وضعیت محیط زیست افغانستان
فشارها، پیشرفت ها، چالشها و خلاها

The Environment of Afghanistan
(2010 - 2017)

Pressures, Progress, Challenges/Gaps

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Dec. 2017

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حوت 1396

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List of Abbreviations

ADB	Asian Development Bank
AEP	Alternative Energy Promotion
BSP	Biogas Support Program
BSP	Biodiversity Support Program
CADEC	Community Awareness Development Center
CSI	Central Bureau of Statistics
CDM	Clean Development Mechanism
CDC	Community Development Council
CES	Center for Energy Studies
CP	Cleaner Production
CRE	Centre for Renewable Energy
DCS	Development and Consulting Services
DDC	District Development Committee
DNR	Department of Natural Resources
DFM	Department of Forest Management
DRM	Department of Rangelands Management
DRED	Department of Renewable Energy Development
EE	Energy Efficiency
ESCO	Energy Service Company
EV	Electric Vehicle
GDP	Gross Domestic Product
GDI	Gender-related Development Index
Gg	Giga gram (1 Gg = 1 kilo ton)
GHG	Greenhouse Gas
GJ	Giga Joule
GTZ	German Agency for International Technical Cooperation
GWC	Global Warming Potential
HDI	Human Development Index
HPI	Human Poverty Index
ICS	Improved Cooking Stoves
INPS	Integrated National Power System
IOE	Institute of Engineering
JICA	Japan International Cooperation Agency
KfW	German Development Bank
kW	Kilowatt
kWh	Kilowatt hour
KU	Kabul University
LCC	Lifecycle Cost
LPG	Liquefied Petroleum Gas
MHP	Micro-Hydropower
MRRD	Ministry of Rural Rehabilitation and Development
MoM	Ministry of Mines
MoCI	Ministry of Commerce and Industries
MOF	Ministry of Finance
MAIL	Ministry of Agriculture, Irrigation and Livestock
MoLSA	Ministry of Labour and Social Affairs
MoTNA	Ministry of Transport and National Avian
MEW	Ministry of Energy and Water
MW	Megawatt
NEPA	National Environmental Protection Agency
NGO	Non-governmental Organization
I-NGO	Int. Non-governmental Organization
NSP	National Solidarity Program
O&M	Operation and Maintenance
PV	Photovoltaic
R&D	Research and Development

RE	Renewable Energy
REDP	Rural Energy Development Program
RET	Renewable Energy Technology
SEA	Save the Environment-Afghanistan
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United Stated Agency for International Development
WB	The World Bank
WCED	World Commission on Environment and Development
WTO	World Trade Organization

Forward

People's priorities and therefore, perception of "environment" depends to a large extent on their situation along the path of development from poverty to affluence. For the majority of people in Afghanistan, degradation of environment is seen and felt in terms of the struggle to meet the basic needs at the household and community levels. Many people feel that environment is a matter of choice, and their views of the environment is the God given gift to use it. While, understanding the environment in the spirit of "**HOLY QURAN**" and "**SUNNAH**" is that; Allah Almighty has given us all good things free and in abundance and one would not be able to count them if he intends to do so, if we are grateful to Allah, Allah Almighty will add more for us and if we show ingratitude, the consequences will be dreadful indeed. In all these things there are signs of "God Almighty's Hekmat" for those who consider and look into them with true spirit of faith and reverence.

In my capacity as a professional environmental practitioner, during my 24th years of practices[1] in Afghanistan, I found that people can be key asset for "environmental degradation and environmental protection". There has been good number of best practices that has to learn from the people and lay it into ground. The choice of environmental protection is an integrated religious, traditional and modern knowledge. It depends on the understanding of those who proceed with the practices.

Rich biodiversity, lofty mountains and picturesque landscapes are major uniqueness of Afghanistan, and the biodiversity is an important renewable natural resources. Climatic variations from lowlands to upper landscape is a natural values adds to the value. Rainfall increases from west to east, and vegetation ranges from desert in the south and west to steppes and dry woodland in the central and north to coniferous forests in the humid mountains along the south and southeast border.

This report presents the endeavors, progress, pressures, gaps, challenges and the environmental governance in Afghanistan. Good opportunities have been gained and many have been missed due to negligence and good governance.

I wish to acknowledge almost all NEPA and technical partner colleagues, who's efforts brought about possible changes in all aspects of environment and ecosystem protection throughout the country. I also wish to thanks all individuals and entities who provided assistance of significance during the past years period in which this study was completed.

First and foremost, we wish to recognize the continuous input throughout the period of this report of all provincial directorates of NEPA who provided inputs. Therefore, colleagues of UNEP, UNDP, WCS, ADB, EU and other's efforts are closely connected to this report.

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[1] Malikyar 1989-2017). Five years of worst situation (1991-1996) has been excluded.

