



## Country Partnership Strategy

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# Environment Assessment for ADB's Program in Afghanistan

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**This document is part of a series of background assessments, diagnostics, and discussion papers commissioned by the Asian Development Bank (ADB) to underpin the development of its new Country Partnership Strategy (CPS) for Afghanistan.**

**The findings, opinions, and recommendations contained in this document may not reflect those of the Asian Development Bank, but are posted to generate stakeholder comment and overall input into the CPS process.**

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## II EXECUTIVE SUMMARY

Afghanistan's natural resource base and environment has undergone extensive deterioration over the past two decades as a direct result of wars, political instability, intensive natural resource exploitation, and recent widespread drought that has affected many parts of the country. Environmental conservation has remained at a relative standstill since then and the exploitation of natural resources, in particular the country's meager forests, has continued unabated. The few government institutions that existed to conserve the natural heritage of the country were rendered ineffective by the military conflict, and remain critically weak. The lack of environmental protection combined with a burgeoning human population dependent upon a declining natural resource base has driven many species of plants and animals to the brink of extinction.

As detailed in the following assessment, attention must be given to the following:

- Support to the National Environment Protection Agency to build its capacity to deliver on its mandate.
- Quick action to encourage forest regeneration and replanting can help to restore ecological balance in critical watersheds while generating short-term employment opportunities.
- More attention needs to be given to renewable energy development, including micro and mini-hydro, solar, and wind power.
- Protecting Afghanistan's valuable bio-diversity, including through protected parks management and ecotourism
- Creative use of co-financing by ADB to catalyze additional funding for environment-related activities, as well as effective mainstreaming of environmental issues in all ADB-supported activities.

## I. Afghanistan's Environment

1. Afghanistan's population of roughly 23.5 million is largely dependent upon the country's natural resource base for its economic well being. These resources have been severely degraded as a consequence of past political instability and weakly implemented environment and resource management policies. To remedy the situation, both short-term measures to address immediate needs and a long-term plan will need to be developed and executed to rehabilitate and protect the natural resource base while providing the country's people with the means for their livelihoods through sustainable resource use.

2. Afghanistan is a landlocked country whose geography and natural resources share many characteristics with its Central Asian neighbors: Tajikistan, Turkmenistan, and Uzbekistan to the north; Iran to the west; and Pakistan and the People's Republic of China to the south and east (see Figure 1). Mountains dominate the central and eastern part of Afghanistan, covering about three fourths of the country. Extensions of the Hindu Kush Mountains cover the central and northeast parts of the country, with many peaks exceeding 6,000 meters (m) in elevation. The mountains are young, characterized by narrow valleys and steep rugged peaks; in a number of places the effect of glaciers are evident. To the west the mountains become lower and their slopes gentler, often turning into plateaus with the surrounding peaks protruding above them. In the north the topography is characterized by hot and arid northern plains as well as several high basins. The western and southern regions are dominated by desert ecosystems, the largest being the sand desert in Registan and the clayey-rocky Dasht Margo. Steppes form wide belts of intermediate elevation and receive an average level of rainfall—more than the dry lowlands but less than the wet highlands.

3. The sources of the country's rivers lie in the mountains, and water levels in the rivers vary greatly by season. The highest flows are in the spring and early summer fed by snowmelt. During the other seasons the rivers may become small streams or disappear entirely. Lakes are scarce. Those in the mountains are small, mostly of postglacial origin, while those in the desert are often highly saline and dry up in the summer.

4. A complex of five small lakes at Band-i-Amir, located in the Koh-i-Baba Mountains, is of exceptional natural beauty and has the potential to be an ecotourism site.

5. Land use in each zone is largely determined by the availability of water from precipitation, groundwater, or rivers. The natural vegetative patterns also closely follow the influence of water availability and altitude. In those river valleys with reasonably secure year-round water supplies, human settlements and irrigated agriculture are prevalent. As indicated in Table 1, the Food and Agriculture Organization (FAO) estimated in 1981 that 84% of land was used as rangeland (54.7 million hectares [ha]). Though there are no reliable current estimates of these figures, it is clear that changes have occurred over the past 25 years. Both irrigated agriculture and grazing activities would be expected to decline substantially because of damage to water delivery systems and loss of livestock during the period of conflict.

6. There are indications that agricultural area—particularly rainfed cultivation—has expanded at the expense of rangelands. Agricultural land use data from provincial records of the early 1990s that indicate a decrease in grazing area and increase in cultivated area. Deforestation in the past decade occurred at an alarming rate, especially in the eastern part of the country.

7. Afghanistan is endowed with a wide variety of vegetative types and habitats that contribute to its unique biological resources. Short-lived vegetation grows in the sandy semi-deserts, and salt tolerant vegetation is found in the salt semi-deserts. The most common trees found on humid soils are oaks, ashes, willows, poplars, planes, and fruit trees in orchards. Forests of the Himalayan type, including evergreen oak woods, grow in the borderland in the salt semi-deserts. The most common trees found between Afghanistan and Pakistan (in Nuristan and Paktia) grow at an altitude of 2,400 m above sea level. Pine, spruce, and cedar trees grow at 3,500 m, whereas alpine meadows extend even higher. The slopes of Tirbandi are covered with pistachio trees.

