with any intact natural ecosystems.

Pakistan is home to a large number of wild varieties of crops and if these species are lost then there will be serious negative consequences for maintaining the robustness of the crops. Pakistan is also home to a large number of endemic species that are most likely to be lost. Pakistan, with its growing population and economic problems, lacks financial resources to stem the tide of threats to biodiversity. The good news is that the global investments in Pakistan for conservation and sustainable use of biodiversity have created many islands of success and the need is to maintain the successes and find solutions for other problems through research and development.

**Implementation of Biodiversity Action Plan and Updated BSAP**

The Biodiversity Action Plan (BAP) of Pakistan was approved in the year 2000. It contained recommendations for 'immediate actions' to be taken within a year, 'short term' actions to be taken within five years, and 'long term actions' to be taken within ten years. Although 14 years have passed since the BAP was approved, it has not been fully implemented and many recommendations are either partially implemented or not implemented at all. A major reason for lack of proper implementation of the BAP is that the targets were too ambitious without taking into consideration the financial constraints and lack of human resource and institutional capacity. Furthermore, there was a lack of political will and insufficient financial allocation of the government resources. A summary of the implementation is given in the following pie charts.



The BAP of 2000 has served a useful purpose for mainstreaming biodiversity and implementation of the CBD. However, since its formulation, the CBD COP has formulated a number of thematic and cross cutting programmes of work and provided guidance through various other decisions. Currently COP is focusing on implementation of strategic Plan and Aichi Biodiversity Targets 2010-2020. There is a growing realization among all stakeholders that implementation of the strategic plan including Aichi Biodiversity targets and action on other CBD plans of works can be done best through regional BSAPs. The process of updating national BSAP and regional BSAPs has been initiated and is likely to be completed by the end of 2014.

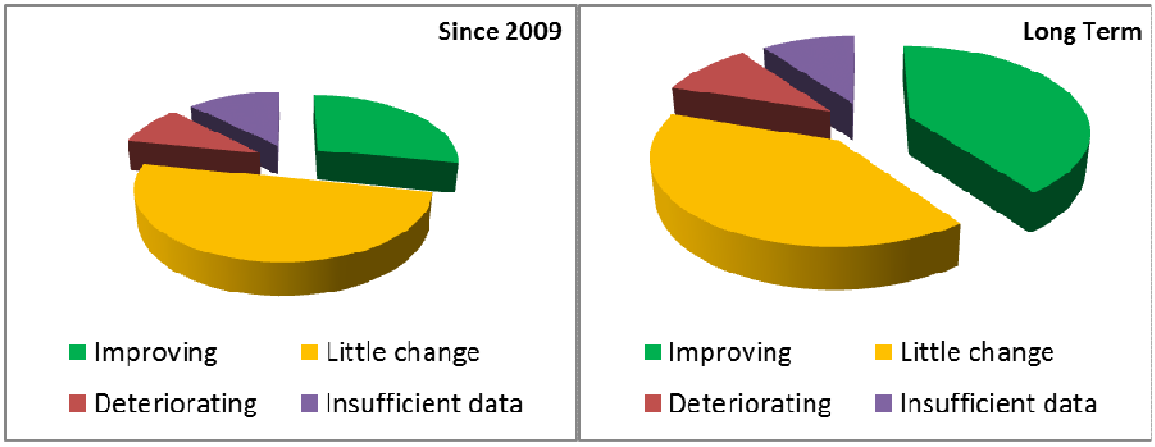
**Biodiversity Targets and Mainstreaming**

Apart from BAP, Pakistan has not fixed any national or regional biodiversity targets for implementation of CBD Strategic Plan 2010-2020 and Aichi Biodiversity Targets. This is primarily due to weak institutional arrangements for implementation of CBD at the national level and almost complete absence of any institutional arrangement at the provincial and regional level. There are no designated focal points for CBD implementation at the provincial level. The national authority for implementation of CBD has already initiated process for revision of BSAP and is working with the provinces and other regions to designate focal points for CBD and to constitute provincial and regional Biodiversity Working Groups (BWGs) to steer the process of preparation of regional BSAPs and provide coordination for implementation of CBD. It is hoped that the process will lead to setting national and provincial biodiversity targets.

There is neither a national biodiversity policy nor legal framework for mainstreaming biodiversity in the planning and development process. A national forest and wetland policy has been drafted but has not been approved yet. One of the four provinces – Khyber Pakhtunkhwa (KP) has approved a forest policy that includes provisions for conservation of forest biodiversity. In addition, biodiversity has been included in the curricula of many universities. However, there is increasing awareness about biodiversity and the need to conserve it, and use it sustainably. The main drivers of this change have been the large and medium scale projects funded by Global Environment Facility (GEF). The GEF Small Grants Program and celebration of international days like Biodiversity, Environment, Forests, Wetlands, Water, and Earth Hour etc. have also played a positive role in increasing awareness.

**Progress towards the Strategic Plan for Biodiversity 2010-2020 and its Aichi Biodiversity Targets**

The implementation of the Strategic Plan and action on Aichi Biodiversity did not receive serious attention due to the weak institutional capacity of the national authority for implementation of the CBD. The country has not fixed national targets so far, to implement the Strategic Plan, except an increase in the Protected Area coverage. Unfortunately a large percentage of the PAs included in the national inventory do not meet IUCN PAs definition. Similarly the true forest cover, according to many international estimates is on 2.4 percent, while the government statistics report 5.01 percent forest cover that includes trees growing on farmlands and the linear plantations. Despite the fact that no concerted effort was made to implement the Strategic Plan, activities of many sectors have contributed towards achieving the global targets under the Strategic Plan and Aichi Biodiversity Targets.



An analysis of the progress is based on written and verbal input provided by relevant stakeholders and key resource persons. The indicators mentioned are not the ones officially adopted but suggested by stakeholders. A summary of the progress on Strategic Plan 2010-2020 and Aichi Biodiversity Targets using the "traffic-light" scheme is presented as a pie chart above and also in table form below. The targets that covered multiple sectors were split by sectors, and therefore, the sum of targets summarized is greater than 20 Aichi targets.

| Strategic Goal | Improving | | Little change | | Deteriorating | | Insufficient data | |
|---|---|---|---|---|---|---|---|---|
| | Since 2009 | Long Term | Since 2009 | Long Term | Since 2009 | Long Term | Since 2009 | Long Term |
| A | 2 | 2 | 3 | 2 | 0 | 0 | 1 | 0 |
| B | 2 | 3 | 4 | 3 | 1 | 1 | 3 | 3 |
| C | 3 | 2 | 3 | 3 | 0 | 0 | 0 | 0 |
| D | 1 | 1 | 2 | 2 | 2 | 2 | 0 | 0 |
| E | 1 | 4 | 4 | 2 | 0 | 0 | 0 | 0 |
| TOTAL | 9 | 12 | 16 | 12 | 3 | 3 | 4 | 3 |

**Contribution of Actions to the Millennium Development Goals**

The Strategic Plan for Biodiversity 2010-2020 addressed two relevant MDG targets, but since the implementation of the plan itself remained weak, there was no significant contribution to the MDGs in the country. The relevant MDGs are:

> Target 7.A: Integrate the principles of sustainable development into the country policy and programmes and reverse the loss of environmental resources.
> Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.

**Lessons Learnt from the implementation of the Convention**

**Successes:** Biodiversity is now included in the curriculum of many universities. There is greater participation of stakeholders in planning and decision making; an equitable sharing of benefits has increased community participation in conservation. Following is an overview of the major successes in the country:

- Biodiversity is included in the curriculum of many universities.
- Biodiversity considerations are included in the environmental impact assessments.
- Gradual increase of community participation in conservation.
- Conservation status of many threatened and critically endangered species has improved.
- Protected Area coverage has increased and number of PAs under effective management has also increased.

**Weaknesses:** The following are some of the interventions that have not been so successful:

- Institutional arrangements for implementation of Convention are weak at national level.
- Institutional arrangements for implementation of Convention do not exist in provinces and regions.
- Policy and legal framework to implement the Convention.
- Basic studies on value of biodiversity, its contributions to human well-being and national economy.
- Studies of status and trends of biodiversity at national and provincial level.

**Recommendations:** The lessons learnt from the implementation of the Convention should form an integral part of the consultations with stakeholders during the updating of BSAP and need identification to improve the implementation of Convention. The updated BSAP should include actions and strategies to improve Convention implementation.

# Part I

# BIODIVERSITY STATUS, TRENDS, THREATS AND RELATION TO HUMAN WELL-BEING

## 1. 1. Importance of Biodiversity

It is estimated that over 60 percent of population in Pakistan is rural and depends on nature and natural resources – rangelands, forests, and fish - which are heavily strained. The ecosystems range from southern coastline to the mountain ranges of the Himalayas and Hindu Kush in the north cutting through deserts and plains. All these ecosystems have played a crucial role in providing the platform for economic development and growth. The rangelands which cover the bulk of the landmass, sustain a growing livestock industry. The coastal zones of Sindh and Balochistan are highly productive ecosystems, with over a 1000 species of marine fish and a thriving shrimp industry. The forests are a valuable source of timber and provide vital ecological services including watershed protection and maintenance of soil productivity. The land use trends and land under different forest types is shown in figure 1.

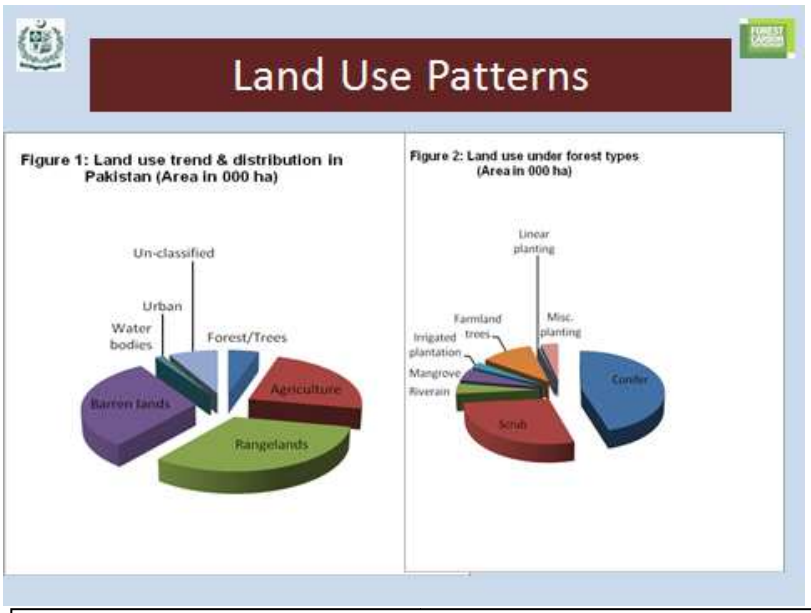



Figure 1: Land use patterns in Pakistan (Reproduced from: RPP for REDD+, GoP, 2013)

The only component of biodiversity whose value is well documented is trade in medicinal and aromatic plants (MAP). Although the data is from year 2000, however, it shows the economic value of this important component of biodiversity. The global market for medicinal and aromatic plants is estimated to be at least around US$60 billion. Aromatic and medicinal plants of Pakistan have a market of considerable size both nationally and internationally. The trade of the crude medicinal drugs and the number of personnel involved in the collection, distribution, trade and consumption are quite sizable. Crude plant-based drugs worth about Rupees (Rs) 120 million per year, are used in Pakistan. Drug survey of important markets of Pakistan conducted by Pakistan Forest Institute (PFI) indicated that the total turnover of dried herbs is worth more than Rs.169 million/year, while a substantial quantity of crude drugs along with their derivatives are also exported to other countries.

In a market survey of medicinal plants commissioned in 2000 by Inter Cooperation, it was reported that Pakistan was the eighth leading country exporting MAPs with an estimated export volume of 8500 tons valued at US$5.45 million per annum. Bulk of the medicinal plants used nationally and exported, grow in wild and are harvested

from mountain ecosystems. The same survey reported that Pakistan is also one of the largest importers of medicinal plants spending over US$130 million per year. Many of the imported MAPs also grow in Pakistan but these are imported to meet the heavy demand and inferior quality of indigenous species. There is, thus, a great potential to increase sustainable production of MAPs through proper management of the ecosystems, cultivation, and value addition that would bring economic benefit to local communities, improve the ecosystems' services, and reduce dependence on imports.

A fragile and damaged natural resource based living is major cause of poverty and to subsist, the poor are compelled to mine and overexploit the limited resources available, further aggravating the situation. This has created a further slump in the trend of poverty and environmental degradation. The degradation of these ecosystems is a concern, not just because of the intrinsic virtues of promoting responsible environmental stewardship, but also because of the economic consequences of environmental degradation. In 2007 World Bank estimated a loss of seven billion rupees as a consequence of the rangeland degradation and deforestation, which would have been doubled by now. The estimates of losses to fisheries and coastal zone degradation are not available.

Despite the economic significance of these assets there is no reliable baseline information to guide effective policy interventions. Therefore it should be a priority to update and refine assessments of the status and use patterns of key natural resources in order to enhance their productivity and contribution to growth and development. A World Bank study of 2007 suggests that if the natural resource depletion, pollution and consumption of fixed capital is factored in, gross national savings are cut by half.

## 1. 2. Exceptional Biodiversity and Ecosystems

The exceptional Biodiversity and ecosystems of the country that are biologically most significant and threatened areas of the biome, and require special management, are given in table 1. These ecosystems are included in the list of global 200 priority ecosystems of the Millennium Ecosystem Assessment highlighted by the Secretary General of the UN in the year 2000. The global ecosystems were divided into 238 eco-regions, of which 200 were picked up for priority action.

Table 1. The 200 Global Priority Eco regions represented in Pakistan

| Global 200 Eco-region | Conservation Status | Representation in PA System |
|---|---|---|
| Western Himalayan Temperate Forests | Critical or endangered | Adequate |
| Rann of Kuchh Flooded Grasslands | Critical or endangered | Adequate |
| Tibetan Plateau Steppe | Vulnerable | Adequate |
| Indus River Delta | Critical or endangered | Inadequate |
| Arabian Sea | Critical or endangered | No representation |

## 1. 3. Changes in the Status and Trends of Biodiversity

### 1. 3. 1. Overview of Biodiversity Status and Trends

There has never been a comprehensive national assessment on biodiversity status and trends in Pakistan. The description of biodiversity of Pakistan in the Biodiversity Action Plan of Pakistan (2000) was compiled by information available in different publications. Even after the preparation of first BAP, no assessment has been conducted on national or regional level on the status and trends of biodiversity,

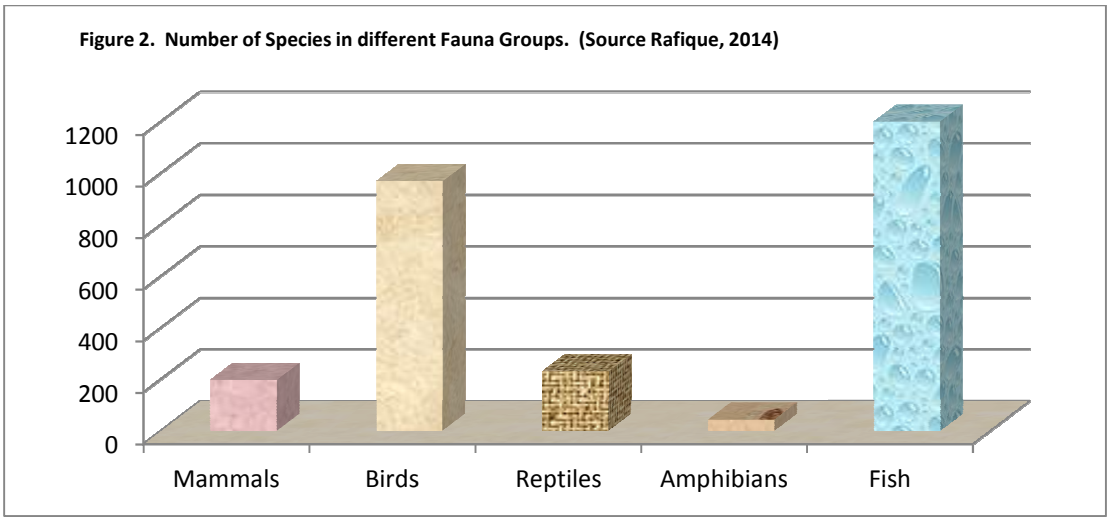



**Figure 2. Number of Species in different Fauna Groups. (Source Rafique, 2014)**

except for a recent Atlas of Land cover of Pakistan by the Pakistan Forest Institute. However, since then a number of local level research studies and field surveys have been undertaken. Furthermore, a couple of biodiversity information portals have been established, for example the Biodiversity Global Networking (BGN), Pakistan Museum of Natural History (PMNH), and Pakistan Biodiversity ClearingHouse Mechanism (CHM) established by the Climate Change Division (CCD) of the Government of Pakistan. Following description of faunal biodiversity is based on the compilation by Dr. Muhammad Rafique, Director General, Pakistan Museum of Natural History, and floral diversity by Dr. Zafeer Saqib, Islamic University Islamabad. The sources of information for number of species are available in the original reports.

**Mammals**

So far, 198 species of mammals have been recorded in Pakistan. The major component of the mammalian fauna is comprised of *Chiroptera* having 50 species followed by *Rodentia* having 48 and *Carnivora* having 35 species. Other major orders of mammals include *Artiodactyla* with 23 species, *Cetartiodactyla* with 20 and *Eulipothyphla* with 13 species. The orders *Lagomorpha , Primates* , *Pholidota*, and *Perissodactyla* each have 4, 3, 1, and 1 species respectively. All the species belonging to order *Cetartiodactyla* inhabit marine water except Indus Blind Dolphin which inhabits the freshwater of lower Indus River. The major habitats for the mammalian species are the mountain ranges of Himalayas, Karakoram and Hindu Kush, alongside Balochistan plateau, alpine pastures, Indus plain, Indus Kohistan, western hills, coastal areas, deserts of Sindh, Balochistan, and Punjab, and Himalayan Foothill Areas. Pakistan has very few endemic mammalian species forming only 3% of the total Mammalian fauna. The reason for this low endemism may be the connectivity of Pakistan with neighbouring countries through corridors formed by the mountain ranges, deserts, oceans, and plains. So far there is no exotic mammalian species in the wilds, in Pakistan.

**Birds**

The bird fauna of Pakistan consists of passerine birds having 330 species and non-passerine birds having 366 species. A high percentage of Pakistan's bird fauna is migratory, visiting Pakistan through the International Migratory Bird Route Number 4, the Indus flyway comprising over 30% of recorded species. The Himalayas, the Karakoram, AJK, Margalla Hills, and forested and agricultural tracts of Indus plain are the major habitats for the terrestrial bird species while the lakes, reservoirs and the coastal areas are the hotspots of the migratory water birds. Local migration of resident bird fauna is a major phenomenon in Pakistan. Birds migrate from northern Pakistan to lower altitudes when the higher altitude areas are packed with snow during the winter season whereas the birds inhabiting the plains move to the northern mountains to avoid the scorching heat of the summer sun. Moreover, many bird species are concentrated in the agricultural areas when crops are ready for harvesting.

**Amphibians**

The Amphibians in Pakistan include 15 species and subspecies of frogs, 10 species and subspecies of toads. None of the species of amphibians of Pakistan is either included in the IUCN Red list or listed in any of the in CITES Appendices. Majority of the frogs are found either in lower altitudes of the plains or sub-mountainous areas, except the Deosai Frog (*Scutiger nyingchiensis*) which is found above 4000 m. The toads on the other hand are found in plains, sub-mountainous areas as well as the higher altitude.

**Leaf-Nosed Viper** (*Eristicophis macmahonii*). **Photo: Naeem Ashraf Raja**

**Reptiles**

The reptilian fauna of Pakistan consists of three species and subspecies of marine turtles, three species and subspecies of tortoises, 8 species and subspecies of fresh water turtles (Khurram et al, 2011) one crocodile, one gavial (believed to be extinct in wild), 120 species and subspecies of lizards, 95 species and subspecies of snakes, of which 14 are sea snakes. Province of Balochistan, especially Chagai Desert is the major habitat for the reptilian fauna of Pakistan. Majority of the components of the reptilian fauna found in Balochistan are also shared by their eastern Iranian counterparts, though there are still many species endemic to this region. The illegal trade in live reptiles for herpetoculture is seriously threatening the reptile populations in the country.