Key Issues

1. Urban and rural environment suffer from adverse impacts of various activities
2. Urban air pollution is rapidly increasing in Afghanistan. Households, municipal activities, small scale Industrial enterprises and transport are major sources of pollution, as well as deforestation, land, water and forest degradation
3. Municipal solid waste poses risks for human health as well as water quality in urban areas.
4. Significant increase in extreme weather patterns are also underscores the need for resilience initiatives and better disaster management.
5. Deforestation continues to threat biodiversity, adding to greenhouse gas emissions, and undermining ecosystems.

Afghanistan's Major Environmental Assets

Afghanistan's major environmental resources are land, water, forest, faunal and floral bio-diversity. These are substantial asset of natural heritage that has been ignored for centuries. Many of today's most pressing problems both have national, regional and global impacts and requires regional and global solutions as well. As part of world member, Afghanistan contribute to global environmental degradation as the impact of human activities is growing day by day. Comparing to its total geographical area, Afghanistan is a densely settled land with 37 inhabitants per km2 and faces rapid population increase. The average Afghan consumes manifold less as much energy as is used globally.

Degradation of environment as an obvious factor from negligence, war and conflicts to poverty and lack of awareness at all level are apparent. In the past few years from Transitional Government to stable administrative systems, a number of initiatives for environmental protection were initiated that has not been sufficient in a country that most of its time spent in war and internal conflicts. These factors necessitate an urgent need to revive the environment, biodiversity, and natural resources, that were established nearly a quarter of a century ago and, by enhancing the quality of life of communities in the rural, mountainous, ecologically areas and buffer zones. The government is committed to pursuing a path of broad based and participatory growth strategy with a strong commitment to reducing poverty.

Community development programs through various initiatives have had its impact on the livelihood in one hand, but the pressure on environment and ecosystem has been ever growing. Lessons-learned that programs that can reduce these pressures should be focused to the greatest extent possible on a scheme of co-operation and collaborative management for mutual benefit of both the human population and the areas of biodiversity assets. There are many traditional bases for this form of collaboration that may build upon, while respecting the tenets of Islam, cultural and tribal traditions. The major developments and trends in terms of environmental resources and associated socioeconomic driving forces and pertinent significant environmental issues are described below.

1. Introduction

Situated in central Asia, Afghanistan is a landlocked country of 652,864 sqkm, that shares borders in the north to central Asian republics of Uzbekistan, Tajikistan, and Turkmenistan, Iran in the west, Pakistan and China in the south, southeast and northeast. The geographical features of the country including its landlocked nature, mountainous terrain, large desert area, limited cultivated land and scattered resources, often isolated human settlements render economic development of the country costly and difficult. The country eventually rises from the hot arid plains along the Amu Darya and the Seistan Basin (400m altitude), through mountain ranges of the central and northeast, where many peaks exceed 6,000 meters to mount Zebak and the highest points in the Pamirs at 7,484 meters[2].

The central and eastern part of the country consists of mountains, rivers and green valleys

[2] Geography of Afghanistan

within the mountain slopes, wide desert in the west and southwest and form unique characteristics of the country. Mountains cover ¾ part of its total area. This range joins the Himalayan and western Asian ranges[3].

Geographical structure of Afghanistan within the mountain ranges, plain and sandy desert causes change in climate. Generally the climate is dry and makes variation in temperature of the day and night time. Afghanistan has a semi arid steppe climate with cold winters and dry summers. The Indian monsoon rain influences a narrow belt in eastern Afghanistan and allowing development of variable forest. The annual precipitation ranges from 100-1000mm. The seasonal distribution of precipitation is of the Mediterranean type, generally in the spring and dry period of the five months in summer. The temperature regime is of the continental type, with hot characteristic. Afghanistan is rich in climatic diversity which is mostly dependent on temperature regimes that varies sharply with altitude (vertical zone). The moisture distribution varies with aspects, that the southern slopes appearing drier and less vegetated than the northern slopes. In addition, the distribution of snow, ice glaciers and location of isolated peaks, lakes and valleys further modify the local climate to form climatic diversity on micro-scale. Such a complexity of climate and soil have produced an equally divers ecosystem with equally diverse flora and fauna as well as ecological processes. It is imperative that such diversity be preserved.

2. Physiography

The main physiographic regions of Afghanistan are:

1. The desert region (500-1000m elevation) of Dash-e-Margo, a desolate steppe with salt flats and Registan desert covered by windblown sand on the southwestern side of the HinduKush mountain range.

2. The steppe and semi-desert region (900-1800m elevation) between the desert and central highlands on the southern portion of the HinduKush mountain range

3. Central highlands (2000-7000 m elevation), part of the great Alpine-Himalayan mountain chain. This region covers an area of approximately 256,000 sqkm. Most of the forests of Afghanistan is located in this region.