8. The fauna of Afghanistan is similar to that of other Central Asian countries. Beasts of prey, like the snow leopard, brown bear, wolf, striped hyena, jackal, and fox are still found in the mountains, though their populations are assumed to be in decline. Hoofed mammals are represented by the Marco Polo sheep, markhor, ibex, and others. Surveys have been conducted sporadically over the past 30 years, but there are no reliable current estimates of wildlife populations. Hunting and habitat degradation have decimated the indigenous fauna and flora of the country.

9. Management of the existing network of protected areas also is in disarray. Given the country's poverty, any efforts to generate sustainable economic benefits from these resources – through ecotourism or other means – will need to pay close attention to the needs and aspirations of communities living in and adjacent to protected areas.

## **II. SUBSECTOR NEEDS AND PERSPECTIVES**

### **A. Renewable Resource Management**

#### **1. Water**

No natural resource is more precious in Afghanistan than water, and water management systems throughout the country were severely damaged during the years of internal strife. As the country looks ahead to peace and prosperity, both rural and urban residents alike are looking first to the restoration of water management systems to support domestic supplies, irrigation, industry, and the natural environment. It is important that an overall planning framework be adopted that is based on the principles of integrated water resources management—taking into account the need to balance urban, rural, agricultural, industrial, and environmental uses—and preferably framed within a river basin context that considers both surface and groundwater resources.

Efforts are underway to identify the highest priority infrastructure investments for water management, and many of these are included in the assistance programs relating to water supply, sanitation, and agriculture. Though not all water uses are consumptive in nature, competition under conditions of chronically short supply found in Afghanistan can be intense.

The key water uses and concerns that should be considered are as follows:

- water supply, drainage and wastewater management in urban areas;
- rural water supply for domestic purposes;
- agricultural water use for various forms of irrigation as well as animal husbandry;

- generation of hydropower;
- water for large and small industries and associated wastewater treatment; and
- Water to support natural systems such as forests, rangelands, and wetlands.

The majority of Afghans do not have access to safe water, which together with a lack of sanitation and hygiene have serious consequences for the health and well being of the populace. Even before the period of conflict, only 8% of the country's settled population had access to safe water. As per Afghanistan's 2005 Country Report on the Millennium Development Goals, "More than half of all Afghans living in urban centers have no access to drinking water from improved water sources. In rural areas, it is estimated that 4 out of every 5 Afghans may be drinking contaminated water. Environmental degradation limits the availability of safe drinking water. Lack of access to clean water is often a cause of water-borne diseases".<sup>1</sup> Wastewater collection and drainage problems are particularly serious in urban areas, where sewage (and refuse) often is discharged directly into the streets. The 2005 MDG report indicates that only 1 in 3 Afghans in urban areas has access to improved sanitation. In rural areas, the situation is much worse, with only 1 out of 10 Afghans having access to improved sanitation.<sup>2</sup>

Several water-related issues are of special significance from a natural resource management perspective, including land degradation from poor irrigation practices, groundwater management, and hydropower development. Problems of salinization from poorly planned agricultural drainage schemes and inefficient on-farm irrigation practices should be avoided as irrigation systems are rehabilitated. The recharge rates of many groundwater aquifers are poorly understood, so their exploitation—especially through the use of tubewells for agricultural purposes—should be handled with care. There is evidence that many deep aquifers already are being depleted at unsustainable rates, and shallow groundwater resources are susceptible to pollution. Any efforts to develop the country's enormous hydropower potential through other than mini-hydropower schemes also will need to apply accepted international norms for environmental and social planning and protection such as those based on the recommendations of the World Commission on Dams.

Wetlands are another important "user" of river water that should not be forgotten in establishing sustainable rates of upstream water withdrawals. Many of Afghanistan's rivers have no outlet to the sea and drain into a series of depressions from which water is lost by evaporation. This results in the formation of large shallow saline lakes and marshes, which are biologically productive ecosystems of international importance for migrating and wintering water birds. These ecosystems also produce fish, down feathers, and reeds harvested by local populations and serve as important sources of income. Failure to take these values into account when competition has occurred for scarce water resources has led to the degradation of wetlands from low and increased salinity flows resulting in loss of natural habitat and subsequent elimination of wildlife species.

Another important consideration in the redevelopment of water management institutions relates to respect for traditional water resource rights at all scales—from the well or *karez* system (underground water channels) to the stream or irrigation canal and even to the level of the river basin. Special care should be taken to understand past, and often sustainable, patterns of water

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<sup>1</sup> Islamic Republic of Afghanistan. Vision 2020 – Afghanistan Millennium Development Goals Report 2005, Kabul, 2006. p. 81

<sup>2</sup> Vision 2020, p. 81.

resource use and allocation as the basis for introducing any suggested infrastructure improvements.