**Fish**

Pakistan has about 1,000 marine water species, and 198 species of freshwater fish fauna with 12 introduced artificially. Marine water species include anadromous, catadromous, pelagic and benthic fish fauna. The fish fauna is predominantly south Asian, with some west Asian and high Asian elements. Fish fauna found in the Northern Areas of Pakistan comprises 20 species and has completely High Asian component restricted only to the Gilgit-Baltistan region of the country. Major component of the fish fauna especially the warm water fishes are restricted to the Indus Plain comprising about 140 fish species. The genus *Schistura* is restricted to sub mountain areas while the genus *Triplophysa* is mainly confined to high altitude areas of the country. The snow trout, an introduced species is found in the Himalayas, Hindukush and Karakoram mountain ranges.

The inland water resources of Pakistan are dominated by the Indus River System, comprising river Indus, Jhelum, Chenab, Ravi, and Sutlej that flow from northeast to south and fall into Arabian Sea passing through the Indus Delta. Kabul River originating in Afghanistan falls into the Indus, near Attock. Other than the Indus River system, there are some small rivers in Balochistan province all of which fall into the Arabian Sea near Makran coast. Pakistan has one of the world's largest man-made canal irrigation systems, which consists of a number of large dams, barrages, and a network of irrigation canals and waterways. The fish fauna is distributed in these water bodies according to the optimum requirements of their physical and chemical characteristics.

**Cetaceans**


Humpbacked dolphin, © WWF-Pak/ Ghulam Rasool

Pakistan's cetacean population is threatened indirectly by the removal of components in the food chain on which they thrive, as well as directly by the impacts of pollution, ship strikes and entanglement in fishing gear. The loss of cetacean population in the area would represent not only a decline in biodiversity, but also the loss of resources that could be exploited sustainably with the help of ecotourism, by the local fishing community. Twelve species of cetaceans are reported from Pakistani waters. WWF Pakistan's Cetacean Conservation Pakistan (CCP) project working with the marine fishers helped identify entanglement in fishing gear (in the light of major recent increase in fish export by Pakistan) and opportunistic exploitation for use as food, bait or medicine as two major threats to local cetaceans.(Source: WWF Pakistan)

**Sharks**

Sharks form an important part of the fisheries of Pakistan. Sharks are inclusive of sawfishes, rays and skates belonging to subclass *Elasmobranchii* which are characterized to have cartilage (lack true bones) as skeletal block, slow reproduction, predatory nature and having gill slits instead of gill cover. Sharks occupy almost all habitats, including shallow intertidal waters to greater depths of the ocean. Some species even venture in freshwater (bull shark and saw fishes). There are 43 species of sharks, and among them Big eye Thresher Shark (*Alopias superciliosus*), Silky Shark (*Carcharhinus falciformis*), Shortfin Mako (*Isurus oxyrinchus*) and Oceanic White-tip Shark (*Carcharhinus longimanus*) seems to be of frequent occurrence in gillnet catches. Bigeye Thresher and Shortfin Mako are the most abundant.

**Rays**

Although 47 species of rays and guitarfishes are reported from Pakistan, of these only 14 species are found as by-catch of tuna gillnet operations. Giant Manta Ray, Pygmy Devil Ray, Spine-tail Mobula and Common Stingray were observed to be of common occurrence.

**Whale Sharks**

Whale shark (*Rhincodon typus*) is frequently observed in coastal areas of Pakistan. It is found both in coastal and offshore waters and reported to bask in the area between Churna Island and Ras Malan. According to the information collected by WWF during a rapid assessment survey, about 2 to 5 whale sharks are entangled in tuna gillnets every year. Fishermen do not release entangled whale sharks and bring it to beach or to landing centre and take out its liver. Oil is extracted from its liver for smearing the hull of the fishing vessels which makes it smooth and prevents against boring and fouling animals. Meat is sold for production of fish feed.


Shark fisheries are one of the oldest fisheries of Pakistan. The time-series data from 1980 onwards show that tuna landings from Exclusive Economic Zone (EEZ), Sindh and Balochistan provinces are increasing. Landings of sharks including that of bycatch from 1999-2011, indicates a decline of more than 80%. Presently shark bycatch of tuna fisheries is about 3 to 4 % of the tuna landings. With the continued harvest of the apex predators their population has declined since 1999 (figure 3) and as a result, a record increase of Indian Mackerel was noticed which indicates ecosystem imbalance caused by removal of the predators. (Source: WWF, Pakistan)

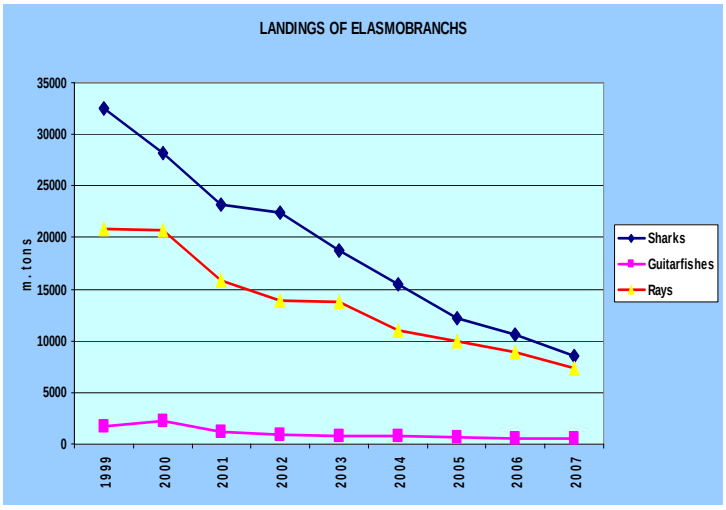



Figure 3. Graph showing landings of sharks, guitar fishes, and rays between 1999 – 2007.

**Sea Turtles**

Globally there are eight species of marine turtles and they are all classified as endangered. According to FAO species identification sheets, five species of marine turtles are reported from Indian Ocean (area 51), but only two species: *Chelonia mydas* (Green Turtle) and *Lepidochelys olivacea* (Olive Ridley Turtle) were regularly nesting on the beaches of Pakistan in the recent past. Even at that time the nesting ratio of Olive Ridley Turtle was one out of ten. During the recent past, the breeding intensity of Olive Ridley Turtle has further declined and during the last 10

years its nesting on any known breeding site has not been reported. During recent surveys of Balochistan Coast, only Green Turtle (*Chelonia mydas)* was sighted at Astola Island. There are two other famous sites in Balochistan for Green Turtle nesting: Daran (Jiwani) and Taak (Ormara). Hawksbill Turtle (*Eretmochelys imbricate*) occasionally visits the area but does not nest. A dead Leatherback Turtle (*Dermochelys coriacea*) was also reported in December 2001. Sandy shores of Sandpit and Hawkes Bay beach, important for green turtle nesting, has been observed along the stretch of 20 km near Karachi Sindh. (Contribution: Abrar ul Hasan, Marine Biological Research Laboratory, Zoological Survey Department Karachi

Green Turtle (*Chelonia mydas*) and Olive Ridley Turtle (*Lepidochelys olivacea*) are the two species of marine turtles that nest along the Sandspit and Hawkesbay beaches at the coast of Arabian Sea near Karachi. However in recent past, only Green Turtle nesting have been seen. The Sandspit and Hawkesbay beaches are famous recreational points and according to one estimate, more than 100,000 people from Karachi and the country visit the area annually. About 205 brick and mortar huts have been established along these beaches. The visitors usually throw the garbage on the site and those visiting the area at night usually disturb the egg laying process of the marine turtles. Predation by crows, kites, gulls and dogs is also a significant threat as they feed on the eggs and hatchlings.

Surveys have been carried out to determine the number of species of turtles. Moreover, a lot of support to the studies has been provided by assessment of Bycatch Project, which indicates a large foraging population of Olive Ridley Turtles. A population study of Green Turtle was undertaken for their nesting patterns at Hawksbay area. The results are shown in table 2. (Source: WWF, Pakistan)

Table 2. Green Turtle Population recorded at Sandspit and Hawkesbay Beaches, Karachi. (Source: WWF, Pakistan)

| Month/Year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Jan | 51 | 63 | 58 | 42 | 59 | 54 | 49 | 67 | 84 | 73 |
| Feb | 11 | 27 | 31 | 22 | 35 | 46 | 38 | 15 | 41 | 42 |
| Mar | 17 | 21 | 23 | 19 | 27 | 15 | 25 | 14 | 17 | 17 |
| Apr | 1 | 4 | 5 | 3 | 2 | 1 | 3 | 2 | 5 | 5 |
| May | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| Jun | 31 | 39 | 27 | 35 | 41 | 38 | 43 | 29 | 42 | 18 |
| July | 175 | 143 | 153 | 175 | 193 | 187 | 179 | 191 | 149 | 117 |
| Aug | 341 | 275 | 374 | 326 | 368 | 373 | 386 | 389 | 217 | 224 |
| Sep | 381 | 374 | 353 | 349 | 358 | 381 | 391 | 375 | 352 | 359 |
| Oct | 301 | 316 | 381 | 487 | 511 | 498 | 492 | 507 | 582 | 582 |
| Nov | 408 | 459 | 473 | 479 | 541 | 553 | 549 | 577 | 544 | 475 |
| Dec | 196 | 291 | 234 | 238 | 283 | 265 | 268 | 287 | 270 | 189 |
| **Total** | **1914** | **2014** | **2113** | **2176** | **2219** | **2412** | **2425** | **2454** | **2304** | **2103** |

**Coastal Bird Diversity**

On the 1046 Km long coastline of Pakistan, stretching from Sir Creek adjacent to Indian boarder on the south-east coast, to Jiwani near Iranian boarders on the west coast, at least 10 hotspots of avifauna diversity are reported. The importance of some of these sites is well recognized globally as wintering grounds for migratory birds. The sites of Indus Delta, Miani Hor, Ormara, Astola Island and Jiwani-Gwatar Bay have been declared as Ramsar Sites. In a study on Makran Coast (Balochistan), for the assessment of bird diversity, three localities, Ormara, Pasni, Gawadar, Jiwani were surveyed and a total of 122 species of birds belonging to 41 families and 16 orders were recorded.

Blackwinged Stilt (Photograph by Abrar ul Hasan)

The important species like Dalmatian Pelican (*Pelecanus crispus*), White Pelican (*Pelecanus oncrotalus*) and Lesser Kestrel (*Falco naumanni*) have been recorded from these sites. These species come under Appendix 1 of Convention on Migratory Species (CMS) that lists endangered migratory species. Twenty-seven (27) species of birds were also recorded from these localities which come under Appendix II of CMS which describes migratory birds, having unfavorable status among Range States but not declared endangered as yet. Out of 27 species,White Spoonbill (*Platalea leucorodia)* Greater Flamingo *Phoenicopterus rubber*, Common European Kestrel *(Falco tinnunculus)* Sandwich Tern *(Thalasseus sandvicensis)* Slender-billed Gull *(Larus genei*) are some of the birds which come in Appendix II of CMS. The Shannon-Weiner index for birds is high at Ormara (2.66) and lowest in Pasni (1.99). This is mainly due to low multiplicity of variety at Pasni with 80% of the total population belonging to the family of gulls and terns which produce negative effect on equitability (relative abundance). Similar is the case with bird community at Gawadar/Jiwani where higher numbers in some of the families (Rallidae, Phalacrocoracidae and Laridae) produce negative effect on general equitability while species richness highest with 91 at Gawadar/Jiwani. The index at Gawadar/Jiwani is 2.30. (Contribution: Abrar ul Hasan, Marine Biological Research Laboratory, Zoological Survey of Pakistan Karachi)

**Invertebrates**

So far, more than 5,000 species of invertebrates including insects have been identified in Pakistan, 1,000 species of true bugs, 400 species of butterflies and moths, 110 species of flies and 49 species of termites. Other invertebrates include 109 species of marine worms, over 800 species of mollusks (700 marine mollusks, 100 land snails, and 355 species of nematodes). The total number of the species of butterfly probably exceeds 400 with high rates of endemism in the *Satyrids, Lycaenids and Pierids* families. Butterflies of high altitudes are largely either endemic or are derived from boreal fauna from the west. In the northern mountains alone, 80 species have been recorded, many of which are endemics.

**Higher Plants**

The number of higher plants in Pakistan can be estimated close to 7000 species (6895) (Tables 3, 4). The main source of information regarding higher flora of Pakistan (Angiosperms, gymnosperms and pteridophytes) is an online comprehensive inventory of the plants *"Flora of Pakistan"* (http://www.tropicos.org/Project/Pakistan and http://www.efloras.org/flora_page.aspx?flora_id=5 accessed: 10/01/14). The flora is claimed to have included an

**Table 3:** Summary of number of taxa published in flora of Pakistan

| Group | Families | No. Genera | No. Species |
|---|---|---|---|
| Dicot | 168 | 1273 | 4577 |
| Gymnosperm | 9 | 14 | 38 |
| Monocot | 41 | 323 | 1180 |
| **Total** | **218** | **1610** | **5795** |

inventory of more than 6,000 species from the country available in a searchable web-based format. This inventory includes at least 218 volumes of the *Flora* with the completion of the final volumes being awaited. These volumes will include family *Scrophulariaceae*, remaining tribes of families *Rosaceae and Asteraceae* (already published partly), and the pteridophytes (ferns). These incomplete volumes will provide accounts of about 1,100 species (6—10 volumes). A detailed summary of published flora has been documented in Table 3.There are about 12,000 - 15,000 named species of ferns worldwide. The number of species of ferns reported from Pakistan is 133 of which 41 belong to genera and 9 to the families from Pakistan and AJK. The vast majority grows in mixed coniferous forests in mountainous regions forming a substantial component of terrestrial plant communities.

**Pteridophytes**

The number of the species of Pteridophytes reported from Pakistan is shown in Table 4.

**Table 4:** Summary of number of Pteridophytes taxa in Pakistan

| Group | Families | No. Genera | No. Species |
|---|---|---|---|
| Pteridophytes | 20 | 56 | 200 |
| **Grand Total** | 20 | 56 | 200 |

**Bryophytes**

Though worldwide the bryophytes are second largest group of land plants after flowering plants, yet they are hardly known in Pakistan. In total 1126 bryophyte species have been reported from Pakistan (Table 5).

**Table 5:** A summary of number of Bryophyte taxa in Pakistan

| | Families | No. Genera | No. Species |
|---|---|---|---|
| Bryophtes | 97 | 328 | 1126 |
| **Grand Total** | 97 | 328 | 1126 |

**Algae**

A summary statistics of the algal flora is documented in table 6.

**Table 6:** A summary of number of Algal flora in Pakistan

| | Families | No. Genera | No. Species |
|---|---|---|---|
| Algae | 121 | 266 | 913 |
| **Grand Total** | **121** | **266** | **913** |

**1. 3. 2. National Forest Cover Assessment**

The Global Forest Watch initiative of the World Resources Institute (WRI) has reported that Pakistan lost 10,000 ha of forest between the years 2000 to 2012 and gained less than 1000 ha in the same period. Under the United Nations (UN) Millennium Development Goals (MDG) in 2005, Pakistan committed to increase its forest cover from 4.8 to 6.0 % by 2015. Pakistan is obligated to report on the status of forests in a transparent manner to various international conventions and UN agencies. Keeping in view the achievement of this goal, geographical information system (GIS) and Remote Sensing based technologies are employed to assess forest cover from the last two decades in Pakistan. The aim of the aforementioned forest mapping activities is to estimate the national forest cover at federal and provincial level. World Wide Fund for Nature - Pakistan (WWF-Pakistan) is undertaking

this task for the Pakistan Environmental Protection Council (PEPC). In this study, district maps are being developed which will form the basis of the national scale mapping of forest resources in Pakistan. The results (unpublished) of this study are given in table 8 (Source: WWF Pakistan, personal communication).

A recent proposal submitted by the Government of Pakistan (GoP) to the World Bank (WB) for funding under REDD+, includes following (table7) time series data of vegetation cover with trends.

Table 7. Status of vegetation cover and annual change. (Reproduced from RPF for REDD+, GoP, 2013).

| Vegetation Type | Status of Vegetation Cover (000 ha) | | | Annual change rate % (Base year 1992) | |
|---|---|---|---|---|---|
| | *1992* | *1997* | *2004* | *5Yr Rate* | *10Yr Rate* |
| Conifer | 1913 | 1479 | 1512 | 4.54(-) | 2.09(-) |
| Scrub | 1191 | 1652 | 1323 | 7.74(+) | 1.11(+) |
| Riverine | 173 | 144 | 150 | 3.35(-) | 1.33(-) |
| Mangrove | 207 | 159 | 158 | 4.64(-) | 2.37(-) |
| Plantation | 103 | 165 | 174 | 12.04(+) | 6.89(+) |
| Total Forest | 3587 | 3599 | 3317 | 0.06(+) | 0.75(-) |
| Rangeland | 28505 | 22645 | 23546 | 4.11(-) | 1.74(-) |
| Total Types | 32092 | 26244 | 26863 | 3.64(-) | 1.63(-) |

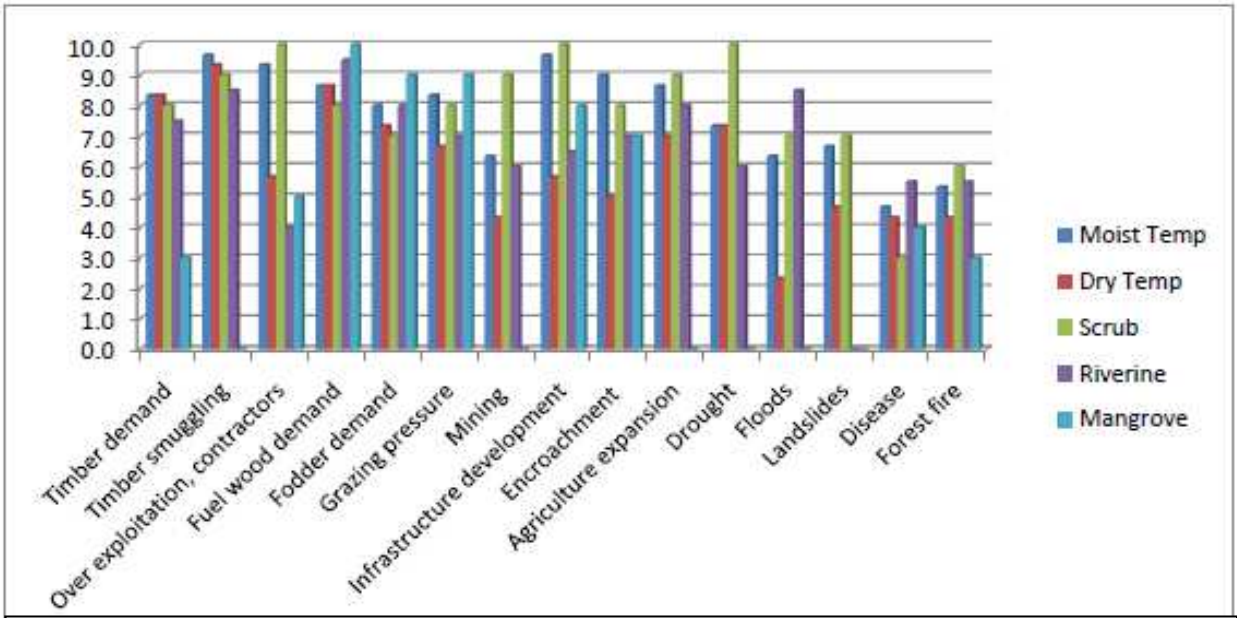



Figure 4. Major threats to different forest types (Reproduced from RFP REDD+, GoP, 2013)

Table 8. Forest cover in some districts of Pakistan.

| Province | District Name | Forested Land % | Province | District Name | Forested Land % |
|---|---|---|---|---|---|
| Khyber Pakhtunkhwa | Abbottabad | 54.52 | Sindh | | |
| | Bajaur Agency | 9.88 | | Naushahro Feroze | 1.68 |
| | Batagram | 53.72 | | Hyderabad | 1.35 |
| | Buner | 33.99 | | Shaheed Benazir Abad | 1.94 |
| | Chitral | 5.98 | | Thatta | 1.16 |
| | Hangu | **8.37** | | Sukkur | 1.46 |
| | Karak | 3.68 | | Shikarpur | 6.39 |
| | Khyber Agency | 17.09 | Punjab | Rawalpindi | 18.08 |
| | Kohat | 5.65 | | Jhelum | 4.25 |
| | Kohistan | 30.18 | | Gujrat | 1.40 |
| | Kurram Agency | 10.74 | | Mianwali | 6.15 |
| | Lower Dir | 20.39 | | Muzaffargarh | 0.74 |
| | Mansehra | 43.40 | Balochistan | MusaKhel | 13.16 |
| | North Waziristan | 6.34 | | Ziarat | 16.23 |
| | Orakzai Agency | 32.82 | | Sibi | 1.16 |
| | Shangla | 59.61 | | Harnai | 8.29 |
| | South Waziristan | 6.21 | | Zhob | 1.70 |
| | Swat | 32.10 | | Pishin | 0.99 |
| | Tribal Area(Bannu) | 0.01 | | Quetta | 0.65 |
| | Tribal Area (DIKhan) | 0.84 | | Sherani | 0.01 |
| | Tribal Area(Kohat) | 9.08 | Gilgit Baltistan | Astor | 6.33 |
| | Tribal Area(Peshawar) | 14.90 | | Diamer | 13.46 |
| | Tribal Area(Tank) | 0.45 | | Ghanche | 0.50 |
| | Upper Dir | 41.89 | | Ghizar | 0.62 |
| Azad Jammu Kashmir | Baagh | 74.12 | | Hunza Nagar | 0.75 |
| | Kotli | 76.91 | | Skardu | 0.62 |
| | Muzaffarabad | 72.32 | | Gilgit | 8.33 |

## 1. 4. Main Threats to Biodiversity

A graphical representation of main threats to different forest types on a scale of 1 to 10 is given in figure 4. The following is a brief description of the threat to biodiversity in major biomes in the country.