4. The semi-arid plains along Oxus river (300-400m elevation) on the north side of the HinduKush, part of the central Asian steppes. This region covers an area of approximately 6,400sqkm.

5. The sub-tropical region (400-1200m elevation) of the eastern part of Afghanistan

[3] (The Asia's physical map indicates that the central Asian mountains are the highest peaks in the world of which the eastern ranges are higher than the western tip and laid westward).

3. Population and Population growth

Central Statistic Organization of Afghanistan reported that the current population of Afghanistan is around 29.7 as of Thursday August 17, 2017, equivalent to 0.45% of the total world population. Afghanistan ranks number 40 in the list of countries and dependencies by population. The population density is 52 per Km2 (135 people per square mile. The annual growth rate is estimated 2.4%. Median age is 17.8 and total fertility rate to be 4.49% (the highest in south Asia/ 3.3%). Urban population is 27% and rural population has estimated 73% with 1.5 million nomadic families. The ratio of male is 51 and 49 female. The almost 4 decades of war left 3.3% of women as household heads. The high ration of growth rate, fertility and dependency has been core constraint of economic growth. The population growth rate indicates a double increase since last census in 1979 (13.05 million). High fertility rate (6.3 %), number of life rate per women) links to different factors including traditional preference for large families because children seem to be sources of income. 50% of total population is lower than 15 yrs.

Around four decades of war, not only threatened the live and livelihood of population in Afghanistan which is culturally highly diverse, with around 20 distinct ethnic groups, but also, curtailed the country to access to some very primary living asset including electricity and alternative energy. Some groups tend to occupy particular areas of the country, while others are more scattered, or mainly urbanized. Traditional tribal rivalries are an important factor in social relationships, and the diversity of ethnic groups is reflected in the current composition of the current Islamic government of Afghanistan. The two principal languages are Pashtu and Dari. Afghanistan is a Muslim country with the majority Sunni and most of the remainder Shia.

Pashtuns make up the largest single ethnic group. Living mainly in the wide belt of land south of the Hindukush and have since the 18th Century, tended to be the dominant element in national governance.

4. General Education and Environmental Education

There are over 16,000 schools in the country and roughly 9 million students. Of this, about 60% are males and 40% females. Over 174,000 students are enrolled in different universities around the country. About 21% of these are females. It has been proposed that construction of 8,000 schools are required for the remaining children who are deprived of formal learning. The National Environmental Protection Agency of IRA, together with Ministry of Education completed the first environmental education curriculum in 2011 and thought in schools to promote transfer of environmental awareness program to the families of school student.

Beside government universities, there are a number of private universities in Afghanistan that follow the confirmed curriculum by Ministry of Higher Education as formal education system. Integration of environmental subjects into such curriculum has positive response. Efforts have been made to maintain long term environmental capacity through setup of faculty of the environmental science in structure of the Kabul University, established in 2012. Moreover, a number of environmental departments have been initiated in universities especially specialized faculties of Kabul University, Polytechnic University, University of Balkh, Hirat and Nangarhar.

Environmental lectures have been seconded to the National Military Academy of Afghanistan, Academy of Police, and other military institutions to ensure that the graduates have sufficient knowledge of environmental protection and deals with different environmental cases when assigned in different parts of the country. Plan of initiation of environmental department into other major universities outside of Kabul, including Kandahar University in the south, Kunduz University in the north, and Khost University in southeast. Major training workshops for school teachers have been initiated throughout the country and it will a continual program.

Since literacy rate of the entire population is extremely low of 38.2% (males 52% and females 24.2%), environmental awareness through mass media especially televisions and radios have been an important channels. Fortunately, the country has registered good number of visuals and wide ranging sound medias along with good coverage, that help to promote public awareness programs. While minor, but the National Environmental Protection Agency of Islamic Republic of Afghanistan (NEPA) seriously follows coordination and engagement of these channels in environmental awareness.

Moreover, a plan to develop a simple syllabus in national literacy program, using traditional and Islamic knowledge of environmental protection. The process will also follow the literacy programs of Afghan National Security Forces, which has been a mandatory literacy courses. In addition, private TV channels especially ARIA TV for Children play significant role in children learnings. In the meantime, Baghch-e-Simsim by Tolo TV, Ariana TV children program (Parwana Ha/ Kala Khina Yee), and others serves as a means to attract Afghan children into environmental learnings.