Traditional farming in Afghanistan has been practiced since historical times and provides the most efficient use of the limited water supply from glacial streams, springs, and *karez* systems, which are prevalent in the arid parts of the country. *Karez* systems comprise a network of wells connected through underground tunnels, and represent one of the most efficient ways of collecting unpolluted water. Only traditional technology is required to build them and they have low maintenance costs. The 3,000-year-old *karez* system is labor intensive, conserves water and soil, and creates a diverse biotic environment. This system has little adverse effect on aquifers, as the water is supplied by springs. However, the functioning of *karez* systems has been severely compromised in recent years by the bombing of mountainous areas of the country.

*Karez* systems and other traditional agricultural practices in Afghanistan conserve natural resources, while large-scale agricultural projects have created serious environmental problems such as the salinization of soils and drying up of major wetlands. In Afghanistan's arid environment, the few existing wetlands are of enormous value for maintaining a balance between development and biological diversity.

Afghanistan's territory is drained by three large river basins: the Amu Darya River Basin in the northeast, which flows into Tajikistan and Uzbekistan to the Aral Sea; the Indus River Basin in the east, which flows through Pakistan to the Arabian Sea; and the desert river basins that flow into lakes and marshes along the border with Iran in the south and southwest (streams only flow into the Pakistan province of Baluchistan during the spring and early summer). Of the eight principal sub-basins in Afghanistan, only three can be exclusively used by the country: the Southwestern Basin, which includes the Farah, Harut, and Kajrud Rivers among others; a group of small rivers in the north and northwest, including the Murghab and Balkhab Rivers; and tributaries to the Amu Darya before the river forms the border with Tajikistan.

The remaining sub-basins, including all the substantial perennial rivers in the rest of the country, are shared with neighboring countries. This raises issues of international transboundary water management affecting especially the Kunduz, Panja, and Kokcha Rivers in the north (flowing to the Amu Darya River and Aral Sea through Tajikistan, Turkmenistan, and Uzbekistan), the Hari Rud River in the west (flowing to Iran), and the Kabul River in the east (flowing to the Indus River through Pakistan). A water sharing agreement exists with Iran for the Helmand River, but nothing has been done in this regard for many years. There were also several agreements between Afghanistan and the now defunct Union of Soviet Socialist Republics (USSR) covering the Amu Darya River: the Frontier Agreement between Afghanistan and the USSR of 1946; and the Protocol between the Soviet Union and Afghanistan on joint execution of works for the integrated utilization of water resources in the frontier section of the Amu Darya of 1958. These agreements entitled Afghanistan to use 9 cubic kilometers (km<sup>3</sup>) of Amu Darya waters or about 13% of what is now estimated as the long-term average annual river discharge of 70 km<sup>3</sup>. Afghanistan currently uses about 2 km<sup>3</sup> or 3% of the average annual river discharge.

In time, international dialogue and institutional structures will be needed to deal with interstate agreements governing the use of these shared waters. Especially in the case of the Amu Darya Basin in the north, it may be prudent to open early communications with the Tashkent-based Interstate Commission for Water Coordination and the Amu Darya River Basin Authority (known as the BVO Amu Darya), which manage water allocation for the area of the Aral Sea Basin falling within the five former Soviet Central Asian republics. This would help address disagreements over water allocation as the irrigation systems of Afghanistan's northern plains are redeveloped.

Development of the balance of surface water will likely require some major storage investments that will affect transboundary stream flow patterns. Accelerated groundwater development will also reduce base flows of these rivers in the summer and fall seasons, which downstream users have recently come to expect. As pressure builds to expand water resource development in Afghanistan, these riparian issues concerning water sharing will have to be addressed to avoid costly delays and disagreements.

An estimated 99% of developed water resources are used for irrigation. Demands on surface water and groundwater resources are likely to grow substantially in the near term due in part to the large number of returning refugees and internally displaced persons (IDPs). Villages, towns, and cities will demand improved drinking water supplies as a high priority. Hydropower resources will need to be developed to meet energy needs in both rural and urban areas, and industrial development to expand employment will require reliable supplies of water. Domestic and industrial demands also may negatively affect water quality in the absence of effective monitoring and enforcement of environmental standards. Traditionally, village irrigation schemes were used to deliver water not only to crops but also to the village for domestic, livestock, and other uses. Many villages may be able to shift to better quality groundwater supplies, but this will require increased investment and far more vigilant management of groundwater recharge and groundwater quality. It is clear, therefore, that even if the development of remaining surface water resources for irrigation is deferred for the longer term, improved water resource management will be required in the short to medium term to overcome barriers and constraints to full recovery and sustained growth in the country.

Water conservation and harvesting is another area deserving immediate attention. This can be accomplished through soil, pasture, and vegetative and forest cover management; and construction of check dams, contour bunds, and other facilities to conserve water and enhance groundwater recharge in all watersheds. The wet season is short in Afghanistan (from December to April), and it comes at a time when vegetative cover is low and many areas are still covered by snow. Moreover, years of deforestation and conversion of pasture to rainfed cultivation (especially for growing wheat) have left much of the landscape denuded and degraded. Global experience has demonstrated in a wide range of arid environments similar to Afghanistan that water harvesting measures combined with pasture restoration and reforestation can improve water management; increase water available for drinking, livestock, and irrigated farming; and strengthen livelihoods and reduce vulnerability in a variety of ways. The resulting additional area of irrigated land, although small, is important in areas where water supplies are so scarce, especially when farmers irrigate high value-added crops such as nuts, fruit, fodder, and vegetables. Water harvesting measures are also very labor intensive and offer an important opportunity to generate short-term employment during the growing season.