**Alpine and Sub alpine Pastures**

The alpine and subalpine pastures are used for cattle grazing by the local communities. In addition, the transhumant also spend summers in some regions along with their goats, mules and horses. Grazing in alpine and subalpine pastures is not regulated under law, however, in some regions, local communities have traditional management practices of regulating grazing season and rotational grazing. There is no data on the health and condition of these pastures, however, there is common belief that the pastures are overgrazed and health and condition of the ecosystems is deteriorating.

**Temperate and Sub-Tropical Biomes**

Most of the natural forests in this biome have either been cleared for farming or are heavily degraded due to deforestation, over grazing, and faulty agricultural practices. Another leading cause of loss of biodiversity is fragmentation of habitat due to expanding human settlements and infrastructure development. The political demand to connect the scattered settlements by road has led to the construction of a large road network, without any measures for slope stabilization, which has triggered numerous small and large landslides. Natural forests that are under government management are still surviving, but are generally burdened with right and heavy dependence of communities for fuel wood. As a result these forests are fast degrading due to increasing anthropogenic pressure. Once the area is deforested, it will not regenerate naturally due to heavy grazing pressure. Illegal hunting, unsustainable harvest of NTFPs, and killing of predators are some of the additional threats to the biodiversity.

Leopard killed by villager in AJK , Photo by Naeem Iftikhar

To better understand the reasons for the declining forests, a study was commissioned by Inter-Cooperation in 2010 at the request of the government of Khyber Pakhtunkhwa (KP) province. The study identified that the recorded commercial harvesting accounted for only about 2.2% of the total wood consumption, whereas local consumption for fire-wood accounted for 80.0%, and other unrecorded out-takes accounted for 17.8%. According to the study, the forest deterioration was mainly resulting from the fire-wood consumption of the local people. The study concluded that with an ever-growing population the forest will continue to deteriorate as the forest cannot be protected against the subsistence need of the local people.

**Sub Humid Tropical Biomes**

These biomes predominantly comprise medium sized evergreen trees and bushes. The reason of deforestation and degradation is primarily the same as that of temperate and sub-tropical biome. Illegal hunting, unsustainable harvest of NTFPs, and killing of predators are some of the additional threats to the biodiversity in this biome as well.

**Arid Rangelands**

The arid rangeland biomes are highly degraded due to overgrazing, uprooting of woody vegetation for fuel, and in some cases clearing of land for seasonal cultivation. A number of attempts have been made since late 1950's to introduce North American model of range management, but without any

Photo Courtesy Balochistan Forest Department

success. As in other terrestrial biomes, Illegal hunting, unsustainable harvest of NTFPs, and killing of predators are some of the additional threats to the biodiversity.

**Mangrove Biome**

The largest tract of arid mangroves is found along the coast of Pakistan. Over 110,000 ha of the coastline are under mangrove forests. Coastal communities as well as the local fisheries are dependent on this ecosystem. However, despite having considerable importance for the national economy due to its role in fisheries, the significance of mangrove biomes in terms of ecological and economic value has remained undocumented and poorly understood. The water of the River Indus which flows into the delta is heavily polluted from a variety of industrial effluents, sewage, solid waste and nutrient-enriched water from agricultural fields. The area is affected by increased salinity due to intrusion of sea water thus degrading the soil, whereas the diversion of river water for irrigation and a heavy dependence of coastal communities on these forests for timber, fuel, and grazing are also exerting a lot of pressure on this biome. Another major threat to this biome is the netting of juvenile fish for sale to poultry feed industry. Realizing their ecological and economic importance, major initiatives are underway to restore health of this biome through reforestation and assisted natural regeneration.

**Inland and Marine Water Biome**

Major threats to the inland and coastal waters are indiscriminate discharge of industrial, municipal and return-agriculture flow through drainage structure. Most cities and towns near rivers or the coast discharge their untreated municipal wastewater into the natural waters. The parameter of major concern is organic matter that causes depletion of dissolved oxygen, toxic chemicals, and other chemicals resulting the change in water chemistry. The discharge from thermal power plants is also a cause of major concern as in addition to the mercury poisoning, high water temperature of discharge results in death of aquatic life and degradation of the inland water and marine ecosystems.


Photo: Uzma Noureen / PWP

In case of marine ecosystems, another major cause of pollution is unwanted marine flora and fauna caught in trawler nets that is dumped back in to the water. Overfishing in inland waters and sea, illegal trade in meat of fresh water turtles, and invasive aliens like Tilapia fish are other threats to these waters. Construction of barrages on rivers for diverting river water for irrigation has restricted spawning movements of many fish species and isolated Blind Indus Dolphin populations.

## 1. 5. Impact of the changes in biodiversity for ecosystem services and the socio-economic and cultural implications of these impacts

There has not been any study in the country on the quantitative or qualitative impacts of declining biodiversity and ecosystems on human well-being, and livelihoods in Pakistan. The World Bank study mentioned in section 1.1 above, estimated a loss of Rs 7 billion in 2007 due to rangeland degradation and deforestation. Apart from heavy dependence on import of timber from abroad, Pakistan is facing acute shortages of fuel wood and the demand for the import of natural gas for heating and cooking is on the rise.

In addition to the burden on national economy, with ever increasing import bill to meet the shortage of timber and fuel wood, loss of biodiversity and ecosystem services is contributing to human suffering. Deforestation and

degradation in the catchment areas has increased the siltation of dams, reducing their capacity for storage of water for irrigation and power generation. The last six years have seen worst electric power rationing in the country, with power outages lasting for over 18 hours per day in some areas. This has caused tremendous loss of livelihood in all sectors of economy.

Destabilization of slopes due to deforestation and infrastructure development has increased incidence of landslides resulting in loss of lives, property and damage to infrastructure. It was observed that in the major earth quake that hit KP and AJK in 2005, the areas worst affected by landslides were those that had been denuded of the trees. The pollution in inland waters and coastal areas is hurting fish production and local livelihoods. The increase in livestock numbers that thrive on arid biomes are resulting in land degradation, which has caused heavy livestock losses in the recent droughts in the country. While there are conflicting views on role of forests and vegetation on preventing floods, it is commonly believed that a good vegetative cover in catchments areas delays the deluge, giving more time to take measures to reduce losses of human lives and property. In the last five years, Pakistan has seen worst floods in history causing sudden rise of waters in the rivers. As a result causing human tragedy and property losses.

### 1. 6. Possible future changes for biodiversity and their impacts

Pakistan has one of the highest population growth rate in the world with growth rate estimates varying from 1.7 to 2.03 percent. Pakistan was 33 million in 1950 and its rank was 14th in the world. Today, it has reached around 180.71 million making Pakistan the 6th most populous country of the world. It is estimated that if population growth rate continues at this level, Pakistan will be the fourth most populous nation in the world in the next four decades. If the business continues as usual, management of natural resources and the condition of the ecosystems will continue to decline resulting in the loss of biodiversity, ecosystem services, and livelihoods. According to FAO estimates Pakistan has already lost 50% of its forests and in the current scenario, Pakistan will not be left with any intact natural ecosystems.

Pakistan is home to a large number of wild relatives of crops and if these species are lost there will be serious negative consequences for maintaining the robustness of the crops. Pakistan is also home to a large number of endemic species that are likely to be lost. The loss and degradation of natural resources needs to be halted -- not only for the economic well-being of the local people but also for the huge global benefits. Pakistan with its growing population and economic problems lacks financial resources to stem the tide of threats to biodiversity. The good news is that the global investments in Pakistan for conservation and sustainable use of biodiversity have created many islands of success and the need is to retain the success and find solutions for other problems through research and development.

**Part II**

# NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN

## 2. 1. Implementation of Biodiversity Action Plan

The Biodiversity Action Plan (BAP) of Pakistan was approved in the year 2000. It contained recommendations for 'immediate actions' to be taken within a year, 'short term' actions to be taken within five years, and 'long term actions' to be taken within ten years. Although 14 years have elapsed since the BAP was approved, it has not been fully implemented and many recommendations are either partially implemented or not implemented at all. A major reason for lack of proper implementation of the BAP is that the targets were too ambitious and set without taking into consideration the financial constraints and lack of institutional and human resource capacity. Furthermore, there was no strong political will, and insufficient financial allocation from government resource.

A Directorate of Biodiversity was created in the Ministry of Environment (MoE) in the year 2006, but a full time Director was not appointed until 2011. A Biodiversity Working Group (BWG) was constituted during the preparation of the BAP for interdepartmental coordination and for steering implementation of the BAP. After the preparation of the BAP, the BWG has remained dormant due to lack of financial resources to convene meetings. An overview of the BAP implementation is given in table 9. The numbers in the table refer to specific actions as described in Section 4 of the BAP.

**Table 9** Progress on the implementation of the Biodiversity Action Plan.

In addition to description of the implementation status, where necessary traffic lights have been used to reflect assessment of change over time:

 = Improving

 = little or no overall change

 = Deteriorating

| BAP Recommendations | Immediate Actions (within 1 year) | Specific Actions | Implementation Status |
|---|---|---|---|
| **Policy/ Planning** | Adopt BAP (1.1) | Action 1.1. Secure high level and multi-sectoral support for its implementation. | The BAP was approved in 2000.  |
| | Adopt Biodiversity Policy (1.2) | Action 1.2. Prepare and adopt the new Wildlife (or "Biodiversity") Policy, at both the provincial and federal levels. | Not done  |
| **Legislation** | Enact Model Wildlife Law (2.3) | Action 2.3. Ensure that the draft Model Wildlife Law currently under review embodies conservation measures suggested for adoption by the CBD and other related conventions. | Model Wildlife Law was drafted but not enacted. Out of 4 provinces and 2 territories wildlife law revised in one Province - Khyber Pakhtunkhwa (KP).  |

| | | | |
|---|---|---|---|
| | Finalize rules for PEPA '97 (2.6) | Action 2.6. Finalize detailed rules, regulations, and guidelines for the implementation of IEE/EIA under the Environmental Protection Act 1997, paying due regard to the need for addressing matters relating to the conservation of biodiversity. | The Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000 were formulated and enacted. But no specific provision is made for conservation of biodiversity.  |
| | Protect species presently subject to illegal trade (3.3) | Action 3.3. Take immediate remedial measures to protect species that are presently subject to illegal trade | Pakistan Trade Control of Wild Flora and Fauna Act, 2012 enacted.  |
| **Identification/ Monitoring** | Establish biodiversity centre(s) (4.1) | Action 4.1. Establish a national centre (or several provincial centres) to coordinate biodiversity identification and monitor activities. | Biodiversity centres not established.  |
| | Identify conservation priorities (4.2) | Action 4.2. Identify national priorities for biodiversity conservation, including threatened ecosystems and species, "hot spots", and zones of endemism. | Protected Areas System Review and gap analysis completed.  |
| | Foster information sharing (4.6) | Action 4.6. Foster the sharing of information on biodiversity among research institutions, government agencies, NGOs, and local communities. The incorporation of traditional (local) knowledge with science has great potential for strengthening the information base on biodiversity. | A CHM was established in 2012. Plant and Animal database established at Pakistan Museum of Natural History. Flora of Pakistan available online.  |
| ***In-Situ* Conservation** | Prepare PA system review (6.2) | Action 6.2. Carry out a thorough protected areas system review to identify existing gaps. On the basis of the review, prepare a protected areas system plan for Pakistan. | Completed.  |
| | Identify priority areas for international designation (6.3.4) | Action: 6.3.4. Identify priority areas for international designation under the World Heritage Convention, the UNESCO Man and Biosphere Programme, and the Ramsar Convention. In particular, take measures to promote the designation of the Central Karakorum National Park as a World Heritage Site; initiate a feasibility study to assess the potential of the Indus Delta as a Biosphere Reserve; adjust and expand the list of designated Ramsar sites according to the revised criteria adopted at Montreux in 1990. | Tentative list prepared. A Man and Biosphere Reserve (MaB) established in Ziarat. Dossier for nomination of central Karakorum National Park as MaB Reserve drafted.  |
| | Explore potential for | Action: 6.3.5. Explore the potential for | Initiative for Siachen Peace |

| | | | |
|---|---|---|---|
| | trans-boundary Peace Parks (6.3.5) | establishing trans-frontier "Peace Parks" with neighboring countries | Park explored. ≈ |
| ***Ex-Situ* Conservation** | Compile directory of conservation initiatives (8.2) | Action 8.2. Compile a directory of existing ex-situ conservation initiatives, including herbaria, livestock breed farms, genome banks, germplasm collections, plant breeding centres, zoological gardens and private collections. | Directory not prepared ✗ |
| | Evaluate existing programs (8.3) | Action 8.3. Evaluate the scope and effectiveness of existing programmes at conserving key components of Pakistan's biodiversity. | PA gap analysis completed. ✓ |
| | Identify priority species and genetic resources (8.4) | Action 8.4. Identify priority species and genetic resources in need of further ex-situ conservation efforts. This should include an assessment of the need for captive breeding programmes for commercially valuable, threatened species of indigenous wild fauna and medicinal plants. | Not done ✗ |
| **Sustainable Use** | Develop criteria for Sustainable use (10.2) | Action 10.2. Develop criteria for sustainable use and prioritize the types of uses (local subsistence versus commercial) that will be allowed in different areas. | Not done ✗ |
| | Promote community-based conservation projects (11.4) | Action 11.4. Promote community-based conservation projects in which sustainable use of natural resources can be demonstrated (e.g. the UNDP/GEF-funded project "Maintaining Biodiversity in Pakistan with Rural Community Development."). | Community Based Conservation is mainstreamed now and is being successfully implemented. ✓ |
| | Strengthen sectoral coordination (13.1) | Action 13.1. Create inter-sectoral steering committees at both the federal and provincial levels to oversee the implementation of the BAP. | Not done ✗ |
| **Incentive Measures** | Identify "perverse" incentives (15.1) | • Action 15.1. Carry out a comprehensive review of GoP programmes and policies, to identify "perverse" incentives and suggest measures to ameliorate their impacts. | Not done ✗ |
| **Research and Training** | Identify gaps and priorities for new research (16.2) | Action 16.2. Identify gaps and initiate new research programmes in priority areas. | Completed. ✓ |

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| | Assess biodiversity-related training needs (17.1) | Action 17.1. Assess current capacity and the biodiversity-related training needs of natural resource managers, conservation professionals and other concerned staff, and the extent to which these are currently being fulfilled. | Not done  |
| | Create diploma course for PA Managers (17.5) | Action 17.5. Create at least one vocational diploma-level course to train protected area managers. | Not done  |
| **Education/ Awareness** | Develop public education/ awareness strategy (18.1) | Action 18.1. Develop a strategy on biodiversity conservation and sustainable use within the framework of the environmental education and communication programmes of the NCS and provincial conservation strategies, and incorporate the specific actions described in the following sections. | Not done  |
| | Encourage the role of media (20.3) | Action 20.3. Encourage the role of media and in particular of radio, through the establishment of information clearinghouses. | Some TV channels and leading newspapers are providing good coverage to conservation matters. |
| **Environmental Impact Assessment** | Finalize rules and guidelines for PEPA 1997 (21.1) | Action 21.1. Finalize detailed rules, regulations and guidelines for the implementation of IEE/EIA under the 1997 Act, to include a checklist of processes and activities which have or are likely to have significant adverse impacts on biodiversity (e.g., major power and road-building projects). | All guidelines have a strong biodiversity component because of the potential impacts on biodiversity of the mega initiatives.  |
| **Access Issues** | Collect baseline data (22.1) | Action 22.1. Collate baseline data relating to genetic resources and on current practices of access to such resources for academic and commercial purposes. | Not done.  |
| | Prepare existing legal/institutional profile (22.2) | Action 22.2. Prepare an existing legal and institutional profile relating to the import, export, and use of genetic resources and traditional knowledge. | ABS law drafted, but not yet enacted.  |
| | Develop action plan (22.4) | Action 22.4. Develop an action plan for implementation of priority actions through assigning responsibilities and identifying institutional development needs and designate an appropriate authority to oversee and implement the policy and relevant laws. | Not done  |
| **Exchange of Information** | Establish a national clearinghouse on biodiversity information (23.1) | Action 23.1. Establish a national information clearinghouse on biodiversity. | CHM established.  |