5. Socio-economic Process and Environment

Although, there have been extensive obstacles, considerable progress has achieved in social sector in the past twelve years:

a. double in school enrolment with more than 5 million children admission,
b. high proportion of female enrolment of around 35%
c. increase in awareness of urban in rural population in relation to environment and ecosystem
d. environmental employment in rehabilitation, development and other projects in rural and urban areas through various public and private sector, while limited, but in extended manner.
e. Substitution of solid and polluter fuel to clean fuel in government ministries, institutions and even in urban security sector has left tremendous

As most mountainous country, Afghanistan lays in the middle portion of Asia and mountains and valley ecosystem serves as added value to it. Despite the country is home to approximately 29.2 million, there has been flow of returnees, military operation and per capita scattered waste production, release of substantial hazardous gas and increased machinery utilization for different purposes, have created ever increasing pressure on environment and the natural wealth of the country. The population in metropolitan Kabul is approximately 3.9 million (Afghanistan Statistical Yearbook 2016).

6. Health and Sanitation

It would not be realistic to say that access to health, nutrition, clean water and sanitation as basic human rights has not been obtainable in many parts in Afghanistan in the past three decades and at present, which is taking gradual improvements. In line with HDI, health sector is yet to be unsatisfactory, but slowly improving. The Ministry of Public Health oversees all matters concerning the health of Afghanistan's population. According to the Human Development Index, Afghanistan is the 15th least developed country in the world. Its average life expectancy at birth is reported at around 60 years.[1][2] The country's maternal mortality rate is 396 deaths/100,000 live births and its infant mortality rate is 66 to 112.8 deaths in every 1,000 live births.

There are over 100 government-run, private or internationally administered hospitals in Afghanistan. The most advanced medical treatments are available in Kabul. The French Medical Institute for Children and Indira Gandhi Children's Hospital in Kabul are the leading children's hospitals in the country. The Jamhuriat Hospital is one of the popular hospitals in the country. In spite of all this, many Afghans travel to Pakistan and India for advanced treatment.

Afghanistan has long been behind when it comes to health management. The decades of war and international neglect destroyed its already-poor health care system. Most medical professionals left the country by 1992, and all medical training programs ceased. In 2003, there were 11 physicians and 18 nurses per 100,000 population, and the per capita health expenditure was $28 US dollars. The nation had one medical facility for every 27,000 people in 2004, and some centers were responsible for as many as 300,000 people. An estimated one-quarter of the population had no access to health care. The international organizations provided a large share of medical care. The drought of 1999–2002 exacerbated these conditions. An estimated 800,000 Afghans are disabled.

Extensive investment in health sector has happened in the past 16 years, which the fragile environment in urban areas underpin the investment. Investment in health sector without deeply consideration of environmental safety, may not be sustainability. Infant, child, and maternal mortality rates in the country reached the highest in the world, by some estimates as high as 275 per 1,000. In rural areas, one in six children die before reaching age five. This is because of poor sanitation and insufficient potable water supply, infectious and parasitic diseases such as malaria and diarrhea are very common. Malnutrition and poor nutrition also are pervasive.

User fees have been a major deterrent to accessing health care. Various interventions have devised to improve uptake of health care services, including the distribution of waiver cards to very poor and female-headed households and the introduction of community-based health insurance which has not taken place yet.

Following the national user fee reduction in 2008, a pilot study conducted by the Future Health Systems consortium found a 400% increase in utilization of services that had previously charged fees for services and medicine. The government's strategy to collaborate with non-governmental organizations has led to higher primary health

outcomes among the poor,[9] with relatively high levels of perceived health care quality reported by clients in a recent study of primary care services.

The physical and psychological effects of war have substantially increased the need for medical care. In the last decade a number of new hospitals were established, with the most advanced treatments being available in Kabul. The French Medical Institute for Children and Indira Gandhi Children Hospital in Kabul are the leading children's hospitals in the country. Some of the other main hospitals in Kabul include the 350-bed Jamhuriat Hospital, the Sardar Mohammad Daud Khan Hospital, and the Jinnah Hospital, which is still under construction. There are also a number of well-equipped military controlled hospitals in different regions of the country. 2011 surveys show that 57 percent of Afghans say they have good or very good access to clinics or hospitals, and Afghans themselves pay approximately 75% of health care costs directly.

As endemic to Afghanistan, tuberculosis cases has been with over 76,000 cases reported per year. It is a serious public health problem in Afghanistan. In 2007, 8,200 people in the country died from tuberculosis and, in the WHO's Global Tuberculosis Control Report 2009, an annual estimated figure of 46,000 new cases of tuberculosis were in Afghanistan. As such, Afghanistan is ranked 22nd in amongst highly affected Tuberculosis countries Wild poliovirus is present in Afghanistan, though in limited areas. Reported cases were on the decline, from 63 in 1999 to 17 in 2007. At the moment, most of Afghanistan is polio-free. The country has not yet interrupted transmission of wild poliovirus.