Persistent droughts and the availability of donor financing have provided a stimulus to groundwater depletion by means of deep tubewells and in the process, resulted in a lowering of water tables. For example, the springs around Kabul that lie within their zone of influence have dried up. This is a serious and possibly catastrophic development for Afghanistan if it is not correctly managed. Not only does the country possibly lose important drought reserves, but water rights are illegally transferred from those who owned and used the spring or *karez* to those who are able to invest in the tube well. Until the Government is able to develop an effective monitoring and regulatory system for groundwater, it would seem sensible and prudent to develop and implement a monitoring program on an urgent basis in sensitive areas and to restrict and/or ban the expanded use of deep tube wells.

## 2. Forests

Traditionally, Afghanistan's tribes preserved forests and range resources through division of land use. However, the most significant and visible adverse environmental consequence of the conflict period in Afghanistan has been the loss of forest cover. Historical accounts show extensive forests in the region north of Kabul with relic patches of woodland existing in Istalif and Charikar, north of Kabul. In his 16th century memoirs, Emperor Babur gave an account of forests around Kabul. This suggests that vast areas of forest in various parts of the country have since been destroyed by overgrazing and cutting.

FAO and UNDP estimates in the early 1980s place the area of forests at approximately 2.2 million ha. From that time to 1991, the forest area declined from an already low base of 3.4% to only 2.6% of total land area or about 1.9 million ha. The latest estimates indicate that forest area stands at approximately 2% of the country's land area. As energy supplies were disrupted during the period of conflict, the cutting of forests for fuelwood accelerated. Many forests also were purposely cleared during the war years for security reasons, especially those adjacent to roads and other infrastructure. The deforestation process has now reached a stage where Afghanistan may face near total loss of its forest resources unless urgent and decisive conservation measures are taken.

The remaining forests of Afghanistan still provide a variety of environmentally and economically important services. From an environmental standpoint, they are crucial to watershed protection, and natural forests represent important indigenous ecosystems and habitats. Afghanistan's forests generate significant economic resources though largely non-market values associated with short-term flood protection, erosion control, aesthetics, and biodiversity conservation. The country's forests are also an important source of saleable timber and non-timber products, including fuelwood, charcoal, roots, and nuts.

Further loss of forest cover, primarily from steep mountainsides, will compound the problems associated with poor watershed management, including slope destabilization, soil erosion, and reservoir salutation. The management of Afghanistan's timber forests is thus of particular concern. Reports have cited pistachio forests being cut for firewood and stands of old growth cedar in the eastern provinces being felled for the lucrative export trade in timber. Furthermore, demand for both building materials and fuelwood has increased with population pressure, including the return of refugee populations, thereby threatening the remaining accessible forestland in the absence of external supplies.

As in the case of renewed water management efforts in rural communities, special attention will need to be given to understanding past, and often sustainable, patterns of forest resource use and allocation. While many traditional community-based systems of forest management were disrupted during the period of conflict, they deserve close investigation to reintroduce appropriate local incentives for sustainable forest management. There also is a legitimate and important role for the private sector to play in the country's forest resource development – particularly in establishing commercial forest plantations under appropriate environmental safeguards.

## 3. Rangelands

Pastures are estimated to cover approximately 40 million ha of Afghanistan's territory, or nearly 60% of the total land area, and animal husbandry produces an essential component of rural income. Prior to the extended period of conflict, approximately 15 million ha of lowlands and steppes were used for winter grazing, while 25 million ha of mountainous lands served as spring and summer pastures. The total carrying capacity of the country's current grazing lands for

different ruminants (sheep, goats, and cattle) has not yet been determined. In 1978/79, 40 million ha of pastures supported an estimated 25 million animals. Nomadic herding communities traveled long distances with their animals to exploit the spring and summer grazing lands in mountain ranges, returning each winter to the eastern and southeastern lowlands of Afghanistan and the border region with Pakistan.

To better understand both the land resource management challenges and economic potential of these activities, it is important that investigations and assessments be initiated soon on pastoral nomads, with particular emphasis on their migratory patterns, range utilization by domestic stock, and the specific implications for land resource management. Once again, traditional institutional arrangements within pastoral communities limited access to rangelands so that grazing levels were kept within the regenerative capacities of the land. Such assessments need to be examined and systems in place must be respected wherever feasible. Improving the productivity of pastures and returns to animal husbandry holds the promise of generating improved incomes for some of Afghanistan's poorest communities. As water, forest, and rangeland management are all closely interlinked, integrated approaches – perhaps within the framework of river basin management, when applicable – should be used to the greatest extent possible.