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|---|---|---|---|
| **Financial Resources** | Establish task force to generate funding (24.3) | Action 24.3. Establish a task force to look into possible avenues of developing sustainable revenues to support biodiversity. | Not established ✗ |
| | Strengthen capacity to develop GEF proposals (25.4) | Action 25.4. Strengthen national capacity to submit successful proposals to the GEF, through training in project development and proposal preparation (using the GEF format). | Not done ✗ |
| | Strengthen Pakistan's "voice" at CBD-COP (25.5) | Action 25.5. Take steps to strengthen Pakistan's "voice" at the CBD Conferences of Parties. | A Biodiversity Directorate was established but lacks capacity for coordination and implementation of BSAP. ✓ |

| **BAP Component** | **Short Term Actions (within 5 years)** | **Specific Actions** | **Implementation Status** |
|---|---|---|---|
| **Policy/ Planning** | Promote coordination between institutions (1.3) | Action 1.3. Institutionalize the biodiversity strategy process initiated by the current BAP, at both the national, provincial and local levels. | Not done. ✗ |
| | Integrate biodiversity into sectoral plans (1.4) and conservation strategies (1.5) | Action 1.4. Integrate biodiversity considerations into the Perspective Plans, Five Year Plans and Annual Development Programmes (ADPs), and into relevant sectoral plans, particularly those for wildlife, forestry, fisheries and agriculture. | Not done ✗ |
| | | Action 1.5. Promote the preparation of provincial conservation strategies with strong elements of biodiversity conservation and cross-reference to Five Year Plans and provincial ADPs. | Conservation strategies prepared, but not linked to provincial development plans. ✓ |
| **Legislation** | Review existing legislation (2.2; 2.4) | Action 2.2. Review all relevant existing legislation in Pakistan against the obligations under the CBD and other biodiversity-related conventions to determine the need for amendments and/or new legislation to meet these obligations. | KP and Punjab have revised forest laws. Forest Act under revision in Balochistan. Wildlife laws are under revision in all provinces. ✓ |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Develop access legislation (2.7) | Action 2.4. Update and rationalize legislation on endangered and exploited flora and fauna in Pakistan, in line with the CBD and according to the specific requirements of Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), and other relevant conventions mentioned in Annexure 2 of this document. Increase penalties for violations and introduce a system of rewards for compliance. | CITES legislation made. Model ABS legislation drafted.  |
| | | Action 2.7. Develop access legislation as a matter of priority to comply with Article 15 (genetic resources), Article 16 (technology) and Article 19 (handling of biotechnology and distribution of its benefits) (see Section 4.11). | Biosafety Rules 2005 enacted. Model ABS Legislation drafted.  |
| | Develop biosafety regulations (2.8) | Action 2.8. Develop guidelines/ regulatory measures with regard to biosafety, relating to the development, use, transport and import of Living Modified Organisms. | Not done  |
| | Enhance enforcement capacity (3.1) | Action 3.1. Improve the effectiveness of existing legal mechanisms by creating greater awareness of conservation regulations and enhancing the capacity of law enforcement agencies (including the departments of wildlife, police, customs and quarantine). This should include the provision of training to relevant officers in identifying the species listed in CITES Appendices I and II. | Capacities of Wildlife Departments strengthened. No action taken to improve capacity of other departments.  |
| **Identification /Monitoring** | Create National Red Lists (4.3) | Action 4.3. Create a National Red Data List of threatened flora and fauna. | Red data list for mammals drafted  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Establish computerized databases (4.5) | Action 4.5. Store and catalogue information in computerized databases, to be maintained by "custodian" agencies. | Computerized database established at Pakistan Museum of Natural History.  |
| | Produce "State of the Environment" report (5.2) | Action 5.2. Provide periodic assessments (e.g. through a "State of the Environment" report) of key elements of biodiversity and indicators of progress/failure, including resources allocated by government towards biodiversity conservation. | Not done  |
| ***In-Situ* Conservation** | Develop comprehensive PA legislation (6.1) | Action 6.1. Ensure that legislation for protected areas includes:<br>-- objective criteria for the selection of protected areas<br>-- an updated and rationalized system of protected area categories with reference to the international categorization system developed by IUCN, and provide for the establishment of private and community protected areas;<br>-- provisions for collaborative management systems involving government authorities, NGOs and local communities and<br>-- Mandatory preparation and implementation of iterative management plans. | A comprehensive Protected Areas legislation not developed. However, some provisions are being added in the wildlife laws under revision in the provinces.  |
| | Prepare PA system plan (6.2) | Action 6.2. Carry out a thorough protected areas system review to identify existing gaps. On the basis of the review, prepare a protected areas system plan for Pakistan. | PA system review completed in 2000. PA system plan not prepared.  |
| | Enhance PA management (6.4) | Action 6.4. Enhance the management of existing protected areas. | 7 PAs under improved management.  |
| | Develop regional conservation programs (7.1) | Action 7.1. Develop regional conservation programmes to integrate conservation activities and protected area management with regional land use planning. | Not done  |
| | Enhance CBO/NGO capacity for conservation (7.3) | Action 7.3. Enhance the capacity of local communities and NGOs to conserve, manage, and sustainably use biodiversity. | Community Based Conservation has been mainstreamed.  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Promote buffer zone management (7.4; 7.5) | Action 7.4. Ensure that protected areas and adjacent buffer zones are treated as a single planning unit. Of particular importance in this regard, is to support implementation of an Integrated Coastal Zone Management (ICZM) plan for the entire coastline of Pakistan. | Some buffer zone activities carried out in 3 PAs under GEF PAM Project.<br><br>Coastal Zone development authorities established in Sindh and Balochistan.  |
| | | • Action 7.5. Ensure that activities in natural areas outside protected areas are governed by management plans that pay adequate attention to the conservation of biodiversity; identify the most appropriate management authority for buffer zone areas. | Not done  |
| | Share biodiversity information with planners (7.6) and defence agencies (7.7) | Action 7.6. Ensure that development personnel, land-use planners, aid agencies and the national and provincial planning authorities have access to information about biodiversity. This should include information about the location of biological "hot spots" and rare and endangered species. | Not done.  |
| | | Action 7.7. Promote the conservation of biodiversity on military bases and other land owned or managed by the defence agencies. | Not done  |
| ***Ex-Situ* Conservation** | Develop national policy (8.1) | Action 8.1. Develop a national policy on ex-situ conservation. | No national policy formulated, however, many provinces now have made changes in rules to promote *ex-situ* conservation.  |
| | Strengthen capacity and scope (8.5) | Action 8.5. Strengthen the capacity and scope of *ex-situ* conservation programmes through the provision of additional funding, equipment, and training. | Not done  |
| | Promote integration among institutions (8.6) | Action 8.6. Promote integration of *ex-situ* conservation efforts among institutions. | Network of botanical gardens in academic institutions established.  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| **Sustainable Use** | Formulate policies (9.1) | Action 9.1. With the adoption of the BAP, formulate policies in different resource sectors which would promote the sustainable use of biological resources. | Not done  |
| | Review existing laws (9.2; 9.3; 11.1) | Action 9.2. Review, and where necessary, revise existing laws to ensure that an effective legal framework is in place which promotes sustainable use; establishes clear rules on jurisdiction and responsibilities among agencies and permitted users and clarifies rights of ownership to biological resources. | Not done  |
| | | Action 9.3. Introduce legal measures requiring the development of management plans for harvested species. | Management plans for sport hunting mandatory.  |
| | | Action 11.1. Review and revise the laws relating to ownership and access to natural resources (e.g., tenure rights to fuel wood, fodder, wildlife, and trees), to recognize community property rights and traditional natural resource management systems. | Not done.  |
| | Reduce incidental take of(10.4) | Action 10.4. Take measures to reduce the incidental take of non-target species (e.g., the incidental take of marine turtles in the commercial shrimp fishery). | Partially done by Marine Fisheries Department including introduction of Turtle Excluding Devices.  |
| | • Evaluate traditional management systems (11.2; 11.3) | • Action 11.2. Evaluate traditional systems of harvesting biological resources (terrestrial and marine) and disseminate information on practices which promote the sustainable harvesting of these resources. | Not done  |
| | | Action 11.3. Use traditional land tenure arrangements as a basis for planning and implementing conservation projects that promote sustainable use of biological resources. | Being accomplished in Community Conservation Areas.  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| **Incentive Measures** | Introduce direct/indirect incentives (14.1; 14.2) | Action 14.1. Introduce a system of direct incentives to promote the conservation and sustainable use of biodiversity that could include:<br>-- the provision of subsidies to encourage farmers to retain local cultivars and crop varieties, and to adopt practices such as Integrated Pest Management, agro-forestry, and multi-species cropping;<br>-- the provision of subsidies to encourage land owners to manage their properties in ways which are sensitive to biodiversity, or to refrain from changing existing land-uses;<br>-- the provision of grants for the protection of threatened species or habitats and the restoration of degraded lands;<br>-- the development of programmes to ensure that local communities receive direct benefits from biodiversity, e.g., through sustainable use activities;<br>-- incentives to encourage ex-situ propagation/breeding programmes for traded species of wild plants and animals, in order to reduce the strain on wild populations and<br>-- provision of incentives for staff (particularly field staff) working in institutions dealing with biodiversity. Possibilities include: upgrading employees to regular functional staff; the provision of extra training opportunities; and public recognition for outstanding service. | Not done  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | | Action 14.2. Introduce a system of **indirect incentives** to promote the conservation and sustainable utilization of biodiversity that could include:<br>-- **fiscal incentive measures,** such as tax exemptions or deductions for the conservation of particular habitats or species; tax reductions for the import of equipment used in conservation programmes and tax deductions for donations to conservation NGOs.<br>-- **service oriented incentives,** designed to link community development programmes with the conservation of biodiversity. For example, communities living adjacent to protected areas could be accorded priority for public awareness programmes and technical assistance in agriculture, forestry, and other fields.<br>-- **social incentive measures,** designed to improve quality of life. These include measures such as clarification of land tenure and the creation of new institutions to manage biodiversity. | Not done  |
| | Introduce disincentives (14.3 | Action 14.3. Introduce a system of **disincentives** to discourage unsustainable utilization and practices which deplete biodiversity. These could include:<br>-- increasing the size of fines for the violation of conservation laws;<br>-- revising the tax schedule to penalize unwanted land-use practices;<br>-- using fiscal disincentives (e.g., pollution and effluent charges) for activities which are damaging to biodiversity. This could also include the use of a "polluter pays" policy, requiring developers to take measures to mitigate the environmental damage caused by their activities; and<br>-- promoting and strengthening traditional customs and practices which serve as disincentives to unsustainable use. | Not done  |
| **Research and Training** | Strengthen current biodiversity research (16.1) | Action 16.1. Evaluate, institutionalize, and strengthen current programmes of research on native biodiversity. | Not done  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Design and implement in-service training (17.2) | Action 17.2. Design and implement in-service training courses to address immediate gaps and priority requirements. | Not done  |
| | Design opportunities for international linkages (17.3) | Action 17.3. Enhance existing training programmes in natural resource management, through the provision of funding, staff, and equipment. Explore opportunities for "twinning arrangements" with institutions in other countries (universities, botanical gardens, national park authorities, etc.). | Not done  |
| | Develop degree programs in biodiversity and conservation biology (17.4) | Action 17.4. Develop at least one university degree program in biodiversity and conservation biology particularity as it relates to community-based management of natural resources. Promote the integration of biodiversity themes into other, tertiary-level courses and programmes. | Some universities have included courses in biodiversity in their curriculum.  |
| | Initiate training programs with "umbrella" NGOs (17.7) | Action 17.7. Strengthen the capabilities of NGOs and community institutions to play an effective role in the conservation and management of biodiversity; in particular, initiate training programmes with "umbrella NGOs" which have large networks of Community-Based Organizations and VOs. | Not done  |
| **Education/ Awareness** | Develop relevant course material (19.3) | Action 19.3. Develop course materials relevant to the conservation and sustainable use of biodiversity. In particular: revise school textbooks according to the proposed curricula revisions; and develop course materials relevant to local curricula, and co-curricular activities. | Not done  |
| | Promote informal education programs (20.1), including focused campaigns (20.2) and traditional channels | Action 20.1. Develop and promote a comprehensive informal biodiversity education program, tailored to the particular key audiences and ecological conditions of Pakistan. | Not done  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | (20.4) | Action 20.2. Develop more focused campaigns designed with a particular goal in mind, such as working with a local community adjacent to a protected area to foster local knowledge relating to the protected area, and promote understanding of the need for the protected area. | Not done  |
| | | Action 20.4. Make better use of traditional channels; identify key audiences and the most effective traditional channels for each audience. These might include customary community institutions and meeting places. | Not done  |
| | Develop interpretive facilities (20.8) | Action 20.8. Develop biodiversity interpretive facilities, including field centers at selected protected areas and interpretive programmes in all botanical gardens, zoos, herbaria, gene banks, natural history museums etc. | WWF have established Information Centers in 10 ecological zones.  |
| | Develop locally relevant resource materials (20.9), including field guides (20.10) | Action 20.9. Develop locally relevant resource materials on the conservation and sustainable use of biodiversity for the use of agencies developing informal education programmes. | Not done  |
| | | Action 20.10. Develop affordable, popular, accessible, and comprehensive field guides to the birds, animals and flora of Pakistan. | Not done  |
| **Environmental Impact Assessment** | Strengthen capacity of EPA staff (21.2) | Action 21.2. Strengthen institutional capacity to evaluate the environmental impacts of development activities, especially in relation to biodiversity. Particular emphasis should be placed on training Environmental Protection Agency and Federal/Provincial Planning and Development Department's staff in biodiversity issues and ensuring EIA is also referred to relevant natural resource management institutions for review. | Not done  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Encourage effective public participation in EIA process (21.3) | Action 21.3. Encourage effective public participation in the EIA process. This should include public review of EIA reports and access to information on planned development projects. Data should be made freely available to local communities and NGOs concerning planned development projects impacting on biotic resources in their areas, so that they may play an active and informed role in their own development. | This is being accomplished through notices in the local newspapers and flyers distributed o local communities.  |
| | Expand the SEA concept (21.4) | Action 21.4. Expand the concept of Strategic Environment Assessment (SEA) to address the environmental impacts of programmes and policies (e.g., the National Drainage Programme; agricultural policies which promote the production of mono-cultural export crops). | SEA is in place for large scale development projects.  |
| | Review NEQS for specific ecosystems (21.5) | Action 21.5. Review the National Environmental Quality Standards (NEQS) with due consideration to potential impacts on specific ecosystems (e.g., the effects of sewage discharge and industrial effluents on aquatic ecosystems). | NEQs being drafted.  |
| **Access Issues** | Formulate a national policy (22.3) | Action 22.3. Formulate a national policy and strategy on genetic resources and access issues through the participation of stakeholders (government agencies, industry, scientific community, ex-situ conservation facilities, relevant NGOs, CBOs and private individuals). | Not done  |
| | Develop legislation (22.5) based on a regional approach (22.6) | • Action 22.5. Develop legislation in support of the national policy.<br>22.5.1 This revised legal framework should:<br>-- provide explicit recognition of Pakistan's sovereign right over its biological resources, including genetic resources;<br>-- effectively control and regulate access to genetic resources, including bio prospecting, the import and export of all genetic resources (including micro-organisms and living modified organisms), and the use of biotechnology in developing genetically engineered organisms;<br>-- provide for the recognition and protection of indigenous knowledge | Draft Pakistan Access and Benefit Sharing Act 2012  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | | (through the use of petty patents or similar mechanisms), irrespective of time limitations;<br>-- establish a clear system for the fair and equitable<br>distribution of benefits derived from the use of genetic resources;<br>-- formulate legislation for release of Living Modified Organisms (LMOs) into the environment which includes, proper Environment Impact Assessment for biosafety of LMOs and living organisms imported from other ecological zones; | |
| | | Action 22.6. In developing the legal framework described above, assess the desirability of harmonizing new access legislation with similar legislation being developed in other countries in south and south-east Asia (e.g., Malaysia), in order to create a common, regional approach to these issues. |  |
| | Harmonize regional policies (22.7) | Action 22.7. Countries having similar ecological zones e.g., South Asian Association for Regional Cooperation (SAARC countries) should harmonize policy for import, export and use of genetic resources from the region as a whole. | Not done  |
| **Exchange of Information** | Exchange information with outside institutions (23.2) | Action 23.2. Establish contact with institutions outside Pakistan (e.g., the British Museum of Natural History) to obtain information about those collections of Pakistani origin which are currently being held abroad. | Not done  |
| | Enhance institutional capacity to manage information (23.3) | Action 23.3. Enhance the capacity of relevant national and provincial institutions to collect, store, analyze and supply information on biodiversity, through the provision of funding, equipment, staff and training. | Not done  |
| **Financial Resources** | Re-align expenditures with BAP priorities (24.2) | Action 24.2. Re-assess existing expenditure on biodiversity-related activities against the priorities identified in this Biodiversity Action Plan; re-align expenditure to address the most urgent and important priorities as required. | Not done  |

| BAP Component | Short Term Actions (within 5 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Enhance donor interest (25.2) and participation (25.1; 25.3) | Action 25.2. Establish a database of agency/donor, development activities and locations to identify areas of possible donor interest. | Not done |
| | | Action 25.1. Create an informal working group of aid agencies and donors on biodiversity conservation and management in Pakistan. | Not done |
| | | Action 25.3. Coordinate donor activities to maximize conservation efforts and resources. Invite donor agencies to assist with the priority conservation activities in regions where they already have development programmes. | Not done |

| BAP Component | Long Term Actions (within 10 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| **Legislation** | Amend Constitution (2.1) | Action 2.1. Review the 1973 Constitution to make the conservation and sustainable use of biological diversity the concern of the state and the citizen. | Not done |
| | Comply with International Conventions (3.4) | Action 3.4. Take all necessary measures to fulfill the commitment of the agreements already signed under related International Conventions. | Partially done. |
| **Identification/ Monitoring** | Institutionalize resource monitoring (5.1) | Action 5.1. Develop and institutionalize regular resource monitoring by the agencies responsible for the conservation and sustainable use of natural resources in Pakistan. Particular attention should be accorded to monitoring the status of protected areas and the components of biodiversity identified in Annex 1 of the Convention. Monitoring should also be carried out with the active participation of local communities. | Not done |
| ***In-Situ* Conservation** | Expand PA system (6.3) | Action 6.3. Expand Pakistan's protected area system to improve its representativeness, viability, and connectivity. | PA network expanded, but little or no connectivity, and only a few PA under management. |
| | Restore degraded ecosystems (6.5) | Action 6.5. Restore degraded ecosystems within protected areas and in adjacent lands and corridors. | Degraded ecosystems in PAs under management are improving. |

| BAP Component | Long Term Actions (within 10 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | | | ✓ |
| | Control exotic invasive alien species (6.6) | Action 6.6. Take measures to control invasive alien species of flora and fauna, and to prevent further introductions. | Not done. ✗ |
| | Modify destructive resource practices (7.2) | Action 7.2. Adopt agricultural, forestry, and fishery practices that will enhance the conservation of biodiversity. | No progress. ✗ |
| **Sustainable Use** | Enhance capacity of monitoring (10.1) | Action 10.1. Enhance capacity of government agencies, research institutions, NGOs, and local communities to determine and monitor harvest of biological resources. | Capacity exists among government institutions, and some local communities. ✓ |
| | Require management plans as a basis for SU (10.3) | Action 10.3. Ensure that biological resources are harvested according to scientifically-sound management plans. | Except for trophy hunting, no mechanism in place. ≈ |
| | Develop methodologies for valuation (12.1) | Action 12.1. Develop, document, and adopt standardized methodologies for economic valuation of biodiversity, tailored according to the requirement of individual decision-making agencies. | Not accomplished ✗ |
| | Initiate "green" accounting (12.2) | Action 12.2. Initiate measures to "green" the system of national accounts. | Not accomplished ✗ |
| **Research and Training** | Legislate Pakistani involvement in research (16.3) | Action 16.3. Draft, enact, and implement legally binding regulations to ensure that research on any component of indigenous biodiversity carried out by foreigners is only done on the basis of an agreement with a local institution and in close collaboration with Pakistani scientists, and that the outcome of such research, including information and type specimen that are generated, is made available to Pakistani scientists and institutions. Access to the genetic material should be free of charge for the country of origin. | Addressed in draft ABs Act. ✓ |
| | Promote post-graduate specialization (17.6) | Action 17.6. Promote, through grants and other means, post-graduate specialization in biodiversity-related fields, e.g. taxonomy. | Not done. ✗ |

| BAP Component | Long Term Actions (within 10 years) | Specific Actions | Implementation Status |
|---|---|---|---|
| | Integrate biodiversity concerns in other curricula (17.8) | Action 17.8. Integrate biodiversity concerns into the training curricula of rural development and extension staff, particularly in the fields of agriculture, forestry, and fisheries. | Not done  |
| **Education/ Awareness** | Incorporate biodiversity emphasis in national and local curricula (19.1; 19.2) | Action 19.1. Develop national curricula which emphasize biodiversity's importance for local and national welfare, alongside its contributions to the health of ecosystems; and tie ecological, economic, and social themes together. | Modest achievement through inclusion of some chapters in school text books.  |
| | | Action 19.2. As far as possible, develop local curricula directly relevant to students' local ecological, cultural and economic environment, to supplement the national curricula, and develop co-curricular activities on biodiversity issues of immediate local concern; in particular, develop pilot local curricula for schools in and around protected areas or areas of particular importance for biodiversity. | WWF has introduced Spell-a-thon in some schools from grade 1-9, but urban schools are focused more rather than schools around PAs.  |
| | Encourage partnerships in curricula development (19.4) | Action 19.4. Encourage public-private partnerships in curricula development, the development of relevant co and extra-curricular activities, and the development of course materials in the partnerships of educational and environmental authorities, the government and the NGOs, public and private schools, with international collaboration. | School curriculum development authorities supported to develop curricula on biodiversity.  |
| | Document local knowledge (20.5) | Action 20.5. Document the local knowledge, take in stride the cultural, and religious basis of biodiversity conservation and sustainable use in Pakistan. | IUCN Pakistan has prepared books on religion and conservation.  |
| | Encourage growth of membership groups in biodiversity conservation (20.8) | Action 20.8. Develop biodiversity interpretive facilities, including field centers, at selected protected areas and interpretive programmes in all botanical gardens, zoos, herbaria, gene banks, natural history museums, etc. | Done in 3 PAs under GEF PAMP.  |
| ***Financial Resources*** | Re-assess national spending priorities (24.1) | Action 24.1. Re-assess national spending priorities, and consider financial re-allocations from those sectors which currently receive a disproportionate share of the national budget. | Not done  |

## 2. 2. Mainstreaming of Biodiversity

There is neither a national biodiversity policy nor legal framework for mainstreaming biodiversity in the planning and development process. A national forest, and a wetland policy has been drafted but have not been approved yet. One of the four provinces, Khyber Pakhtunkhwa (KP), has approved a forest policy that includes provisions for conservation of forest biodiversity. In addition, biodiversity has been included in the curricula of many educational institutes. As a result, there is an increasing awareness about biodiversity and for need to conserve it, and use it sustainably. The main drivers of this change have been the large and medium scale projects funded by Global Environment Facility (GEF). The GEF Small Grants Program and celebration of international days like Biodiversity, Environment, Forests, Wetlands, Water, and Earth Hour etc. have played a vital role in creating awareness about the importance of biodiversity.