Malnutrition

More than half of Afghan girls and boys suffer damage to their minds and bodies that cannot be undone because they are poorly nourished in the crucial first two years of life. High levels of Malnutrition in Children is rate of stunting 60.5%, One third of children (33.7%) underweight, Anaemia 50% in children 6–24 months, High iodine deficiency: 72%(school age) and also the high levels of Malnutrition in Women is Iron deficiency: 48.4%, non-pregnant and Iodine deficiency 75%.and high levels of chronic energy deficiency are 20.9% low BMI. Supporting the Implementation of Nutrition (and Health)-Specific Interventions through BPHS and EPHS.

Despite anti-leprosy initiatives by Leprosy Control (LEPCO) dating to 1984, leprosy is present in Afghanistan, with 231 cases reported in the 2001-2007 period. Just over three-quarters of the cases were the MB-type, with the rest PB-type. Leprosy has been reported in the central Hindu Kush mountain area of the country. Mainly in the provinces of Bamyan, Ghazni, Balkh.

Being the 15th least developed country in the world, Afghanistan faces difficulties in sanitation. In urban areas 40% of the population have unimproved access to sanitation facilities. Because of this many Afghanistan natives are forced to combat typhoid fever. Typhoid fever is one of Afghanistan's major infectious diseases in terms of food/waterborne diseases. This infectious disease occurs when fecal material comes into contact with food or water. Symptoms vary from case to case but often mild fever is present and if left untreated death may occur.[3]

Hepatitis A

Sanitation issues place the Afghanistan population at risk of contracting hepatitis A through the consumption of food and water that has been contaminated by fecal material. Hepatitis A works by inhibiting the liver from functioning properly. Symptoms generally include jaundice, fatigue, loss of appetite, while some victims may experience diarrhea. Furthermore, symptoms will appear 2–6 weeks after an individual has come into contact with the hepatitis A virus.

Visceral leishmaniasis infections are often recognized by fever, swelling of the liver and spleen, and anemia. They are known by many local names, of which the most common is probably *Kala azar.* A total of 21 cases of VL acquired in Afghanistan, all in the 1980s.

Maternal and child health care

Afghanistan made significant improvement in the last decade to its maternal and child health care. According to United States Agency for International Development (USAID), Afghanistan's mortality rate has decreased by about 25% since 2003. It was reported in 2006 that nearly 60% of the population lives within two hours walking distance of the nearest health facility. The maternal mortality rate is currently 396 deaths/100,000 live births and its infant mortality rate is 66[2] to 112.8 deaths in every 1,000 live births. The Ministry of Public Health wants to further improve these higher rates by making them normal.

The country has more than 3,000 midwives, with an additional 300 to 400 being trained each year.[12] According to Sima Ayubi, a maternity doctor in Kabul who advocates hospital births, explains: "Now pregnant women have more information about health. This mortality rate is still a problem. There's just a decrease. The problem is not completely eliminated or under control.

Economic Development and Environmental Contemplations

As part of environmental degradation and restoration, the economy of Afghanistan has improved significantly since 2002 due to the infusion of multi-billion dollars in international assistance and investments, as well as remittances from expatriates. It is also due to dramatic improvement in agricultural production and the end of the four-year drought in most of the country. However, Afghanistan still remains poor for now and highly dependent on foreign aids. About half the population suffer from shortages of housing, clean drinking water, electricity and employment. The Afghan government and international donors have remained committed to improving access to these basic necessities by prioritizing infrastructure development, education, housing development, jobs program, medical care, economic reforms and electricity (power energy) over the recent years. The replacement of the opium trade which probably makes up about one-third of the country's GDP-is one of several potential spoilers for the economy over the long term. Table 2 indicates the economic specification in Afghanistan.

The economy of Afghanistan has had significant improvement in the last decade due to the infusion of billions of dollars in international assistance and remittances from Afghan expatriates. The assistance that came from expatriates and outside investors saw this

increase when there was more political reliability after the fall of the Taliban regime.The nation's GDP stands at about $ 19.3 billion 2017, with an exchange rate of $18.4 billion (2014), and the GDP per capita is about $2,000. It imports over $6 billion worth of goods but exports only $658 million, mainly fruits and nuts.[3]

Despite holding over $1 trillion in proven untapped mineral deposits, Afghanistan remains one of the least developed countries on the planet. About 35% of its population is unemployed or lives below the poverty line.[4] Many of the unemployed men join the foreign-funded militant groups or the world of crime, particularly as smugglers. The Afghan government has long been pleading for foreign investment in order to grow and stabilize its economy.

The 1979 Soviet invasion and ensuing civil war destroyed much of the country's limited infrastructure, and disrupted normal patterns of economic activity (See *Democratic Republic of Afghanistan Economy*). Eventually, Afghanistan went from a traditional economy to a centrally planned economy up until 2002 when it was replaced by a free market economy.[7] Gross domestic product has fallen substantially since the 1980s due to disruption of trade and transport as well as loss of labor and capital. Continuing internal strife severely hampered domestic efforts to rebuild the nation or provide ways for the international community to help.