#### **4. Biodiversity/Protected Areas**

Afghanistan's position within the region where the Palaearctic and Oriental faunal realms intermingle highlights its zoogeographic and international importance, not only in terms of biodiversity and endemism but also for the occurrence of flagship endangered species such as the markhor (*Capra falconeri*), Marco Polo sheep (*Ovis ammon poli*), musk deer (*Moschus moschiferus*), snow leopard (*Uncia uncia*), and Siberian crane (*Grus leucogeranus*).

Afghanistan is home to some 441 bird species including numerous species of migratory waterfowl and waders that seasonally use Afghanistan's wetlands of Hamun-i-Puzak and Hamun-i-Helmand on the Iranian border, and Ab-i-Estada and Dashte Nawar for feeding, breeding, and rearing their young. Dashte Nawar at 3,210 m elevation is the highest breeding area in the world for the greater flamingo (*Phoenicopterus ruber roseus*).

Among Afghanistan's 250 mammal species, there are also many exotic forms that include the caracal cat, leopard, lynx, goitered gazelle, Siberian ibex, urial, and wild goat to mention but a few. A number of the ungulates, in particular the Marco Polo sheep, markhor, and urial, are transboundary species that have seasonal movements to and from Afghanistan and neighboring countries. Their rational utilization and conservation in Afghanistan is vital in terms of maintaining global biodiversity and a healthy state of the regional environment.

Northern Afghanistan forms part of the center of plant diversity for the mountains of middle Asia. In addition, there are many other interesting plant communities in the country, but many have been depleted during the war years. For example, wild pistachio (*Pistachia*) and almond (*Amygdalis*) woodlands have been severely degraded. The maintenance of their gene pool is essential if these species are to be utilized to improve domesticated varieties. The holly oak, cedar, pine forests, and remnant juniper forests of Nuristan and Laghman have undergone unmonitored exploitation in areas close to roads. However, roads penetrate only the periphery of these forested areas, and reliable sources in Afghanistan report that montane forests in these provinces are still in good to pristine condition in the hinterlands. Forests of Paktia Province have perhaps been the most seriously affected during the war and subsequent anti-terrorist activities that are still ongoing. Until the security situation improves, it is unlikely conservation activities can be expanded into this border province in the short term. Among the many important economic plants in the country, cumin (*Carum bulbocastanum*) is one of the principal spices that are exported internationally. The

valleys of Badakhshan produce the highest quality cumin in the world and the seeds of this herb have been exported along the ancient Silk Road trade route for thousands of years.

Prior to more than two decades of civil conflict, sustainable use of wildlife resources was being actively practiced by the Afghan Tourist Organization (ATO), one of the primary government agencies active in conservation of natural resources through a tourist hunting and trekking program. For a number of years, ATO had been conducting a hunting program for Marco Polo sheep and ibex in the Big Pamir Mountains in the western part of the Wakhan Corridor. Besides substantial economic returns (12 adult male wild sheep were hunted annually at a cost of \$16,000 per sheep), local people were substantially involved in the hunting program by providing guides, hunters, porters, pack animals, and foodstuffs for which they received considerable economic benefits, besides secondary benefits of medical assistance, clothing, and school supplies for children. The result was that a large reserve of some 68,000 ha, a former royal hunting reserve, was maintained and honored by the local communities where grazing of domestic animals was limited, thus maintaining the natural environment for near exclusive use of wildlife.

Alexander the Great and Ghengis Khan, two of Asia's most noted conquerors, failed in their efforts to introduce limited hunting "legislation" among the tribes of ancient Aryana. Modern Afghans are no more agreeable to hunting restrictions than were their forebears. However, survival of the Afghan fur industry depends on the maintenance of adequate stocks of wild predators. To achieve a sustained yield, there must be decreases in the annual kill. Since no hunting legislation exists, these problems could be approached from the marketing end. This can be most effectively achieved by placing an outright ban on all fur exports, clamping down on smuggling, and making it illegal to sell furs of endangered species, including snow leopard, lynx, Blandford's fox, the yellow throated marten, Asiatic cheetah, and caracal.

International involvement in Afghanistan's conservation efforts was initiated in 1971 with independent wildlife conservation studies and efforts centered in the high Pamir Mountains of the Wakhan Corridor. The researchers were subsequently employed by ATO as wildlife consultants and for two years conducted reconnaissance wildlife surveys over much of Afghanistan. The objective was the possible expansion of conservation efforts in the country through community participation in an expanded tourism program focused on sustainable wildlife utilization and other ecotourism programs. Subsequently, the World Wide Fund for Nature (WWF) funded additional studies of the Tulibai Valley in the Big Pamir Wildlife Reserve surveys, particularly for the greater flamingo, Siberian crane and other waterfowl and water birds in Ab-i-Estada and Dashte Nawar in Ghazni Province.

These efforts and further interest of the Government in expanding its conservation program led to the initiation in 1974 of the UNDP-funded and FAO-implemented Conservation and Utilization of Wildlife Resources Project. Its goals were to ensure conservation and effective management of the country's spectacular and valuable wildlife resources and habitats and to stimulate tourism by establishing a system of national parks and wildlife reserves representative of the various ecological zones of Afghanistan.