## 2. 3. Biodiversity Targets

Other than the BAP, Pakistan has not fixed any national or regional biodiversity targets. This is primarily due to weak institutional arrangements for implementation of CBD at the national level and almost complete absence of any institutional arrangements at the provincial and regional level. There are no designated focal points for CBD implementation at the provincial level. The national authority for implementation of CBD has already initiated process for revision of BSAP and is working with the provinces and other regions to designate focal points for CBD, and to constitute provincial and regional BWGs to steer the process for preparation of regional BSAPs, and improve coordination for implementation of CBD. It is hoped that the process will ultimately lead to setting national and provincial biodiversity targets.

## 2. 4. Updated National Biodiversity Strategy and Action Plan

The BAP of 2000 has served a useful purpose for mainstreaming biodiversity and implementation of the CBD. However, since its formulation, the CBD COP has formulated a number of thematic and cross cutting programmes of work and provided guidance through various other decisions. Currently COP is focusing on implementation of strategic Plan and Aichi Biodiversity Targets 2010-2020. There is a growing realization among all stakeholders that implementation of the strategic plan including Aichi Biodiversity targets and action on other CBD programmes of work can be done best through regional BSAPs. The process of updating national and regional BSAPs has been initiated and is likely to be completed by the end of 2014.

## 2.5. Implementation of the Convention since the Fourth Report

**Legislation and Policy**

The relevant laws enacted and policies formulated are as follows:

- CITES Act 2012
- National Forest Policy 2009 (draft)
- National Wetlands Policy 2012 (draft)
- National Rangelands Policy (draft)
- Rangelands Policies under preparation in Khyber Pakhtunkhwa and Gilgit-Baltistan Region.
- Pakistan Access and Benefit Sharing Act 2012 (Draft).

The country lacks a comprehensive legislation and policy for Biodiversity and Protected Areas Management. The draft of the policies remains paper work and no serious effort is made for action. It is therefore important that steps are taken for the approval, effective implementation and monitoring of the drafted policies.

**Institutional and Cooperative Mechanism**

The institutional mechanism for implementation of CBD and other related conventions is weak and fragmented at the national level and non-existent at the provincial and regional level. There is little or no cooperation mechanism or networking among relevant institutions at national and regional level. These mechanisms will

develop and flourish only when the human resource and financial capacity of the National Biodiversity Directorate is strengthened.

**Funding**

The inadequate financial resources have been a serious constraint for the implementation of the CBD strategic Plan and Aichi Biodiversity Targets. At the national level, financial allocation for conservation of biodiversity and other natural resources is the lowest priority. Bilateral and multilateral financial assistance, especially from GEF have played a major role in the modest progress towards achieving global biodiversity targets.

# Part III

# AICHI BIODIVERSITY TARGETS AND THE MILLENNIUM DEVELOPMENT GOALS

## 3. 1. Progress towards the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets

The implementation of the Strategic Plan and action on Aichi Biodiversity did not receive serious attention due to weak institutional capacity of the national authority for implementation of the CBD. The country has not so far fixed any targets; however, the plans and activities of many sectors have contributed towards the strategic objectives and made contributions towards implementation of the Aichi Biodiversity Targets. The following analysis of progress is based on written and verbal input provided by relevant stakeholders and key resource persons. The indicators mentioned are not officially adopted ones but suggested by the stakeholders. The "traffic-light" scheme suggested in the resource manual of 5th NR has been used to illustrate an overall assessment of progress.

Key to indicator assessment of change over time:

= Improving

= little or no overall change

= Deteriorating

= insufficient or no comparable data

**Table 10.** Progress on the implementation of the Strategic Plan and Aichi Biodiversity Targets.

| Global targets | National contribution to global target | Relevant indicator and associated measures | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|
| | | | Since 2009 | Long Term | | |
| Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society. | | | | | | |

[1]The assessment measures the change since the Fourth National Report prepared in the year 2009. Long term assessment is based on the trend since 2009. These assessments are purely subjective and not based on surveys or research.

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| **Target 1:** By 2020, at the latest, people are aware of the value of biodiversity and the steps they can take to conserve and use it sustainably. | Pakistan regularly celebrates international days: Biodiversity, Forests, Water, Environment, etc | Not defined | Not defined | ✓ | ✓ | Many universities have included biodiversity in curricula. Many schools have extra-curricular activities on biodiversity. Programs in the media, and articles increasing the awareness in biodiversity. | None |
| **Target 2:** By 2020, at the latest, biodiversity values have been integrated into the national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems. | No significant contribution | Sectors | Policies | ≈ | ••• | No change | None |
| **Target 3:** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the | The subsidy on electricity for farm tube wells has been withdrawn, which was a major cause of ground water depletion. | Policy Measures | Sectors | ≈ | ≈ | | |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions. | Positive incentives to community for conservation of wildlife for sport hunting have been a big success and number of such sites is growing | Community Conserva-tion Areas (CCA). Amount of money the Community Based Organizations are getting out of Trophy Hunting | Number of sites and area | ✓ | ✓ | 114 CCAs covering 1,059,668 ha | There are no national targets |
| **Target 4:** By 2020, at the latest, Governments, businesses and other stakeholders at all levels have taken steps to achieve, or have implemented plans for sustainable production and consumption of biodiversity, and have kept the impacts of the use of natural resources well within safe ecological limits. | There is an interest among all stakeholders for sustainable production and consumption, but very little progress | Acts and policy measures | Sectors | ≈ | ≈ | A number of projects have been launched for sustainable consumption of natural resources such as water management project, micro irrigation system, demonstration and construction of small dams. | No national targets |
| Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use | | | | | | | |
| Target 5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought | According to FAO estimates Forest cover in Pakistan has declined from 4 to 2%. However | Natural Forest Cover | Area | ✗ | ✗ | FAO reports and local independent studies report significant loss in forest cover | No national targets |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| close to zero, and degradation and fragmentation is significantly reduced. | government reports that forest cover including farm trees equal 5.01% | Farm Forestry | Trees per ha | ✓ | ✓ | Increase in timber and fire wood production from farm lands | No national targets |
| Target 6. By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits | There is no major issue of aquatic plants. Invertebrates and fish stocks are harvested legally, but sustainable harvest and ecosystem based approaches not in place. | Types of invertebrate and fish stock harvested sustainably | Number of sites | ≈ | ≈ | There are no initiatives at present | No national targets |
| | Restocking of natural waters with indigenous species is underway | Species being restocked | Kind and number of fish seed released | ✓ | ✓ | Stocking is being done in some water bodies, A national park has been declared to protect Mahaseer species in AJK | No national targets |
| Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity. | Agriculture lands primarily managed for commercial or subsistence agriculture without any consideration for the conservation of | Farms and orchards | Number and area | ≈ | ✓ | WWF - Pakistan and IKEA have been collaborating under "Pakistan Sustainable Cotton Initiatives (PSCI)" since 2005 for the development and | No national targets |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| | biodiversity | | | | | promotion of Site-specific Better Management Practices (BMPs). More than 50,000 farmers participated in the program to grow better cotton over an area of 200,000 ha during 2011. There is 37.5 % reduction in water use, 47 % in pesticide use and around 41% in fertilisers achieving 1:2.3 cost-benefit ratio compared with 1:1.1 by non-BMP farmers. Many farmers are slowly adopting micro irrigation systems, planting of low delta crops and change of cropping pattern which would contribute to biodiversity conservation. | |
| | Aquaculture mainly practiced in fish ponds with no threat to biodiversity | Farms | Number and area |  |  | Increase in aqua culture. | No national targets. |
| | Forests are generally managed in a sustainable manner but gradually being | Natural forests | Area under sustain-able |  |  | No data available | No national targets. |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| | degraded due to anthropogenic pressure | | manage-ment | | | | |
| Target 8. By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity. | Data not available | Affluent from industries | Quantity | ••• | ••• | No data available | No national targets |
| Target 9. By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment. | No contribution | Not defined | Not defined | ≈ | ≈ | No change | No national targets |
| Target 10. By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning. | No significant contribution | Not defined | No change | ≈ | ≈ | No change | No national target |
| Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity | | | | | | | |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| Target 11. By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effective and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes. | The protected areas included in the national list cover 12% of the area of the country. However, not all protected areas meet IUCN definition of the protected areas. | Protected Areas | Area of Protected Sites | ✓ | ✓ | Seven new protected areas have been established | The target is to have 17% area covered by protected areas. |
| | | | | ✓ | ✓ | | |
| | There is no marine protected area in Pakistan | Protected Area | Area of Protected sites | ≈ | ≈ | No marine protected area so far. | No national targets |
| Target 12. By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those more in decline, has been improved and sustained. | The number of fauna species in CITES Appendix I Appendix II Appendix III | Conservation Status | Species | ≈ | ≈ | No data available on current status | No national targets |
| | The number of flora species in CITES Appendix I Appendix II Appendix III | Conservation Status | Species | ≈ | ≈ | No data available on current status | No national targets |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| Target 13. By 2020, the genetic diversity of cultivated plants, farmed and domesticated animals and of their wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity. | The gene pool of crops is being maintained and updated.<br><br>Selected indigenous breed of livestock being maintained. | Crops<br><br>Breeds | Number<br><br>Number | ✓ | ✓ | Quantitative data not available | No national targets |
| Strategic Goal D: Expand the benefits to all from biodiversity and ecosystem services. | | | | | | | |
| Target 14. By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and | There is no national program to restore and safeguard ecosystems that provide essential services and | Ecosystems Conserved | Area of sites | ✗ | ✗ | No attention is being paid to these ecosystems and their condition is deteriorating due to increasing human population | No national targets |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable. | contribute to the health, livelihoods and well-being of local communities and vulnerable poor. | Ecosystems Restored | Area of sites | ⊗ | ⊗ | No attention is being paid to these ecosystems and their condition is deteriorating due to increasing human population | No national targets |
| Target 15. By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including the restoration of at least 15 per cent of degraded ecosystems, thereby contributing to the mitigation of climate change adaptation and combating desertification. | Pakistan is in the process of building capacity for REDD+. So far no major efforts have been made to enhance carbon stock through conservation and restoration of natural forests | Carbon Stock Enhanced | Tons | ≈ | ≈ | There is greater awareness to enhance carbon stocks in forests and projects are in pipe for REDD+ readiness | National targets have not yet been set. |
| | Sustainable land management | Practice | Area | ✓ | ✓ | GEF Pilot project completed. Full scale project approved. | No national targets. |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| Target 16. By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is operational and in force, consistent with national legislation. | Pakistan has not yet signed the Nagoya Protocol | N/A | N/A | ≈ | ≈ | A proposal for signing Nagoya Protocol is under consideration of the government. | No target date for signing the protocol. |
| Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building. | | | | | | | |
| Target 17. By 2015 each Party has developed and adopted as a policy instrument; has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan. | A Biodiversity Action Plan was prepared in 2000. The process to prepare a revised BSAP has been initiated. | Revised BSAP | Approv-ed by the Govern-ment | ≈ | ✓ | The process for revision and updating of BSAP has commenced | Four provincial, two regional BSAPs |
| Target 18. By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, | The transhumance pastoralism is practiced by "Gujjars" in northern Pakistan, and some tribes in western Pakistan. Their traditional practices are well recognized. | Pastoral communities | Freedom to practice tradition al practice | ≈ | ≈ | The ecosystem degradation is increasing cost of living is creating economic hardships. Lands used by these pastoralists are owned or their ownership is claimed by local communities who take no action to improve the health of ecosystems. | No national targets. |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| and fully integrated and reflected in the implementation of the Convention by the effective participation of indigenous and local communities, at all relevant levels. | | | | | | | |
| Target 19. By 2020, the science base knowledge and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are widely shared transferred, and applied. | Successful demonstration of community conservation and Protected Area Management. | Sectors | Number of success stories | ≈ | ≈ | Community conservation initiatives on the increase. More PAs being brought under management | No national targets. |
| Target 20. By 2020, at the latest, the financial resources are mobilized for effective implementation of the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, | Progress on implementing strategic plan slow. | National Funds | Rupees allocate | ≈ | ✓ | There has been very little allocation of financial resources for the implementation of BAP | No national targets |
| | | Bilateral Assistance | Dollars | ≈ | ✓ | There has been very little allocation of financial resources for the implementation of BAP | No national targets |

| Global targets | National contribution to global target | Relevant indicator and associated measures | | Assessment of change for each target[1] | | Summary of change | Related national targets |
|---|---|---|---|---|---|---|---|
| | | | | Since 2009 | Long Term | | |
| increased substantially from the current levels. This target will be subject to changes contingent to resource needs assessments reported by the Parties | | Multilateral Funding | Dollars | ✓ | ✓ | GEF projects for mountain biodiversity and sustainable land management recently approved. | Sustainable harvest and marking of NTFPs – 3 sites. |
| | | | | | | A PIF has been approved for sustainable forest management. | Project formulation |
| | | | | | | World Bank grant of 3.6 million dollars approved for REDD+ | Capacity and institutional building for REDD+ |

## 3. 2. Contribution of actions to implement the Convention to achieve the relevant 2015 targets of the Millennium Development Goals

The Strategic Plan for Biodiversity 2011-2020 addressed the two relevant MDG targets, but since the implementation of the plan itself remained weak, enough attention was not paid to the MDGs in the country.
The relevant MDGs are:

Target 7.A: Integrate the principles of sustainable development into the country policies and programmes and reverse the loss of environmental resources

Target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss.

### Lessons learnt during the implementation of the Convention

**Successes**

The term biodiversity was a relatively new term to define the web of life and although the three objectives were not new concepts, implementation of the convention played a very useful role in popularizing the biodiversity values and importance of conservation, sustainable use and equitable sharing of benefits. Biodiversity is now included in the curriculum of many universities, the fade of introduction of exotics has faded away, safeguards are taken to prevent the spread of alien invasive species, there is greater participation of stakeholders in planning and decision making, and equitable sharing of benefits has increase community participation in conservation. Following is an overview of the major success in the country:

- Biodiversity is included in the curriculum of many universities
- Biodiversity considerations are included in the environmental impact assessment
- Scaling up of community participation in conservation
- Conservation status of many threatened and critically endangered species improved
- Protected Area coverage and number of PAs under effective management increased.

**Weaknesses**

The following are some of the activities that have not been successful due to:

- Inadequate measures for Institutional arrangements to implement the convention at national level
- Lack of Institutional arrangements for implementation of Convention in provinces and regions
- Inadequate policy and legal framework for implementation of the Convention
- Low prioritizing of Basic studies on value of biodiversity, its contributions to human well-being and national economy
- Neglect of the importance of studies of biodiversity status and trends on provincial level

**Recommendations**

The lessons learnt from the implementation of the Convention should form an integral part of the consultations with stakeholders during the updating of BSAP and needs identified to improve the implementation of Convention. The updated BSAP should include actions and strategies to improve Convention implementation.

## 3. 4. Examples of Actions taken to Implement Strategic Plan and Aichi Biodiversity Targets

### 3. 4. 1. Corporate Social Responsibility

WWF-Pakistan engaged with corporate sector, schools, government and other stakeholders at national level. The organization was able to establish strategic partnerships with its three-fold objective of raising awareness, corporate social responsibility and fundraising. Telenor Pakistan participated in a one-day training session on wilderness living in Dara Jangla, Islamabad. Levis employees, based in Lahore, participated in an interactive talk about recycling, especially that of textile produce, and were taken to Lahore Zoo Safari where they received survival training, planted trees and had an ECO Adventure session. United Bank limited, Crescent Steel, Allied Bank Limited and JS Investment participated in plantation drives and beach cleaning activities in Karachi. (Source: WWF Pakistan)

### 3. 4. 2. Green Office Certification

WWF's Green Office is an environmental service for offices– both large and small – in private companies, the public sector and other organizations. With its help, workplaces are able to reduce their burden on the environment, specifically carbon dioxide emissions, achieve savings and slow down climate change. The initiative commenced in Pakistan in 2009.

Office premises hold a key position in energy consumption and in sustainable solutions. Green Office motivates office staff to act in an environment friendly way with regard to everyday tasks, and improves environmental awareness and brings cost savings. WWF awards the Green Office designation to offices fulfilling the criteria of the Green Office program.

In December 2013, WWF-Pakistan conducted its second annual network meeting for the Green Office programme at Marriott Hotel Karachi. The theme for this year's event was about eco-efficient buildings and alternate energy sources. The purpose of the meeting was to bring existing companies together on one platform and to give them an insight into making energy efficient buildings, to improve the functionality of the employees within the buildings, to unveil smart energy devices and to share the practical implementation and feasibility of alternate energy in offices.

Unilever was honored with the gold award for the maximum reduction in percentage of its carbon footprint amongst the Green Network corporate while Engro Fertilizer and Corporation was presented with a silver award for showing consistent improvement in carbon reduction. Other companies certified include Packages Pvt Ltd, IBA Sukkur, Lotte Chemicals Pakistan, and Mobilink. **.** (Source: WWF Pakistan)

### 3. 4. 3. Environmental Journalism

WWF-Pakistan's work has expanded recently with intensive focus on internal and external communication strategies. WWF is reaching out to millions via fully redesigned official website along international guidelines. The specific focus on media and press relations has resulted in extended coverage of environmental initiatives and programmes in print and electronic media. It is a challenge to direct the media's attention to cover environmental issues, specifically in the context of Pakistan's political and economic climate. However, WWF's ongoing capacity building initiative for environmental and development journalism has empowered the professionals to pay close attention to environmental issues, and, in turn, realize that they are closely linked with issues such as policy, law, healthcare, sanitation and human rights.

A capacity building field visit to Karachi/Keti Bunder was organized for journalists from different print and electronic media organization. Journalists were briefed about environmental work in the region. The on-site analysis of the project helped the journalists realize the challenges Pakistan faces due to climate change, alongside efforts in action to combat it. Another capacity building trip was organized by WWF-Pakistan to Kotaddu alternative energy sources project sites, specifically the biogas plants project. Additionally, WWF has been actively engaging with local media to raise awareness about the critically endangered Gyps vultures by organizing informational tours to the Gyps Vulture Restoration Project site in Changa Manga Forest.

WWF-Pakistan continues its engagement with the print and electronic media on environmental issues, For this purpose the organization engaged with Geo, Samaa, PTV, ARY Network, Express News, CNBC Pakistan, Waqt News, Capital TV, Abb Tak News, Dawn News, KTN News, Aaj News, Wish Channel, City 42 and Hope TV which portrayed conservation news. Newspapers including Express Tribune, Dawn, Pakistan Observer, The News, The Nation, Pakistan Today, Business Recorder, The Daily Tiles, The Frontier Post, The Statesmen, Jang, Daily Express, Daily Pakistan, Daily Khabrain, Daily Jinnah, Daily Awami Awaz, Daily Kawish, Daily Ibrat, Daily Appeal, Daily Sobh, Daily Khabroon, Daily Nao Sijj, Daily Moomal and Nawa-e-Waqt published WWF-Pakistan sourced news. This engagement has increased extensively and from August 2013 to February 2014 close to 100 news stories referenced WWF-Pakistan or approximately one story every alternate day. . (Source: WWF Pakistan)

### 3. 4. 4. Environmental Awareness


WWF Pakistan launched in 1996 Spell-a-thon - a nationwide environmental spelling competition which reaches out every year to approximately 150,000 students through a total of 1,500 schools in more than 20 cities across Pakistan. It has become an integral part of the annual calendar of Green Schools across Pakistan. The objective of the competition is to raise awareness and understanding of pressing environmental issues, develop a sense of responsibility as well as love for nature while at the same time improving vocabulary and comprehension skills.