According to the International Monetary Fund, the Afghan economy grew 20% in the fiscal year ending in March 2004, after expanding 30% in the previous 12 months. The growth is attributed to international aid and to the end of droughts. An estimated $100 billion of aid entered the nation from 2002 to 2017. A GDP of $4 billion in fiscal year 2003 was recalculated by the IMF to $6.1 billion, after adding proceeds from opium products. Mean graduate pay was $0.56 per man-hour in 2010.

Table 1: Economy of Afghanistan

Currency	Afghani (AF)
Fiscal year	1st January
Trade Organizations	SAARC, ECO, WTO
Statistic	
GDP	19.3 billion /2017 (latest data)
GDP Growth	14% (2012)
GDP per capita	$ 2,022.1 (2017)
GDP by sector	Agriculture 24%, industry 21%, services: 55% (2014)
Inflation	16.3% (2005)
Population below poverty line	53% (2003)

Labor force	15 Million (2004)
Labor force by occupation	Agriculture 72%, Industry 10%, civil service 10% (2004)
Unemployment	40% (2005)
Min industries	small-scale production of textiles, soap, furniture, shoes, fertilizer, apparel, food-products, non-alcoholic beverages, mineral water, cement; handwoven carpets; natural gas, coal, copper
Trade	
Exports	$ 500 million (2007)
Export	wheat, fruits and nuts, handwoven rugs, wool, cotton, hides and pelts, precious, semi precious stones and opium
Main export partners	India 42.3%, Pakistan 29%, Tajikistan 7.6% (2015)
Import	$6.232 billion (2015)
Import goods	machinery and other Capital goods, food, textiles and petroleum products, most consumer goods
Main import partners	Pakistan 38.6%, India 8.9%, United States 8.3%, Turkmenistan 6.2%, China 6%, Kazakhstan 5.9%, Azerbaijan 4.9% (2015
Public Finance	
Public Debt	External: $ 1.28 billion Multilateral Development (2007)
Revenues	$ 269 Million
Expenses	561 million
Economic aid	Recipient: multi-billion dollars as non-returnable grants to cover 2002 to 2010, most of it from the US and EU

Source: world bank 200

Economic Development and Environmental Degradation

Part 1

Urban Environment

Urbanization, rehabilitation and development process have made it difficult to promote urban environment improvement including different pollutions. Air is life-sustaining, precious natural resource. Its pollution adversely affects public health and the environment including natural and cultural heritage. Concentration of air pollutants is primarily a function of source emissions and meteorological conditions, which are closely related to population density and land-use patterns. In Afghanistan, the natural and man-made pollutants generally prevail in the air, in both urban and rural areas. Their effects can be observed much more readily in major cities and industrial areas. Transport, industry, road conditions, and ever increasing population flow towards large cities are major factors contributing to air pollution in large urban areas. Forest fires and dust generally pollute the air over rural areas. In the domestic sector, particularly in poorly ventilated houses, the use of traditional fuels like wood, cow-dung, and agricultural residues for cooking and heating has polluted the air, adversely affecting the health of the inhabitants.

1.1. Air Pollution

Worldwide, vehicles, generating stations and industry cause most outdoor air pollution. This emits noxious and occasionally toxic fumes downwind of stack. This has neither are a significant present problems in Afghanistan. However, urbanization and congestive urban areas, vehicle fleets, the incomplete combustion of green tree branches, shrubs and agricultural residues cause indoor pollution especially in winter, when doors and windows are closed. Respiratory infections are frequent among women, who are indoor more of the time and children who inhale and exhale more air per unity body weight. For adult men, the problem may be masked by cigarette smoking, which is about 400 times more dangerous.

In addition to emission from the above main groups there are fugitive emissions associated with fuels. These are intentional or unintentional releases of gases from anthropogenic activities. Such emissions may arise with the production, processing, transmission and storage of coal, oil and natural gas. Methane (CH_4), carbon dioxide (CO_2) and Non Methane Volatile Organic Compounds (NMVOC) are some of the emissions reported to be fugitive.

Estimates of various pollutant emissions indicate that that vehicular traffic, windblown and re-entrained dust, brick kilns, residential heating during winter season, and domestic and commercial generators are the major sources of air pollution. The estimated total annual emissions in Kabul for 2006 were 17,363 tons of PM_{10}; 16,183 tons of NO_X; 2,484 tons of SO_2; 97,068 tons of CO; and 650,846 tons of CO_2. The trend per cubic meters were around 1500 microgram/ m3 in Kabul, *(Kabul Air Quality Management/ADB/NEPA/2006*).