The project continued for the following 6 years until political instability and security issues caused its demise. During that time, the Forest and Range Management Department of the Ministry of Agriculture and Irrigation was appointed the responsible authority for wildlife and protected areas management and took a leading role in furthering conservation efforts. It became the major government agency co-directing the UNDP/ FAO project. The Department directed expanded efforts in wetland conservation and through the project took the lead in conducting additional conservation work in the forested areas of Nuristan and Laghman, the Hazarajat and Pamir Mountains, Hamun-i-Helmand, and the Puzak wetlands on the Iranian border, among others.

Twelve sites and an additional three cultural heritage sites were identified as potential components of Afghanistan's protected areas system, covering a range of ecosystems, covering a range of ecosystems from the high mountains and forested areas in the eastern part of the country to the wetlands of the southeast and central parts of the country. Additionally, in 1973 ATO succeeded in securing government approval for Afghanistan's first national park in Bandi-Amir (41,000 ha), and in the same year, the country also acceded to the Ramsar Wetland Convention.

After 1979, all Afghanistan conservation work came to an abrupt halt and plans for an expansion of the nature reserve system in Afghanistan could not be realized. Afghanistan's natural resource base and environment has undergone extensive deterioration over the past two decades as a direct result of wars, political instability, intensive natural resource exploitation, and recent widespread drought that has affected many parts of the country. Environmental conservation has remained at a relative standstill since then and the exploitation of natural resources, in particular the country's meager forests, has continued unabated. The few government institutions that existed to conserve the natural heritage of the country were rendered ineffective by the military conflict. Traditional conservation knowledge has been on the decline and a massive exodus of professionals from the country has left Afghanistan with few environmental specialists or experienced technocrats to implement conservation activities.

Presently, the lack of environmental protection combined with a burgeoning human population dependent upon a declining natural resource base has driven many species of plants and animals to the brink of extinction. Despite an international ban on the trade, pelts are sold openly in stores in Kabul. There are estimated to be fewer than 100 snow leopards left in Afghanistan and about 3,500 in Central Asia. Afghans faced with drought that has gripped the country for the last four years have resorted to killing the snow leopard's prey. Hunters are also selling the bones of the snow leopard for their alleged aphrodisiac and healing properties in Chinese traditional medicine. Policy should be urgently enacted banning the sale of the pelts. Communities in snow leopard habitats should be provided incentives and empowered in their traditional role of guardians of their lands.

Seventy-five species of animals and plants found in Afghanistan have been placed on the IUCN Red List with 35 species of animals listed as either vulnerable or endangered. The total number of threatened species is certainly much higher, as essentially no wildlife research has occurred in Afghanistan in many years.

The Government ratified the Convention on Biological Diversity on August 15, 2002. Apart from the assessments mentioned above and some collaboration with the International Board for Plant Genetic Resources concerning documentation of local grain varieties, it has been many years since the country has actively engaged itself in global or regional cooperation relating to biodiversity conservation and protected parks management.

## **5. Desertification**

By many accounts, the process of desertification is already advanced in several areas of Afghanistan's arid north, west, and south. The resources severe drought of the past four years has been exacerbated by the adverse effects of the conflict on resource management patterns. The near total lack of data indicating trends in land conditions makes it extremely difficult to assess the locations and degrees of threat represented by this phenomenon. Nevertheless, the topic deserves special attention as environmental management efforts in the country begin in earnest. Afghanistan signed the Convention on Combating Drought and Desertification in January 1995.

## 6. Pollution and Environmental Health

Urbanization in Kabul and Herat – and to a lesser extent in Mazar-i-Sharif, Kandahar, and other cities – is currently taking place in an almost totally haphazard fashion. This disorganized process is making it virtually impossible for the municipalities to plan for and provide even the most rudimentary environmental services, such as solid waste management, drainage, protection of groundwater supply and quality, household and commercial wastewater management, piped water supply, air pollution control, and urban zoning or land-use planning.

Solid waste management has come almost to a standstill. Disruptions from the war, including damage to collection trucks, and a lack of funds for workers' salaries and fuel has brought the system to near collapse in most municipal settings. In Kabul, for example, garbage is being disposed of in informal dumps around the city, and there is only the most rudimentary collection service. Some government agencies and NGOs have been assisting by providing fuel or food in exchange for work by municipality laborers, but this system is not sustainable in the absence of a direct cost recovery mechanism or some other source of municipal revenues.

Issues relating to water resources management, including some of those associated with urban and industrial use, already have been discussed. Where the infrastructure of municipal water supply, drainage, and wastewater collection and treatment existed prior to the conflict period, it generally is in need of rehabilitation. In other areas such infrastructure must be planned and built for the first time. Such measures should greatly reduce the prevalence of health problems from water-borne diseases. This should be of high concern, since Afghanistan has one of the highest child mortality rates in the world—primarily because of diarrheal diseases. Though it will be challenging under the economic conditions prevalent in Afghanistan, it will be advisable to follow full cost recovery and user pays principles wherever feasible (while still ensuring that water is available to meet the basic needs of the poor) so that neither the national nor local governments become saddled with high recurrent costs for operation and maintenance of water-related services.