Students from grade 1 to grade 9 of the schools registered as part of the WWF-Pakistan Green School Programme participate in the competition. They are provided with booklets according to their comprehension levels on various themes, which are adapted each year. Then a written test of spellings is taken. Students help raise funds for WWF-Pakistan by getting pledges from parents and others to donate a certain amount of money for each word correctly spelled. Students are awarded gifts and prizes by WWF-Pakistan according to their performance in the spelling competition. An Urdu Spell-a-thon, for less privileged public school students, has also been introduced in recent years.

### 3. 4. 5. Species Assessment in three National Parks

**Khunjerab National Park**

Marco Polo's sheep (*Ovis ammon polii*)
Photo: Naeem Ashraf Raja

Khunjerab National Park was notified primarily to protect fast declining population of endangered Marco Polo sheeps (*Ovis ammon polii*) and other rare and unique wildlife species in its natural habitats. Bordering with Taxkorgan county of Xingjian, China, it is one of the most important alpine ecosystems, which harbors significant populations of globally important wildlife species, some being endemic and engendered in Karakorum Mountains. In 1980, during baseline survey only two Marco polo sheep were sighted in the park area but now the population has increased to 74 while in 2011 and 2012 the population was reported to be 68 and 42 individuals, respectively. Himalayan ibex population according to 2011, 2012 and 2013 census is 4130, 5102 and 5698 respectively while blue sheep population has increased tremendously showing figures of 2920, 3020 and 3310 in 2011, 2012 and 2013 respectively. Moreover, 5 brown bears were reportedly sighted in 2011 and 2012 while 3 in 2013. KNP is considered to support a significant population of snow leopards in Pakistan. Although a proper count of snow leopards is not available but it is believed to have 30 to 50 felines in total (Khan et al., 2012). . (Source: WWF Pakistan)

**Central Karakoram National Park (CKNP)**

It is located amidst the lofty peaks of Karakoram Mountains in Pakistan, spanning partly four of the seven districts of Gilgit-Baltistan. With K-2 (8611m), the world's second highest peak as its centre piece, the Park is characterized by the most rugged and glaciated landscapes on earth, offering tremendous potentials for tourism and mountain expeditions. WWF-Pakistan in collaboration with Gilgit-Baltistan Forestry Wildlife and Environment Department,

CKNP Directorate and Ev-K2-CNR has been monitoring biodiversity, primarily focusing on large mammalian fauna. A baseline of wild ungulates (Himalayan ibex and Astore markhor) has been established at all the major catchments of the Park, consisting a minimum number of 2,500-3,000 ibex in 21 valleys with 100-150 Astore Markhor in six valleys and 20-30 Ladakh Urial in one valley. Seasonal assessments conducted in selected valleys indicate overall increasing trends in numbers of wild ungulates, *e.g*., during winter 2011 the minimum number of Himalayan ibex observed in three valleys, *viz*. Basha, Thalay and Hisper was 20, 39, 430, respectively, which increased to 192, 229, 645, respectively during winter 2013. . (Source: WWF Pakistan)

**Deosai National Park**

Deosai is world's second highest plateau after Chan Tang in Tibet, China. Deosai plateau is known for its rich flora and fauna representative of the Karakoram-West. In 1993, the Park had only 20 Himalayan Brown Bears (HBB), which has increased to 62 sighted in 2009. As a whole, an increasing trend in population HBB has been observed in the Park in-spite of serious natural and anthropogenic pressures, uncontrolled grazing by transhumant pastoralists and local communities in this critical habitat is a major threat to the species. **.** (Source: WWF Pakistan)

### 3. 4. 6. Conservation Information Centers

WWF-Pakistan has established a total of 10 conservation and information centres in different ecological zones across the country to create awareness among the general public. The centres also aim to help researchers and tourists learn about surrounding flora and fauna. Through such initiatives the organization aims to ensure the sustainable use of resources as well as highlight the ecological importance of wildlife species and biological diversity. Visitors can engage in a number of activities at various information centres which include guided tours and nature walks of the local area, bird watching, educational day trips, tree plantations and boat safaris where possible. Interactive displays also allow children and students to learn about local species. (Source: WWF Pakistan)

### 3. 4. 7. Murree Biodiversity Park

The provincial Government of Punjab planned a residential development scheme in Murree – a popular hill resort near Islamabad over an area of 16 ha. The project became highly controversial environmental issue and the government decided to abandon the housing plan and instead decided to make the site a biodiversity conservation park. IUCN Pakistan was requested to conceptualize, plan, and develop the park. After successful completion, the park has become an example of government's commitment to convert a commercial venture into a conservation initiative. The park has a remarkable altitudinal variation of over 550 feet with nine microhabitats, 113 species of plants, 13 species of mammals, 43 avifauna, 3 Herpetofauna and 50 Entomofauna with 41 butterflies and moths.

### 3. 4. 8. Conservation of Endangered Species

**Re-introduction of Chinkara**

Chinkara - once commonly found in arid and semi-arid habitats of Pakistan, became restricted to a few small pockets due to habitat loss and over hunting. Khyber Pakhtunkhwa Province took initiative for captive breeding of chinkara and re-introduction in Manglot Wildlife Park covering an area of 1764 acres. The tract falls in sub-tropical evergreen scrub forest zone characterized by Phulai (*Acacia modesta),* Kao (*Olea ferruginea),* and Gurgura (*Monotheca buxifolia)* as major tree species. The establishment of the park also helped sensitize local people inhabiting the vicinity of the park regarding importance of wildlife conservation. The park also provides wildlife-based recreational opportunities to local people in particular and people of nearby districts in general. The Chinkara population increased and started causing damage to agricultural crops around the park. The local farmers are compensated for the damage caused to their agricultural crops. The area where chinkara population rehabilitated is privately-owned and used by local people for sustainable harvest of firewood, grass cutting and livestock grazing. (Source: KP Wildlife Department)

**Chir Pheasant (*Catreus wallichii*)**

Chir Pheasant was exterminated from most of its habitat and efforts for its re-introduction failed. Azad Jammu and Kashmir (AJK) is one of the important areas that harbours natural population of chir pheasant in Pakistan. A recent survey from July 2010 to June 2011 estimated a total of 579 birds from 28 study sites. Highest population

(n=434) was recorded at Qazi Nag Game Reserve, followed by Phalla Game Reserve (n=117) while minimum population (n=28) was noted at Pir Chinasi area. A trend of increase in population was observed when results compared with previous data. Population increased from 194 in 2002 to 462 in 2011 in Pir Chinasi and Qazi Nag area (Jhelum Valley). (Source: AJK Wildlife and Fisheries Department)

**Western Horned Tragopan** *(Tragopan melanocephalus)*
Western Horned Tragopan is an endangered species. In Pakistan, its viable population still survives in Duber and Palas valleys in Indus Kohistan, and Machiara National Park (MNP) AJK. The estimated population in the Park is more than 91 birds. The population of this pheasant is increasing continuously. Beside Machiara, another viable population (40-50 birds) also resides in the Salkhala Game Reserve and small isolated pockets in Kuttan and Salampura areas of Neelum valley are also recorded. Similarly, small isolated populations are still found in Moji game Reserve, Qazi Nag Game Reserve and around Haji Pir areas in district Bagh. The Western Tragopan has been chosen as keystone species to monitor the overall health of ecosystems in MNP. The recent increase in population density of Western Horned Tragopan, as compared to census of 1982, indicates improved management of the Park. (Source: AJK Wildlife and Fisheries Department)

**Musk Deer *(Moschus chrysogaster):***
A small sized deer, with hind legs longer than the forelegs and conspicuous outstanding ears. A shy and solitary animal, it usually remains within a range of 2400-4500 m elevation close to some mixed conifers and sub alpine scrub forest. This animal is evaluated as threatened on the IUCN Red List of Threatened species. During different surveys and study the animal was recorded from Musk deer National Park and Machiara national Park, in Neelum Valley. The total estimated population is between 64-68 individuals in Machiara National Park, but after 2007, when the Musk Deer National Park was established, its population has increased. (Source: AJK Wildlife and Fisheries Department)


Musk Deer in Neelum valley (Photo: Munawar Iqbal)

**Woolly Flying Squirrel (*Eupetaurus cinereus)***
The Woolly Flying Squirrel *(Eupetaurus cinereus)* is the largest flying squirrel and one of the largest gliding mammals in the world. Only a few skin specimens were recorded in British Museum and the Bombay Museum of Natural History - except one trade specimen- from Pakistan. It is currently known to live only in caves and crevices on steep cliffs in the dry conifer forest zone of northern Pakistan. Considered extinct till its rediscovery in 1994 from Sai Nullah in Gilgit-Baltistan this species is again at the verge of extinction due to rampant deforestation of its habitat. A number of valleys in the region identified as the core area for *Eupetaurus cinereus* have been stripped of trees over the last 15 years. This has led to the species being listed as Endangered (A2c+3c; C1) by IUCN. The core area of occurrence of species is estimated to be less than 1500 square kilometers. It is estimated that at the current rate of habitat loss the precarious population may be reduced to 50% in the next ten years. Wildlife Conservation Society (WCS) Pakistan Programme is working in the habitat of this species since 1997, and its community based conservation work is helping in protection of forests and wildlife in many of the valleys in the region.(Photo and Text Credits: Wildlife Conservation Society-Pakistan Program)

**3. 4. 9. Loss of Biodiversity "A Serious Threat to Human Well-being"**

**Shounther valley's response to degradation and devastation**
Shounther valley is situated in the Himalayan Dry Temperate forests where winter is severe and long and wood is the only source to meet

the heating and construction requirements, exerting pressure on the forests resulting in denuded slopes. Avalanches during winters and landslides during rains is a common observation. Sometimes this phenomenon becomes so severe that human lives and settlements are at risk. The local community of the Shounther in the Neelum Valley realized that losses could be minimized by conserving forest resources in a sustainable way for the present and the future.

Forest Department is the sole custodian of forest resource and responsible for management but due to legal constraints cannot involve the local communities in forest management. Despite the legal bottlenecks the communities of Shounther sub-valley decided to contribute to sustainable management of the forest area. Through a consultative process, they have divided the adjacent forest amongst the dependent families, agreeing on type and extent of use and responsibilities for conservation. Each family was allowed to utilize only its own designated forest area and try to manage it on sustainable basis to fulfill their timber, fuel wood, fodder and livestock grazing needs. As a result, in this sub-valley, degradation of the ecosystems has reduced almost up to 30%. Protection of small patches of *Betula utilis* (Birch forest) in Shounther and Domel Balla is the typical example of this ownership where fuel wood, timber and lopping (for stall feeding) are strictly prohibited by the communities. (Source: AJK Forestry Department. Photo by Mr. Rauf Qureshi)

### 3. 4. 10. Socio-economic Crises Draw Attention to Urgent Need for Conservation in Balochistan

***Haloxylon Persicum*** (Tagaz) is an important vegetation type in Balochistan and is a major source of forage for camels and is a good binder for sand dunes stabilization. It grows in the saline, arid and desert areas of Chagai,

Kharan, Washuk and Nushki districts and covers more than 60 percent of the area in the District of Washuk. The leaves of Tagaz are soft and palatable, and digestible by camels. The wood of Tagaz has high calorific value and is a good source of forage during winter season and droughts. However, local people have been cutting Tagaz ruthlessly for sale as fuel wood to earn livelihood because it is the only source of income in the deserts. The wood of Tagaz is also used for making superior quality charcoal.

Camels are in big demand in Middle East and the price of a healthy camel ranges between $1,000 to $2,000. However, due to degradation of Haloxylon ecosystem, forage availability for camels has decreased resulting in a decline of their population and weaker animals as they have to travel long distances to feed. In addition, the droughts in recent years have caused heavy mortality of camels due to non-availability of forage. In Washuk district alone, between 1999 and 2005, 23,804 camels died during the drought.

The socio-economic problem caused by loss of livelihoods due to decline in camel population, heavy camel mortality, and poor camel nutrition has finally drawn government and public attention to this serious issue and government has drawn an ambitious plan to restore the health and condition of Haloxylon ecosystem. (Source: Balochistan Forest Department)

### 3. 4. 11. Man & Biosphere Reserves

There is a growing realization that nature conservation and ecosystem based approaches are becoming increasingly difficult, especially in the unique ecosystems. Therefore efforts are underway to conserve these ecosystems through the establishment of Man & Biosphere reserves. Until recently, Pakistan had one Man &

Biosphere Reserve and now the second M&B Reserve has been established to conserve Juniper ecosystem. A dossier has been completed for the nomination of Central Karakorum National park on the M&B Reserves list. In addition, plans are underway to nominate more sites for listing in M&B reserves.

**Juniper Man & Biosphere Reserve**

The Juniper forest ecosystem in Ziarat is believed to be largest forest of its kind in the world. It was recently declared a Man & Biosphere Reserve. It is spread over 100,000 ha. The Juniper species is listed as one of the oldest living trees on earth, with the age of a mature tree exceeding 1500 years. Juniper tree species of Ziarat have both a local significance to support livelihoods as well as a global significance for their long life and slow growth rate. To conserve fragile this ecosystem a UNDP-funded project was launched titled 'Mainstreaming Biodiversity Conservation into the Production Systems of Juniper Forest Ecosystem". The attitudinal change that occurred as a result of the project led to the realization that Balochistan had natural wealth that was not recognized globally. Hence efforts towards designating Ziarat Juniper Forests as a Biosphere Reserve were initiated by IUCN Pakistan back in 2010. With the collective decisions of the custodian communities and the Balochistan Forest and Wildlife Department, IUCN assisted in preparation of the nomination dossier. This was endorsed by the Government of Balochistan and the communities.

To meet the criteria for recognition as MAB, a management plan was formulated and approved by the Government of Balochistan. IUCN held consultations with all the stakeholders, local communities and relevant government departments, utilizing its strong relations with key government officials of Balochistan who played an active role in the process.

IUCN's efforts received a boost in 2013 when the Juniper Forest Ecosystem of Ziarat, in Balochistan province, made its way to the recognized World Network of Biosphere Reserves which currently comprise 621 biosphere reserves in 117 countries, including 12 trans-boundary sites. The decision was made during the 25th session of the International Coordinating Council of UNESCO's Man and the Biosphere Programme (MAB), making the Juniper Forests of Ziarat the second declared Biosphere Reserve in Pakistan. (Source: IUCN Pakistan).

**3. 4. 12. Forest Regeneration**

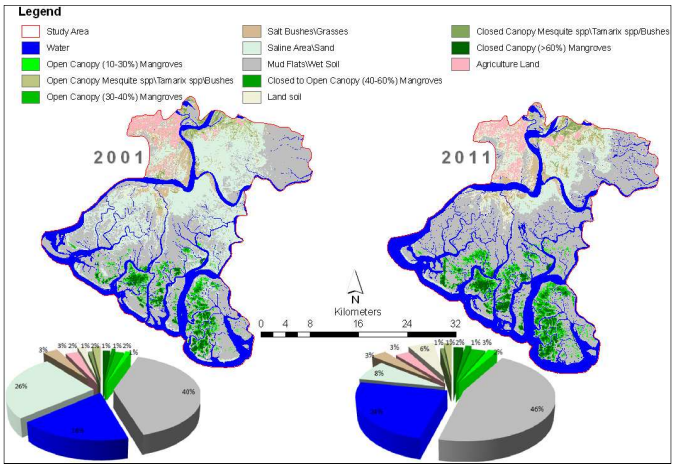
Swat a princely State in northern Pakistan until 1969 is richly endowed with precious temperate forest that was sustainably managed by the State. After meeting *bona fide* needs of local communities, the surplus was marketed as revenue for the State. After the merger of the State with Pakistan, local communities claimed their rights over these forests and government failed to exercise its control over forest reserves leading to rapid deforestation and degradation. It was not until 1975, that the forests and non-cultivated lands were declared government property and local communities were entitled to 60 percent of the share from commercial sales. However, the villagers continued to resist the governmental control being the de facto owners and forests continued to degrade due to stealing of trees for timber, fuel wood, and grazing of livestock owned both by locals and migratory pastoralists.

While the Joint Forest Management has been successfully practiced in India since long, Pakistan has just made a beginning by piloting it in one watershed covering 6300 ha in Miandam valley. A Joint Forest Management Committee (JFMC) has been constituted by the stakeholders of seven compartments. The Committee has controlled smuggling of timber from the valley and decided to salvage dry and wind fallen trees so that the local communities could get some income and create jobs. The Committee has also banned the traditional practice of leasing pastures to migratory pastoralists and put in place a system of rotational grazing for local communities.

Consequently there is profuse natural regeneration in degraded forests. The Committee has also imposed complete ban on poaching of wildlife. The medicinal and aromatic plants (MAPs) that were previously improperly harvested and processed are now harvested in a sustainable manner whereas the improved processing and marketing is brining better economic returns. The success of this pilot JFM brings hope for improvement of the health of forest ecosystems and economic wellbeing of the local communities. (Contribution: Mr. Sana Ullah Khan, KP Forest Department)

**Successful Reforestation of Mangrove Biomes**

Mangrove forest in this region is among the largest arid climate mangrove in the world. In Pakistan, fresh water discharge in the delta region is the main cause of the survival of the mangrove forest. Here also stand the serious problems of over exploitation and progressive sedimentation. Focusing on the 10 year change analysis on mangroves cover of Kharo Chann taluka, Indus Delta, this study contributed to the understanding of the changes in distribution and total area of mangrove forests in the area. Multi-temporal (2001 and 2011) imagery of Terra (ASTER) satellites was used to analyze the extent of mangrove cover. An increase of 2,568 ha in mangroves, particularly in *Avicenna marina* has been identified in this study. Accuracy of the developed forest cover maps was 92.7 % and has the kappa value of 0.88. This increase is attributed to plantation activities and natural regeneration as well. But most of the patches are due to the natural growth of the mangroves particularly *Avicenna Marina* which mainly is due to the increase in the fresh water streaming down Kotri barrage through continuous yearly flooding since 2010. (Source: WWF Pakistan)




### 3. 4. 13. Agrobiodiversity

***Saarra Ghanum* - A Cherished Local Wheat Variety**

*Saara Ghanum* has outperformed hybrid wheat varieties in Balochistan. The wheat plants are grazed by small ruminants soon after germination when they are at two to five leaf stages. Despite grazing at an early stage, the farmers still get a good grain yield per unit area. *Saarra Ghanum* meaning Cold Wheat is also disease resistant and drought tolerant. On the other hand if exotic wheat variety is sown and grazed it yields only 50 percent of the local variety. Therefore in order to keep the variety pure, other seeds are not introduced in the area. In order to avoid contamination from fertilizers and pesticides, and to prevent infestation, the farmers store seeds in airtight mud structures. (Contribution: Dr. Khair Muhammad Kakar).

**Olive oil from wild olive**

The wild olives are widely distributed in Baluchistan and primarily used for grazing of livestock. Tender shoots are used as fodder for stall feeding of the large animals. The dried olive fruits are also used by the local communities for feeding their livestock. Due to prices of cooking oils, the local farmers have now started pressing olives for obtaining cooking oil. The improved cultivated varieties of olives yield 14 to 16 percent olive oil while wild olive of Balochistan produces 8 to 10 percent olive oil. This percentage is reflective of the friendly environment available for the olives existing in the respective areas. Now the local communities have stopped cutting wild olives and are thus conserving the local ecosystems and associated biodiversity.(Contribution: Dr. Khair Muhammad Kakar).

***Beurekh* –A dual Purpose Sheep Breed**

Balochistan is blessed with a plenty of native breeds of livestock and one such breed of sheep is called *Beurekh*. The important characteristics of this breed include quick weight gain and long clean white wool, disease resistance.

This climatically suitable breed is restricted to only two districts - Musakhail and Barakaan. The farmers diligently work to conserve the purity of the breed and do not allow any cross breeding. (Contribution: Dr. Khair Muhammad Kakar).