Ambient air quality levels of PM_{10}, NO_X and SO_2 in Kabul and other major cities routinely exceed national standards and guidelines. Population exposure has been calculated to assess the costs of morbidity and mortality in general population. Sixty-four percent of population in urban areas have been exposed to very high concentrations of 600$\mu g/m^3$ in

2017, PM_{10} compare to 900 $\mu g/m^3$ in 2007, and 68 percent of population is exposed to more than 120 $\mu g/m^3$ of SO_2. While there is no health impact assessment figures in major urban areas, using dose-response equations developed in the United States, it is estimated that particulate matter pollution causes excess deaths (probably 1950). The estimation by the author indicate that restricted activity days have reduced to almost 13.2 million days in 2017, compare to 15 million restricted activity days in 2006. Therefore, 49 million respiratory symptom days have comparatively reduced to 47.3 million respiratory symptoms in 2017, and yet to be reduced to national standards. This figure is in addition to other health problems. The annual monetary value attached to all these health impacts totaled 6,747 million Afghanis equivalent to $ 99.22 million in 8 major cities. The regular inspection and maintenance of vehicles is also crucial to ensuring that such standards are complied with regulation which is still key challenges.

Despite approved environmental and social impact assessment and development of standards, in some part, the cement industry contributes the highest concentration of pollutants like total suspended particles and probably PM-10[4] . The Pul-e-Khumri, Hirat and Jabaluseraj cities can be more affected by this component. The recent plan for establishing cement production sites in northern Afghanistan, has given strict direction to utilize standard technologies and cement production machineries to reduce the effects of NO_2 and SO_2, which might also be an effective factors air emission in the area. Therefore, the air in the country has also influenced by the six criteria pollutants as well. The values of these pollutants, though, not measured but likely to be main factors. The traffic flow is comparably much higher in various cities than in the past. Illegal import of passenger car has increased incredibly in the past 6 years (2011-2017). Cities with wind blow and wind towards it from other parts of the city is seemingly more affected. Equally there may have been a sizeable contribution from backyard potteries. According to WHO guideline values, the respirable particle PM-10, comprising mostly hydrocarbon, is relatively high in four cities (Kabul, Jalalabad, Kandahar, Hirat and Balkh). This is mainly because of the exponential growth of automobiles, the narrow and poor condition of the roads, substandard fuel quality, and poor traffic management.

Brick manufacturing is a significant source of atmospheric emissions because of the type of processes used in material handling and firing. Substantial amounts of ‘dirty’ fuels are consumed especially unwashed coal. Burning efficiency is low, and there are no filters on the stacks. There are many brick manufacturers in and around the major cities (385 commercial kilns only in Kabul in 2017) mostly located near the outskirts of urban centers and residential areas.

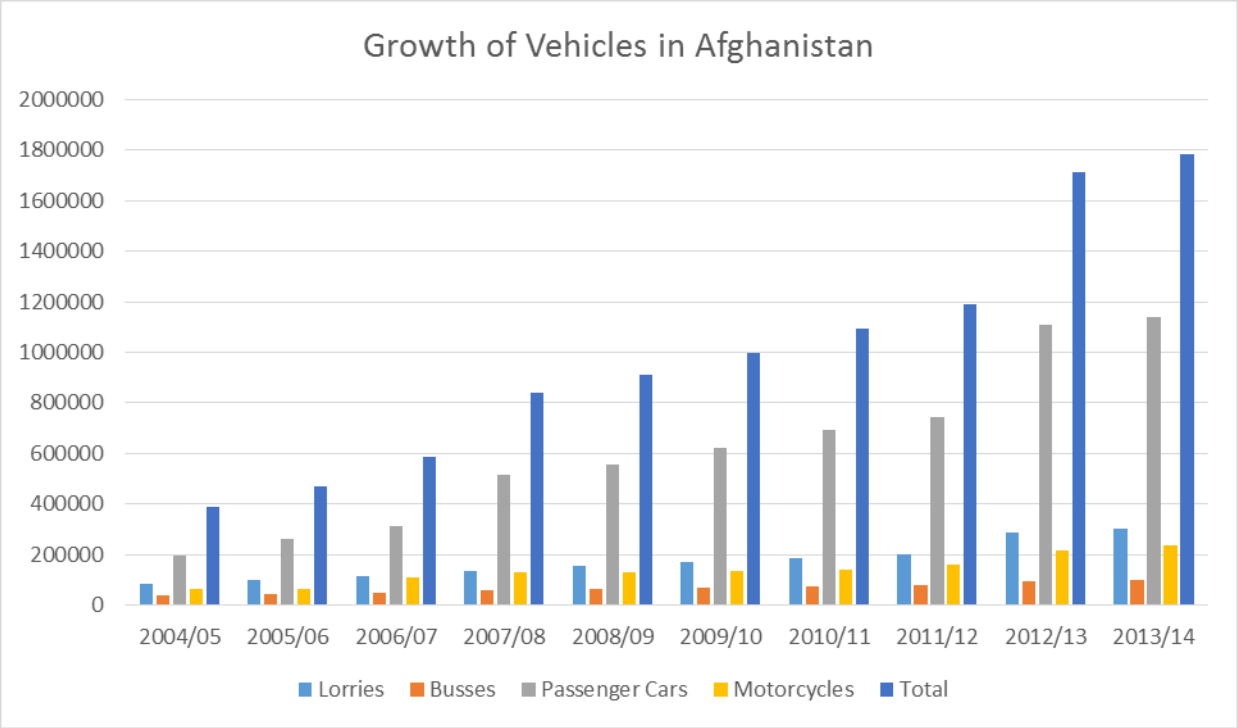
The emission of pollutants is clearly visible, but exact quantification is difficult without stack monitoring. Secondary information estimates that