Outdoor air pollution is increasing in Kabul and several other urban areas, largely from vehicular emissions. Kabul's air quality problems are exacerbated in the winter months when the city is prone to atmospheric inversion. Programs for the management of traffic flow and control of vehicular emissions need to be established in advance of the increased traffic that will come with redevelopment. Indoor air pollution also is a potential source of health problems, especially associated with stoves used in the winter months when there is poor ventilation indoors. It is as much a rural as urban phenomenon, though the latter can be expected to decrease as kerosene and other fuels become more widely affordable in urban areas. As stated earlier, Afghanistan ratified the UN Framework Convention on Climate Change (UN FCCC), bringing the country into international dialogue and enhancing the possibility of grant resources being made available for simultaneously addressing local air pollution problems and greenhouse gas emissions.

As noted, urban zoning or land use planning is virtually non-existent. The influx of refugees has created enormous pressures on cities to provide adequate services, and this is made even more difficult by the lack of spatial planning or enforcement of even rudimentary zoning requirements. For example, encroachment on fertile agriculture lands immediately adjacent to cities is threatening to drive up the cost of providing urban areas with food supplies, reducing green space and displacing an important source of sustainable income and nutrition, especially from production of high value crops such as vegetables. Careful attention also should be given to the location of industries, with the preferable approach being to co-locate those with similar waste products – particularly small and medium-scale enterprises – so that they can cooperate in waste reduction or

treatment measures. Also, companies can be co-located to promote waste exchange—in which the by-product of one company is used as an input to another company.

The mining and energy sectors also present special environmental management challenges. As these sectors are redeveloped, care must be taken to ensure that a wide range of exploration, exploitation, and distribution options are considered to minimize adverse environmental impacts. Oil, gas, coal, marble, and other mining activities as well as pipelines and hydropower dams can bring significant economic benefits to the country, but this should not be done at the expense of social, cultural, or environmental concerns. Afghanistan acceding to the UN FCCC also opens up new possibilities for development of greenhouse gas reduction activities under the Clean Development Mechanism in the energy sector. This may offer additional incentives for the essential development of renewable energy resources such as the establishment of sustainable fuelwood lots and use of other biomass energy sources as well as solar power, wind power, microhydro, and biogas options.

### **III. NEED FOR ACTION**

#### **A. Establishing Capacity for Implementing Environmental Safeguards**

The Environmental Management Act was promulgated in August 2006 to provide for the sustainable use and management of the country's natural resources and the conservation and rehabilitation of its environment in order to (i) protect human health; (ii) improve livelihoods; (iii) maintain ecological functions and evolutionary processes; and (iv) facilitate the reconstruction and sustainable development of the national economy.

The Act established the National Environment Protection Agency (NEPA) to protect the country's environmental integrity and promote sustainable use and management of natural resources and conservation and rehabilitation of its environment through the provision of effective environmental guidance and management services. NEPA's mandate includes (i) developing and implementing environmental policies, strategies and legislation in order to integrate environmental issues and sustainable development approaches into the legal and regulatory frameworks of the Government and (ii) providing environmental management services in the areas of environmental impact assessment, air and water quality management, waste management, pollution control and permitting of related activities. Similar to other Governmental agencies, NEPA is institutionally very weak and needs long-term assistance to build its capacity for it to deliver on its mandate.

#### **B. Environmental Management Capacity Building Needs Assessment**

A broad-based needs assessment has been conducted to evaluate the current capacities of all government agencies, private sector, NGOs, and academic institutions with respect to environmental and natural resource management skills and experience by various organizations including ADB. The subject areas to be assessed include the gamut of topics covered in this report, including resource sectors (water, forests, rangelands, biodiversity), pollution management, cross-cutting topics (e.g., climate change, desertification, community participation, and environmental monitoring), and analytical fields (such as environmental economics, conservation sciences, environmental impact assessment, spatial analysis/GIS, and gender analysis).

The assessment identified opportunities for capacity building activities and ADB focused its efforts in environmental impact assessment, air quality, renewable energies and protected areas. However, it is critical that support be provided in development of undergraduate and graduate programs in ecology, conservation, resource management, and other areas related to scientific

needs in sustainable development. Such support will include the provision of limited quantities of appropriate research materials and upgrading the research library with books and journal acquisitions.

### **C. Sustainable Forest Management**

A preliminary analysis of the state of the nation's forests and the principal factors contributing to their degradation should be conducted. Recommendations for their sustainable management should be derived within an appropriate policy and institutional framework. These recommendations will pay particular attention to the identification of collaborative forest management opportunities capable of enhancing the sustainable livelihoods of communities living within or adjacent to national forests. This effort should be coordinated with the emerging investment agenda with respect to forest sector rehabilitation and watershed management, as well as policies governing water, rangelands, and protected ecosystems. Carbon sequestration options that may offer Afghanistan the chance to generate greenhouse gas emission reduction credits also be explored. Special attention should be given to finding proper balance between the roles of government entities, the private sector, and forest-based communities with due consideration to traditional patterns of sustainable forest management in Afghanistan that may be revived. Pilot demonstrations of promising social forestry and agroforestry forest regeneration and management approaches should be designed and may be supported as part of this activity. Quick action to encourage forest regeneration and replanting can help to restore ecological balance in critical watersheds while generating short-term employment opportunities.