***Bahag Narri* – a Local Cattle Breed**

The livelihoods of the rural people in Balochistan province depended mainly on livestock. Here are some local breeds best suited to local environment. Where as many introduced breeds could not tolerate harsh local environment, *Bahag Narri* breeds well in local conditions and has good drought tolerance and produces good meat. After incurring heavy losses in trying to keep high yielding non-local breeds, the farmers now prefer their own cattle. (Contribution: Dr. Khair Muhammad Kakar).

**Appendix I**

## Information Concerning the Report Making Party and the Preparation of the Fifth National Report

### Information Regarding the Report Making Party

| | |
|---|---|
| Contracting Party | PAKISTAN |
| **NATIONAL FOCAL POINT** | |
| Full name of the institution | Biodiversity Directorate, Climate Change Division, Cabinet Secretariat, Government of Pakistan<br>ISLAMABAD |
| Name and title of contact officer | *Naeem Ashraf Raja*<br>Director Biodiversity Programme |
| Mailing address | Director Biodiversity Programme, Climate Change Division, Cabinet Secretariat, Government of Pakistan , Local Government Complex, G-5/2, ISLAMABAD |
| Telephone | *+92+51+9245601* |
| Fax | *+92+51+9245590* |
| E-mail | naeemashrafraja@yahoo.com |
| **SUBMISSION** | |
| Signature of officer responsible for submitting national report |  |
| Date of submission | ***March 31, 2014*** |

**Process Used To Prepare This Report**

The Fifth National Report to CBD was prepared as a part of the NBSAP revision process that is being conducted through a GEF Trust Fund project namely "Support to Pakistan for the Revision of the NBSAPs and Development of Fifth National Report to the CBD". The funds were accessed through UNEP. Keeping in view the experience of preparation of the first Biodiversity Action Plan, the project is being executed in collaboration with IUCN Pakistan.

The process of the preparation of 5th NR was started with an in-house brainstorming session within the forestry wing of Climate Change Division. It was decided that instead of calling a stakeholders meeting at Islamabad, each of the four Provinces and territories of Azad Jammu and Kashmir and Gilgit-Baltistan should be visited and meetings held with the local stakeholders. The provinces and territories were contacted through offices of Additional Chief Secretaries and relevant departmental secretaries who at the same time were requested to

nominate focal points at the provincial/ territorial level and constitute Biodiversity Working Groups at provincial level to facilitate the coordination between federation and the provinces/territories.

An inception meeting was held at Islamabad involving local members of Biodiversity Working Group, academia, relevant NGOs, government departments, research institutions, and key resource persons. The structure of the fifth national report, as envisaged in the guidelines prepared by the CBD secretariat, was discussed and the process of consultation with stakeholders was discussed. The 5th National Report was also discussed at a meeting held at the Climate Change Division, with environment secretaries of the provinces, chaired by the Secretary, Climate Change Division. An agreement was made at this meeting to have provincial focal points and biodiversity working groups to improve coordination and implementation of Aichi Biodiversity Targets.

Thorough consultative meetings were held at Provincial/territorial headquarters with the government departments, relevant NGOs, academic and research institutions and key resource persons. Updates on the achievements of Aichi Biodiversity Targets and trends and status of biodiversity were obtained. Draft report was prepared and circulated among all the stakeholders for comments. The comments and suggestions were addressed and the final report was prepared.

**Information of Stakeholders Involved**

The stakeholders comprised policy and planning agencies of the government, sectors implementing policies in the provinces and regions, conservation and development NGOs, and experts in biodiversity. Following is a list of the stakeholders consulted.

1. Climate Change Division, Government of Pakistan
2. Planning Commission, Government of Pakistan
3. Inspector General of Forests, Government of Pakistan
4. Directorate of Biodiversity, Government of Pakistan
5. Ministry of Food Security
6. Commissioner Agriculture, Ministry of Food security, Government of Pakistan
7. Commissioner Livestock, Ministry of Food Security, Government of Pakistan
8. Pakistan Museum of Natural History, Ministry of Science and Technology, Islamabad
9. PEPA-Pakistan Environment Protection Agency
10. Plant Genetic Resource Institute, Pakistan Agriculture Research Council, Government of Pakistan
11. Zoological Survey of Pakistan, Government of Pakistan, Islamabad
12. United Nations Development Programme, Islamabad, Pakistan
13. Sustainable Land Management Project, GEF/UNDP, Government of Pakistan, Islamabad.
14. Mountain Biodiversity Conservation Project, GEF/UNDP, Government of Pakistan.
15. CITES Management Authority, Climate Change Division, Government of Pakistan, Islamabad.
16. Forestry, Livestock and Fisheries Department, Government of the Punjab, Lahore.
17. Forestry and Wildlife Department, Government of Sindh, Karachi
18. Livestock and Fisheries Department, Government of Sindh, Karachi.
19. Marine Fisheries department, Government of Sindh, Karachi.
20. Coastal Development Authority, Government of Sindh, Karachi
21. National Institute of Oceanography, Government of Pakistan, Karachi
22. Forestry and Wildlife Department, Government of Gilgit-Baltistan, Gilgit
23. Planning and Development Department, Government of Azad Jammu and Kashmir, Muzafarabad
24. Forestry Department, Government of Azad Jammu and Kashmir, Muzaffarabad.
25. Fisheries and Wildlife Department, Government of Azad Jammu and Kashmir, Muzaffarabad
26. Agriculture Department, Government of Azad Jammu and Kashmir, Muzaffarabad
27. Livestock Department, Government of Azad Jammu and Kashmir, Muzaffarabad
28. Environmental Protection Agency, Government of Azad Jammu and Kashmir, Muzaffarabad
29. Planning and development Department, Government of Balochistan, Quetta
30. Forestry and Wildlife Department, Government of Balochistan, Quetta

31. Agriculture Department, Government of Balochistan, Quetta
32. Fisheries Department, Government of Balochistan, Quetta
33. Environmental Protection Agency, Government of Balochistan, Quetta
34. IUCN- International Union for Conservation of Nature, Karachi, Pakistan
35. WWF - World Wildlife Fund, Lahore, Pakistan
36. Inter Cooperation Pakistan, Peshawar.
37. SUSG- CAsia, Sustainable Use Specialist Group, Quetta, Pakistan
38. STEP Society for Torghar Environment Protection, Quetta
39. HWF – Himalayan Wildlife foundation, Islamabad
40. BRS – Bioresources Research Center, Islamabad, Pakistan
41. SDPI-Sustainable Development Policy Institute, Islamabad
42. Quaid-i-Azam University, Islamabad
43. International Islamic University, Islamabad
44. Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi
45. Agriculture University, Peshawar.
46. Azad Jammu & Kashmir University, Muzaffarabad
47. University of Quetta, Baluchistan
48. Key Resource Persons: Dr. Abdul Aleem Chaudhry, Mr. Ashique Ahmed Khan, and Raja Atta Ullah Khan.

## Appendix II

## Further Sources of Information

**Sources of Information on National implementation**

The institutional mechanism for implementation of CBD is weak at the national level and nonexistent at provincial and regional levels. Consequently the country failed to set any targets or do any concerted effort for the implementation of Strategic Plan 2010-2020 and Aichi Targets. Therefore, there were no documents or reports to prepare the national report and reliance had to be placed on interviews with key stake holders and other knowledgeable persons to identify activities undertaken in different sectors that were in line with the Strategic Plan 2000 and Aichi Biodiversity targets.

The biodiversity Outlook was updated through two reports on Flora and Fauna prepared by consultants. In addition contributions were made by different stakeholders. Information from The World Bank Report No. 36946-PK "Pakistan Strategic Country Environmental Assessment, August 2006 was used in Part I of the report.

**Website Addresses**

The government has established a Clearing House Mechanism and its address is as follows:
biodiversitychm.gov.pk

**Publications**

1. Consultative workshop on Access to Genetic Resources and Benefit Sharing (ABS) Law for Pakistan September 14 and 15, 2011, Islamabad.
2. Provincial Consultative Workshops on Draft Law on Access to Genetic Resources and Benefit Sharing (ABS).
3. Draft Pakistan Access to Genetic Resources and Benefit Sharing Act.
4. Study on Capacity Assessment for Access and Benefit Sharing (ABS) and Preservation of Traditional Knowledge (TK) arising from their Utilization.
5. Assessment of Capacity Needs in areas of in-situ and ex-situ conservation in the context of CBD and BAP with particular focus on meeting global biodiversity targets.
6. Pakistan Ecological and Financial Gap Analysis of the Protected Areas.
7. Assessment of Plants and Animals Taxonomic Status and Gaps in Protected Areas of Pakistan.
8. Pakistan's National Clearing House Mechanism - Progress Report
9. Pakistan's National Biodiversity Clearing House Mechanism - Working Strategy for CHM Stakeholders

**Databases**

Biodiversity Global Networking (BGN) project is one of the most important IT projects of PMNH funded by Ministry of Science and Technology. The Project has been completed and is in working condition. The project was aimed to carry out automation and networking of PMNH, both in terms of research and public education. It is likely to increase significantly as follows:- Efficient Maintenance / Retrieval of Record Web Publishing of Information (www.pmnh.gov.pk) Provision of Maximum Information to public Sharing of Biodiversity Data with Global Biodiversity Information Facility (GBIF) BGN project is part of the programme entitled "Global Biodiversity Information Facility"(GBIF). The Global Biodiversity Information Facility (GBIF, http://www.gbif.org/) is an

independent international organization whose overall mission is to work with its partners ie. countries, international organizations, natural history museums, herbaria, the scientific and IT communities, and the international biodiversity-related conventions, to provide free and universal access to the world's primary biodiversity data. PMNH is the only focal point of GBIF here in Pakistan and in this regard an MOU had been signed with GBIF in 2001. PMNH is the Associate Participant of GBIF and has started sharing the scientific data in the field of biodiversity of Pakistan with GBIF through PMNH NODE.

**National Reports Submitted to other Related Conventions, Forums and Organizations**

- National Report submitted to Convention on Migratory Species (CMS) 31 March 2011.
- Annual Report Submitted to Convention on International Trade in Endangered Species of Flora and Fauna (CITES) on 12 February 2013.
- National Report on the Implementation of the Ramsar Convention on Wetlands submitted to CoP 11 June 2012.

**Appendix III**

## National Implementation of the Thematic Programmes of Work and Plans

**Table 11. Review of Implementation of Programmes of Work on Agrobiodiversity**

| Global Goals ,Targets and Activities | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| An overview of the status and trends of the world's agricultural biodiversity, their underlying causes and knowledge of management practices. | No national targets | No national level actions | No contribution | No change | Not defined |
| Identify adaptive management practices, technologies and policies that promote the positive effects and mitigate the negative impacts of agriculture on biodiversity and enhance productivity and the capacity to sustain livelihoods by expanding knowledge, understanding and awareness of the multiple goods and services provided by the different levels and functions of agricultural biodiversity. | No national targets | No national level action | No contribution | No change | Not defined |
| Strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage agricultural biodiversity sustainably so as to increase their benefits and to promote awareness and responsible action. | No national targets | No national level action | No contribution | No change | Not defined |
| Support the development of national plans and strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration. | No national target | No national level action | No contribution | No change | Not defined |

**Table 12. Review of Implementation of Programmes of Work on Biodiversity of Dry Land and Sub-Humid Lands**

| National targets developed, if any | National Targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| Assessment of the status and trends of biological diversity | No targets | None | None | Very low priority for conservation | None |
| Identification of specific areas of value for biological diversity, with reference to the criteria in annex I to the Convention | No targets | None | None | Continued loss of biodiversity | None |
| Development of indicators. | No target | None | None | no change | None |
| Building knowledge on ecological, physical and social processes. | No target | Knowledge gained through GEF pilot project in various eco zones | Some knowledge gained. | Follow up full scale GEF project approved | None |
| Identification of local and global benefits derived from biological diversity | No targets | Land use planning, sustainable agricultural practices tested, and | Knowledge gained will help prevent land degradation and conserve biodiversity. | Increased interest in land use planning. | None |
| Identification and dissemination of best management practices, including knowledge, innovation and practices of indigenous and local communities. | No targets | Success stories under GEF pilot project documented. | Shared knowledge on best practices | Best practices ready for scaling up | None |
| Establishment of additional protected areas | No targets | No activity | None | No change | Protected Areas |
| Appropriate management and sustainable use of water resources. | No targets | Traditional practices sustainable | None | Practices already adopted | None |
| Management of invasive alien species. | No targets | None | Mesquite is widely distributed and spreading fast to degraded lands. | Mesquite infestation increasing, but solving fuel wood shortages. | None |
| Promotion of responsible resource management, at appropriate levels, applying the ecosystem approach through an enabling policy environment. | No targets | Policies drafted during pilot GEF project, but not approved | None | No change | Policy instruments |
| Support for sustainable | No targets | Value chain | none | Livelihoods | Value chains |

| | | | | | |
|---|---|---|---|---|---|
| livelihoods, through diversifying sources of income, promotion of sustainable harvesting including wildlife; exploring innovative sustainable use of biological diversity. | | addition tested during pilot GEF project | | improvement | |

**Table 13. Review of Implementation of Programmes of Work on Forest Biodiversity**

| Global goals, targets and activities | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| 1. Apply the Ecosystem Approach to the management of all types of forests. | none | None | none | Except for trees, other components of ecosystem values and goods are declining | Not developed |
| 2. Reduce the threats and mitigate the impacts of threatening processes on forest biodiversity. | none | None | none | Gradual loss of forest biodiversity | Not developed |
| 3. Protect, recover and restore forest biodiversity | none | Legal protection cover available | Forest legislation being revised in all provinces. One province has already enacted revised forest act | No targeted activities implemented to recover and restore forest biodiversity | Not developed |
| 4. Promote the sustainable use of forest biodiversity. | none | Actions underway to promote sustainable use of Non-timber Forest Products in selected areas | No significant contribution but the need is being increasingly felt for value chain addition | A national pilot project for marketing and value chain addition is being implemented | Species marketed |
| 5. Access and benefit-sharing of forest genetic resources | none | Draft ABS legislation prepared | Laws being formulated | No significant outcome | Act |
| 6. Enhance the institutional enabling environment | No target | Institutional reform underway in one of 4 provinces. | Not applicable | Community participation and benefit sharing receiving more attention | Not developed |
| 7. Address socio-economic failures and distortions that lead to decisions that result in loss of forest biodiversity | No targets | National poverty alleviation programs, addressing area development issues. | Improvement in rural economy and poverty reduction | Fuel efficient technologies, alternative fuels, and greater use of metal sheets in roofing reducing dependence on forests. | Not developed |

| Global goals, targets and activities | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| 8. Increase public education, participation and awareness | No targets | International Day of Forests celebrated and awareness programmes about the importance of Forest Biodiversity highlighted | Country is fully participating in achieving the global objectives | Forest Biodiversity is being reflected in new policies, laws and management plans. Creation of Forest Development Fund created in one of the four provinces | No. of policies, laws and plans. Proposals financed through FDF |
| 9. Characterize and analyze forest ecosystem to global scale and develop general classification of forests on various scales in order to improve the assessment of status and trends of forest biodiversity | None | None | None | None | None |
| 10. Improve knowledge on and methods for the assessment of the status and trends of forest biodiversity | None | None | None | None | None |
| 11. Improve understanding of the role of forest biodiversity and ecosystem functioning | None | Economic valuation of juniper ecosystem in Ziarat | No significant contribution | None | Studies/Evaluations |
| 12. Improve the infrastructure of data and information management for accurate assessment | None | GIS facilities established in most of the provinces and one at the federal level | None | Land use atlas prepared. Vegetation assessment in 52 districts | Facilities, Publications, Data base |

**Table 14. Review of Implementation of Programmes of Work on Inland Waters**

| Goals | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| To integrate the conservation and sustainable use of biological diversity into all relevant sectors of water-resource and river-basin management, taking into account the ecosystem approach. | No national targets | National Wetlands Policy drafted. National water policy drafted | None | Policies formulated but no action | Sectors |
| To establish and maintain comprehensive, adequate and representative systems of protected inland water ecosystems. | The inland waters mainly comprise of rivers, dams, barrages; mainly used for irrigation and hydropower. There are some wetlands that are seasonally inundated, and few other large lakes scattered throughout the country | A comprehensive assessment carried out on key inland wetlands in Pakistan; Broghil and Kurambar National Parks established based on the high altitude wetlands ecosystems there; Mahaseer National park in AJK established | Contribution to Millennium Development Goals 1 and 7 | Protected areas network enhanced | Protected Areas |
| To enhance the conservation status of inland water biological diversity through rehabilitation and restoration of degraded ecosystems and the recovery of threatened species. | No national targets | Most of the dams and barrages have been notified as wildlife sanctuaries. In addition, part of river Jhelum in Azad Kashmir has been notified as a national park | Protection afforded to migratory water birds | Greater interest in conservation of wetlands | Area |

| Goals | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| To promote the integration of conservation and sustainable use of the biological diversity of inland water ecosystems into relevant sectoral and cross-sectoral plans, programmes, policies and legislation. | No national targets | Management plans for several inland wetlands developed, including: Broghil Wetland Complex, Taunsa Barrage, Sukkur Dolphin Reserve, Ucchali Wetlands Complex. | Contribution to MDGs goal 7 | None | Sectors |
| To encourage the development, application and transfer of low-cost appropriate technology, non-structural and innovative approaches to water resource management and the conservation and sustainable use of the biological diversity of inland water ecosystems. | PWP project document | Introduction of solar, wind and biogas technologies to wetlands dependent communities in Pakistan | Contribution to goal 1 of MDGs | Poverty alleviation | |
| To provide the appropriate incentives and valuation measures to support the conservation and sustainable use of inland water biological diversity, and to remove, or reform appropriately, any perverse incentives opposing such conservation and sustainable use of ecosystems, as it relates to biodiversity conservation. | No national targets | Incentives in plantations on riparian zones (80:20 ratio); Incentives in biogas plants with 80:20 ratio to conserve forests; incentives to communities in orchards development | Goal 7 and 1 of MDGs | None | Incentives |
| Communication, Education and Public Awareness, giving particular attention to matters relating to the conservation and sustainable use of the biological diversity of inland water ecosystems | No national targets | Awareness raising for wetlands conservation, and capacity building program for wetlands conservation, documentaries on Broghil valley's wetlands, Balochistan coastal region, Water and | . | Awareness of the importance and need to conserve wetlands. | No. of hits on PWP web portal;<br><br>The number of events<br><br>Number of articles in print media, coverage in news and programs on TV |

| Goals | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| | | wetlands, and renewable energy technologies developed and aired on national TV channels | | | |
| Promote the effective participation of indigenous and local communities and relevant stakeholders in the conservation and sustainable use of biological diversity of inland water ecosystems. | No national targets | Built capacity of Wakhi community in Broghil to participate in conservation of high altitude wetlands, and of Kehal community in central Indus to conserve wetlands' biodiversity of fish, and freshwater turtles | Goal 1 of MDGs | Greater interest and awareness regarding conservation and sustainable use of wetland resources | Co-managed wetlands |
| To develop an improved understanding of the biodiversity found in inland water ecosystems, how these systems function, their ecosystem goods and services and the values they can provide | No national targets | Comprehensive assessment | Wetlands of Pakistan receiving attention for conservation and sustainable use. | Knowledge of structure and function of inland water ecosystems increased. | Ecosystem assessments |
| To develop, based on inventories, rapid and other assessments applied at the regional, national and local levels, an improved understanding of threats to inland water ecosystems and responses of different types of inland water ecosystems to these threats. | No national targets | Updating database of Ramsar Sites through a comprehensive assessment program, Identification of potential sites for Ramsar designation,Development of GIS based wetlands catalogue of Pakistan | Improvements in the conservation status of inland waters. | Threats to important wetlands identified | Threats |

| Goals | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| To ensure, projects and actions with the potential to impact negatively on the biological diversity of inland water ecosystems are subjected, in accordance with national legislation and where appropriate, to do suitably rigorous impact assessments, including consideration of their potential impact on sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities. | EIA for all major projects. | Guidelines developed and included in the National Wetlands Policy | National guideline available | Guidelines incorporated in national EIA guidelines. | EIA guidelines |

**Table 15. Review of Implementation of Programmes of Work on Marine and Coastal Biodiversity**

| Global goals, targets and activities | National targets | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation |
|---|---|---|---|---|---|
| Apply appropriate policy instruments and strategies, including building of capacity for the effective implementation of IMCAM | No national Targets | 24 members National Coordination Body (NCB) constituted under Mangroves for the Future (MFF) Programme acts as a national platform of horizontal and vertical integration of coastal and marine government and civil society actors.<br><br>A "Training of Trainers" workshop organized for 27 coastal stakeholders to build local their capacities in Resilience Analysis using the case study of Shyamnagar in Bangladesh.<br><br>More than 100 representatives of government, civil society and academia trained in Integrated Coastal Management through AIT Bangkok and locally in Project Cycle Management.<br><br>Preparation of Pakistan Coastal | National Strategy and Action Plan has been adopted by NCB as key national document on coastal areas.<br><br>Socio-ecological resilience approach of MFF has been adopted as the strategic approach for implementation of MFF Programme including Pakistan.<br><br>A handbook on coastal management prepared. | Influenced by institutional structure of NCB, Ministry of Defence has opted to join NCB as a member to participate in discussion on contemporary coastal management issues.<br><br>The National Climate Change Policy of Pakistan 2011 emphasises on development of adaptation strategies to climate change impacts on coastal and marine ecosystems.<br><br>A locally customised short course training module developed through AIT trained ICM course Alumni which will be piloted by NED University Karachi during 2014.<br><br>Enhanced | Notification of NCB as a national platform to discuss coastal and marine resource management issues.<br><br>MFF small medium and regional grant projects being implemented under supervision of NCB Pakistan.<br><br>National Climate Change Action Plan prepared by the Climate Change Division.<br><br>MFF Programme reports |

| Global goals, targets and activities | National targets | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation |
|---|---|---|---|---|---|
| | | Programme is underway. | | capacity of coastal institutions in ICM, resilience analysis and project cycle management | |
| Undertake direct action to protect the marine environment from negative impacts | No national targets | NCB members through PNC of IUCN Pakistan advocated for undertaking EIA/SEA of planned mega coastal township schemes | Scientific knowledge and experiences shared regionally through scientific papers on fisheries by-catch. | Marine environment not protected from negative impacts | Proceedings of Regional Symposiums on Fisheries organized under MFF Programme |
| To develop guidelines for ecosystem evaluation and assessmen -- paying attention to the need to identify and select indicators, including social and abiotic indicators that distinguish between natural and human-induced effects. | No national targets | Guidelines on Economic Valuation of Forest Ecosystems prepared by MoCC<br><br>Guidelines on preparation of small, medium and large grants prepared and adopted regionally under MFF Programme including Pakistan | Guidelines developed | Guidelines ready for use | Documented guidelines on Economic Valuation of Forest Ecosystems<br><br>Documented guidelines of MFF Programme under implementation on projects' selection |
| To promote ecosystem approaches for the conservation and sustainable use of marine and coastal living resources. | No national targets | Two representatives of NCB trained in Mangrove Ecological Restoration organized in collaboration with Sirindhorn International Environmental Park Thailand, and Bay of Bengal Large Marine Ecosystem Project (BoBLME). | Scientific knowledge and experiences shared regionally through scientific papers on fisheries by-catch and monitoring of mangroves. | Enhanced capacity for ecosystem approach for conservation. | Proceedings of Regional Symposiums on Fisheries organized under MFF Programme |

| Global goals, targets and activities | National targets | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation |
|---|---|---|---|---|---|
| | | One representative of member organization NCB received training in scientific paper writing | | | |
| The biological and socio-economic consequences of physical degradation and destruction of key marine and coastal habitats including mangrove ecosystems, and to restore mangrove forests. | No national targets | Two attempts during 2009 and 2013 were made by Sindh Forest & Wildlife Department to plant highest number of mangrove plants in one day to set a record for Guinness Book of World Records<br><br>The small, medium and regional grant projects have been implemented under MFF Programme to address coastal ecosystems management issues. | Large scale mangrove restoration programme initiated by the Government of Sindh in coastal areas of Sindh province in collaboration with IUCN.<br>National Assessment Report on coastal erosion documented, and shared findings nationally and regionally.<br>More than 10,000 mangrove areas replanted with mangroves under donor, government and private sector sponsored projects organizations. | All mangrove areas along the coast of Sindh province declared as protected forests in November 2010 by the Government of Sindh.<br><br>Regional Master Plan for the Left Bank of Indus Delta and Coastal Zone included mangroves as biological wall to prevent erosion by Outfall Drain and Tidal Link, as one of the priority interventions. | Government of Sindh Gazette Notification<br><br>Regional Master Plan prepared by Sindh Irrigation Develop-ment Authority.<br><br>National Assessment Report on Coastal Erosion prepared under MFF Programme available with IUCN Pakistan<br><br>Reports of donor, government and private sector sponsored projects implement-ed by Sindh Forest Department, IUCN and WWF Pakistan. |
| The impacts of mangrove forest destruction. | No national targets | No study on impacts of | None | Lack of information of | Impact assessments |

| Global goals, targets and activities | National targets | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation |
|---|---|---|---|---|---|
| | | mangrove destruction | | the policy and planning | |
| Enhance the conservation and sustainable use of biological diversity for marine living resources in areas beyond the limits of national jurisdiction. | No national targets | | | Regional Call for Action in Mangroves Restoration was endorsed by Regional Steering Committee (RSC) of MFF Programme held at Karachi in 2011. The Call of Action was made at the CoP 11 of CBD held in India in October 2012. | RSC meeting Proceedings available on MFF Programme website. |
| Establish and strengthen national and regional system of MCPAs. Integrate IT into a global network as a contribution to globally agreed goals. | No national targets | No marine protected areas | None | Marine biodiversity not protected | Protected Areas |
| Promote use of techniques, which minimize adverse impact of mariculture on marine and coastal biological diversity. | No national targets | No action taken | None | Mariculture likely to have adverse impact | Training for Mariculture |
| Achieve better understanding of the pathways, the causes of the introduction of alien species and the impact of such introductions on biological diversity. | No national targets | No action taken | None | Invasive alien species likely to be introduced. | Trainings |
| Put in place the mechanism to control all pathways, including shipping, trade and mariculture, to prevent potential alien invasive species in the marine and coastal environment. | No national targets | No action taken | None | Alien invasive species likely to spread | Quarantine Measures |
| Maintain an incident list on introductions of alien species | No national targets | No action taken | None | Lack of information for action | Incidents |

**Table 16. Review of implementation of Programme of work on Mountain Biodiversity**

| Global goals, targets and activities | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| Prevent and mitigate negative threats to mountain biological diversity. | No national targets | Empowerment of communities through secure usufruct rights | Community empowerment | Recognition of community role in conservation | Threats Removed |
| Protect, recover and restore mountain biological diversity. | No national target | More PAs established, increase in community conservation area. | Mountain Biodiversity conserved over larger area. | More fragile area protected, and key species conserved. | Area |
| Promote sustainable use and equitable sharing of benefits arising from its use. | No national targets | Increasing number of communities participating in sport hunting | Conservation status of many endangered species improved. | Equitable sharing of benefits promoting conservation | Biodiversity components |
| Enhancing legal, policy, institutional and economic framework. | No national targets | Local institutions being empowered, legal and policy reform under way. | Improvements in status of mountain biodiversity | Recognition of the benefits of community empowerment. | Frameworks |
| Respecting, preserving and maintaining knowledge, practices and innovations of indigenous communities in mountain regions | No national targets | Traditional knowledge and practices honoured | Traditional knowledge and practices protected. | Freedom to use indigenous knowledge and innovations. | Not defined |
| Establish regional and trans-boundary collaboration and cooperative agreements. | No national target | No action | No contribution | No regional cooperation | Agreements |
| Identification, monitoring and assessment of mountain biological diversity | No national Target | local level assessments in selected areas | No contribution. | Lack of information | Ecosystems, species |
| Improve knowledge on and methods for assessment and monitoring | No national Target | No action | No contribution | Lack of knowledge | Methods |
| Infrastructure for data and information management | No national Target | No action | No contribution | Lack of information sharing | Infrastruc-ture |
| Improve research, scientific and technical cooperation and capacity building | No national Target | | | | |
| Increasing public education, participation and awareness | Interna-tional days celebra-tion | International days on biodiversity, forests, environment and | Greater public awareness of global and environmental | Growing interest in conservation. | Tools |

| Global goals, targets and activities | National targets developed, if any | National implementation activities or actions taken | National contributions to achieving global targets and activities | National outcomes | Indicators used for measuring implementation, if any |
|---|---|---|---|---|---|
| | | earth hour organized. | issues | | |
| Promote the development, validation and transfer of appropriate technologies for mountain ecosystems. | No targets | No action | No contribution | Slow progress for conservation of mountain biodiversity | Technolog-ies. |

**Table 17. Review of Implementation of Thematic Programmes of Work on Protected Areas**

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| By 2010, terrestrially and in 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system was established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010 (ii) the Millennium Development Goals - particularly goal 7 on ensuring environmental sustainability and (iii) the Global Strategy for Plant Conservation. | The country has set a target to increase the protected area coverage to 15 percent by 2020, however, time-bound and measurable protected area targets and indicators have not been established. The county boasts of having protected areas over 12 percent area, however many protected areas do not meet internationally accepted definition and criteria. | The following 5 Protected Areas have been established on large relatively intact natural areas (354,232 ha) since submission of the 4th National Report.<br>1) Murree Kahuta Kotli Sattian National Park (Punjab)<br>2) Qurumber National Park (Gilgit Baltistan)<br>3) Musk Deer Gurez National Park (AJK)<br>4) Deva Vatala National Park (AJK)<br>5) Poonch River Mahasher National Park (AJK)<br>6) Zirat Man & Biosphere Reserve Qurumbar NP includes high altitude lakes which lie in the migration route of migratory species.<br><br>There have been no national-level reviews of existing and potential forms of conservation, and their suitability | 12% area is covered by protected areas included in the national list.<br>So far no Marine Protected area has been established.<br><br>There is one National Park in inland water ecosystems. In addition, there are 19 Ramsar sites in Pakistan. Data about three inland wetlands have been collected for Ramsar Information Sheet (RIS). These three sites are expected to be included on wetlands of international importance in near future.<br><br>There are about 114 Protected Areas under management and participation of local communities and relevant stakeholders is minimal. | Most terrestrial ecosystems are covered except minor gaps. Inland waters of biodiversity significance are Ramsar sites. There are no marine PAs. | Area |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| | | including innovative types of governance for protected areas<br><br>A protected area system gap analysis was completed in 2012 and prior to that a protected area system review was undertaken in 2000.<br><br>No national plan has been prepared to protect highly threatened or highly valued areas.<br><br>The country has not establishment any protected area with the aim to benefit local communities | | | |
| By 2015, all protected areas and protected area systems will be integrated into the wider land and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept, (where appropriate) of ecological networks. | No National targets | No serious effort has been made to integrate the protected area systems into the wider land and seascape, and other relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity and the concept of | None | The anthropogenic pressure on the Protected areas is on the rise | Protected areas |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| | | ecological networks. | | | |
| Establish and strengthen by 2010-2012, transboundary protected areas. Other forms of collaboration between neighboring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach and improving international cooperation. | No national targets | Although there is the potential to establish a four nation transboundary, protecting the Pamir Mountains in Afghanistan, China, Pakistan and Tajikstan, but not feasible at the moment due to the current geo-political situation. Similarly there has been considerations to establish transboundry Protected Areas between Iran and Pakistan, India and Pakistan, and China and Pakistan, but initiatives failed due to geo-political situation. | None | None | Transboundry PAs |
| All protected areas to have effective management in existence by 2012, using participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing on existing methodologies and a long-term management plan with active involvement of the stakeholders. | No national targets | Only seven protected areas namely Hingol, Chiltan Hazarganji, Kirthar, Chitral Gol, Deosai, Machiara and Central Karakorum have some management system in place. The major constraint in | Partial fulfillment of global targets | The health and condition of protected areas that are not being managed is on the decline. | Management Plans |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| | | bringing and expanding site-based management to other protected areas is the lack of financial resources and technical capacity. | | | |
| By 2008, effective mechanism for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas should be in place. | No national targets | There are no effective mechanisms in place to identify and prevent, and/or mitigate the negative impacts of key threats to protected areas in place.<br><br>The environmental impact assessment guidelines are being revised and safeguards being built-in to identify the potential effects on biodiversity and flow of information among all concerned parties to that end.<br><br>The laws are in place to ensure enforcement of urgent measures that can halt the | Partial contribution to global objectives. Legal and policy measures adopted. Key threats to selected PAs removed. | The key threats to seven PAs that are under management are being addressed and health of ecosystems is improving. | |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| | | illegal exploitation of resources in protected areas, and strengthen international and regional cooperation to eliminate illegal trade. | | | |
| Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas. | No national targets | There are no national mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas. However this mechanism in place in a few PAs | Partial contribution to global targets. | Few good lessons learnt that should be expanded to other PAs. | Protected Areas |
| Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and in recognition of their responsibilities, consistent with national laws and applicable international obligations, and the participation of relevant stakeholders, in the management of existing as well as the establishment and management of new protected areas. | No national targets | There is no mechanism in place to ensure full and effective participation in the management of the existing, and the establishment and management of new protected areas.<br><br>Community conservation areas established primarily for sport hunting | Objective partially met. | Lack of effective management of PAs under government management.<br><br>Expansion of community conservation areas. | Protected areas |
| By 2008, review and revise policies as appropriate, including use of | No national targets | There are no policies to provide | No contribution so far. | Effective management of | Policies/Laws |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas' systems. | | a supportive enabling environment for more effective establishment and management of protected areas and protected areas' systems. | | PAs lacking. | |
| By 2010, comprehensive capacity building programmes and initiatives should be implemented to develop knowledge and skills at individual, community and institutional level, and raise professional standards. | No national targets | There are no programmes for capacity building and no initiatives to develop knowledge and skills at individual, community and institutional level, and raise professional standards. | No contribution | Protected areas not fully functional. | Training Programs |
| By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas should be substantially introduced, taking into account decisions of the Conference of the Parties on technology transfer and cooperation. | No national targets | There are no initiatives to develop, validate, and transfer appropriate technologies and innovative approaches for the effective management of protected areas. | No contribution | Protected areas not functional | Innovative Approaches |
| By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and | No national targets | The CoP has not been able to establish sufficient financial, technical and other resources to meet the costs to effectively implement and | A vast majority of Protected Areas continue to be paper parks, ecosystems continue to deteriorate for lack of management. | Financial Allocation | |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| countries with economies in transition and small island developing states. | | manage national and regional systems of protected areas to support the needs of developing countries.<br>A country level protected areas fund (Fund for Protected Areas) has been established and is being implemented to provide small grants in support of improving national systems of protected areas, including necessary regulatory, legislative, policy, institutional and other measures. However, the scope of this fund is currently limited to three National Parks (Hingol, Chitral Gol and Machiara) | | | |
| By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased. | There are no active programmes to increase public awareness, understanding and appreciation of the importance and benefits of | | | | |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| | protected areas. | | | | |
| By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas are developed and adopted. | The standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected areas have not been developed so far. | | | | |
| By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by parties. | No national targets | There are no frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, provincial or national levels. | No contribution to global targets. | Biodiversity value, health and condition of PA ecosystems, and trends not understood. | Assessments |
| By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets. | No national targets | There are no provincial or national systems to enable effective monitoring of protected-area coverage, status and trends and to assist in evaluating progress in meeting global biodiversity targets. | No contribution to global targets. | Knowledge and tools lacking | Systems |
| Scientific knowledge relevant to | No national | There is little or no | No contribution to | Lack of scientific | Knowledge |

| Global Goals, Targets and Activities | National Targets Developed, if any | National Implementation Activities or Actions Taken | National Contributions to Achieving Global Targets and Activities | National Outcomes | Indicators Used for Measuring Implementation, if any |
|---|---|---|---|---|---|
| protected areas is further developed as a contribution to their establishment, effectiveness and management. | targets | effort to develop scientific knowledge relevant to protected areas as a contribution to their establishment, effectiveness, and management. | global targets | knowledge to improve health and condition of PA ecosystems. | |

**Table 18. Matrix for Review of Implementation of Cross-Cutting Issues**

| Cross-cutting issues | Relevant COP decisions, programmes of work, work plans, guidelines and suggested activities | National Implementation and contribution | Outcomes achieved | Future priorities |
|---|---|---|---|---|
| Biodiversity for development | Biodiversity values integrated into poverty reduction strategies and planning processes. | Biodiversity values have not so far been integrated in poverty reduction strategies and planning processes | No change | Action to be included in revised BSAP |
| | A set of tools for biodiversity mainstreaming such as sectoral and cross-cutting good-practice guides and training modules | Biodiversity guidelines developed for Forestry, Agriculture, Tourism, and Construction sectors in Ziarat Balochistan which are relevant for wider adoption.<br><br>Tools, good practices guides and training modules not developed. | Biodiversity not mainstreamed in sectoral and cross cutting programmes | Action to be included in revised BSAP |
| | A compilation of case experiences and lessons learnt in partnership with the GEF Small Grant Programme | UNDP has compiled success stories, experiences and lessons learnt emanating from its projects. | Compilation of success stories | To be widely adopted as a standard practice and included in the revised BSAP. |
| | A compilation of case studies contributing to the Global Biodiversity Outlook , the Strategic Plan and other publications | No progress | No change | To be considered for inclusion in the revised BSAP. |
| Global Taxonomy Initiative | Country-based taxonomic need assessment and identification of priorities. | Taxonomic need assessment conducted | No further actions initiated in light of the recommendations of the assessment | Will be assessed during revision of BSAP |
| | A widely accessible checklist of known species, as a step towards a global register of plants, animals, microorganisms and other organisms. | A searchable database of flora and animals of Pakistan established. | Database up and running, however requires refining | Further needs to be assessed during BSAP revision. |

| Cross-cutting issues | Relevant COP decisions, programmes of work, work plans, guidelines and suggested activities | National Implementation and contribution | Outcomes achieved | Future priorities |
|---|---|---|---|---|
| | Develop a coordinated taxonomy information system | No action | No change | Need to examined during BSAP revision |
| | Within the major thematic work programmes and cross cutting issues of the Convention, include key taxonomic objectives to generate information needed for decision-making in conservation and sustainable use of biological diversity and its components. | The project implemented so far did not include this objective | No change | Efforts will be made to include this objective in future projects |
| Global Plant Conservation Strategy | Plant diversity is well understood, documented and recognized | Plant diversity well documented and recognized | Use of information is made for conservation | More work to be done on characterization of habitats and ecosystems |
| | Plant diversity is speedily and effectively conserved | Most ecosystems and habitats included in PA system | A few PAs are well managed. Plans underway to bring more PAs under better management | Effective conservation outside PA system. |
| | Plant diversity is used in a sustainable and equitable manner | Medicinal and aromatic plants (MAPs) with commercial value, harvested unsystematically. Restrictions on trade of CITES species in place | Many initiatives underway to promote sustainable use of MAPs | Ensuring sustainable use and improving status of threatened and endangered species. |
| | Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on earth is promoted | People are aware of importance of plant diversity and its role in livelihoods | Tree plantation promotions held twice a year. Significant increase in plant growth on farm lands | Promotion of sustainable use of MAPs, and value addition to improve livelihoods |
| | The capacities and public engagement necessary to implement the strategy have been developed | Sustainable use of MAPs and other economic plants and value addition is focus of many projects and programmes | Many local level success stories | Expansion of the sustainable use and value addition of plants |

| Cross-cutting issues | Relevant COP decisions, programmes of work, work plans, guidelines and suggested activities | National Implementation and contribution | Outcomes achieved | Future priorities |
|---|---|---|---|---|
| Traditional knowledge, innovations and practices | Target: 18 Aichi Biodiversity targets | Communities are being increasingly involved in biodiversity conservation and sustainable use. Conservation plans are built on traditional knowledge and innovations. Ethno-botanic knowledge has been documented under various initiatives | Community based conservation initiatives have been increased and approaches are widely replicated | Extension of the approaches to fisheries and agro-biodiversity |