### **D. Renewable Energy Development**

In most countries, rural electrification usually refers to the last few percent in the too remote, too poor, too distant, too hard category. In Afghanistan rural electrification is mainstream; only 6-10% of the population has access to clean commercial energy, and 20-22 million people, around 2.5 million households still need service. Most of these are the 80% or more of the population that is classified as rural. Many are very remote. More attention needs to be given to renewable energy development, including micro and mini-hydro, solar, and wind power.

### **E. Environment and Economic Growth**

In the Afghanistan context, some options for diversification of employment and increasing incomes are:

- adding value to existing agricultural and livestock products; crop drying, improved packaging and presentation, improved processing and presentation of wools, skins, cotton and other textiles, apparel and footwear, animal-based toiletries such as soap making,
- improving quality of forest products such as papers and boards that are currently imported,
- improving the quality and value of handicrafts which feature heavily in the "carpets" export category (Fig.3); better spinning, weaving and dyeing, improved tooling and finishing of wooden and metal artefacts,

- Developments of services, which contribute most to GDP though at present relatively little to employment, especially such activities as IT and tourism which may attract export income.

All these economic activities are energy-dependent or energy-enhanced. Most are suitable for small-to-medium scale enterprise development, easily decentralised, and potentially providing the diversified employment the country needs.

Socially productive uses of power are equally important, and often require very small amounts of power to achieve startlingly improved results. Lighting in schools obviates the need to close the school when the weather is bad and the natural light is poor. It also permits running school shifts, for example to hold adult literacy classes at night, thus improving the return on physical investment in the school buildings. Small incremental amounts of power permit vast curriculum enrichment by allowing use of electronic media. This is a tremendous advantage in a country where teachers are in short supply. Only small amounts of power are needed for science laboratories and simple experiments, and would help to build science and technology capacity in areas critical for the country's development.

Afghanistan is rich in renewable energy resources. The mountains of the country, particularly in the north, offer tremendous untapped hydropower potential, though environmental and social safeguards would need careful application if it is to be developed. In the southeast and southwest, wind resources are abundant. Given the extent of desert lands and remote communities, the country as a whole also has one of the world's highest potentials for tapping solar power. Biomass is traditionally used throughout the country as an energy source largely in the form of fuelwood, charcoal, and animal wastes. It is anticipated that pressures on the nation's limited power generation capacity as well as deforestation can be reduced through the development of alternative energy sources.

## **F. Protected Areas Management**

The natural wildlife heritage of the country is also under threat. Flamingos have not been bred successfully in Afghanistan for a number of years, and the last Siberian crane was seen in 1986. While the Wakhan corridor contains healthy populations of endangered snow leopards and other mammals including Marco Polo sheep, active hunting is occurring in many regions of the country, either for sport, for meat, or in order to supply furs for sale to foreigners in Kabul. The legal status of all protected areas is currently in questions and no management is taking place to protect and conserve their ecological integrity and wildlife. Furthermore, less than 1 per cent of the land base is contained within protected areas – none of which cover the dwindling conifer forests of the east. ADB has undertaken considerable work in the designated Bandi-Amir national park, one of the most beautiful landscapes in all of Afghanistan. This national treasure has all of the characteristics of a World Heritage Site, and could become an important destination for nature tourism with both proper management and community support.

Though Afghanistan's parks and protected areas are currently in a state of almost total neglect, there are some candidate sites for incorporation into a national system. Investments in the rehabilitation of watersheds and forest areas are expected over the next few years, and these should be carefully coordinated with renewed attention to parks, reserves, and wildlife sanctuaries. Assuming that the Government signs and ratifies the Convention on Biological Diversity, this will open up the country to full regional and global cooperation in this sphere. Once peace returns to the country, there is potential for developing trekking parks of international significance such as those in Nepal, India, and Kenya. The revenues generated from visitors can contribute to the

conservation and effective management of the country's spectacular wildlife and scenic resources as well as supporting local communities around these areas.

### **G. ADB Programming**

The gap between the Government's environmental commitments and development partner-funded upstream work has not been bridged. Under-funding by the Government of environment related activities continues, and application and enforcement of legislation is weak. ADB needs to continue to approach environmental management as a key cross-cutting theme. Projects with discernible negative impact on the environment have not taken place and there is the need of improving the understanding of environmental repercussions of ongoing or proposed activities.

ADB grant resources likely to be available for environmental management objectives in Afghanistan for environmental management objectives are relatively modest compared with those of some of bilateral agencies. The avenues for ADB to pursue are to (i) step up technical and loan co financing efforts involving bilateral, JFPR and GEF; and (ii) shape the design of technical assistance and investment projects in ways that provide a maximum overlap between objectives of livelihood improvement and environment, such as projects possibly formulated for GEF co financing.