tons of dust particles, SO_2, NO_2 ,hydrocarbons, carbon monoxide, and fluoride are emitted (author 2017).

Since there is no systematic studies, the problems and the effects of air quality are based on the observation by author and the interviews with the intellectuals and agencies. This is not only due to the large number of vehicles plying the streets, but also due to its geographical features and corridor nature of which restricts wind movement within the cities and retains the pollutants in the substratum, especially during periods of thermal inversion when warm air rests over cold air. This phenomenon often takes place in winter.

1.2. Air Pollution and Its Impact on Human Health and Environment

The severity of the air pollution problems in Kabul continues to pose a significant threat to human health, the environment and the quality of life of millions of people living in Kabul. There has been significant rise in the sources of air pollutants particularly producing suspended particulate matter (SPM), measured as total suspended particulate (TSP) and/or particulate matter less than 10 µm in diameter (PM_{10}), and 2.5 µm in diameter ($PM_{2.5}$). One of the key indicator is the growth of vehicle numbers which is directly relates with growth in fuel combustion, more movement, and traffic congestion which lead to more emissions and more re-suspension of dust from dusty roads. The growth of vehicle numbers in Afghanistan since 2004/05 to 2013/14 is presented in the following figure which shows that in nine years there have been almost five times increase in the import of vehicles in Afghanistan.

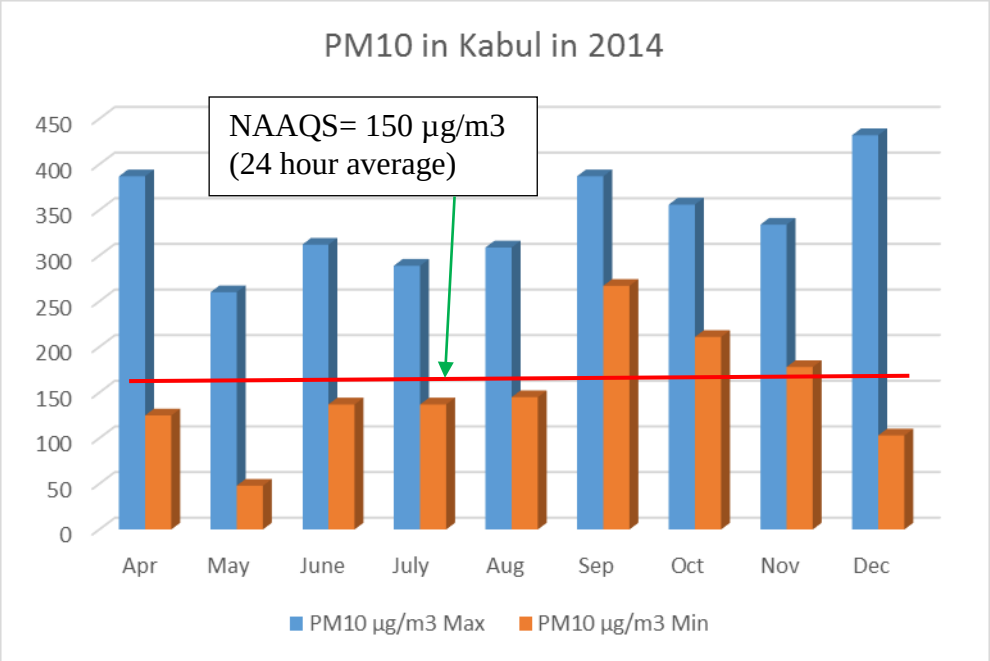


Source: Afghanistan Statistical Yearbook, 2013/14 and previous editions

Another major source for particulate pollutants is construction activities that demands bricks, gravels, sand, and cement. Industries producing bricks and gravels are concentrated in Kabul and are amongst the major contributors to particulate pollutants.

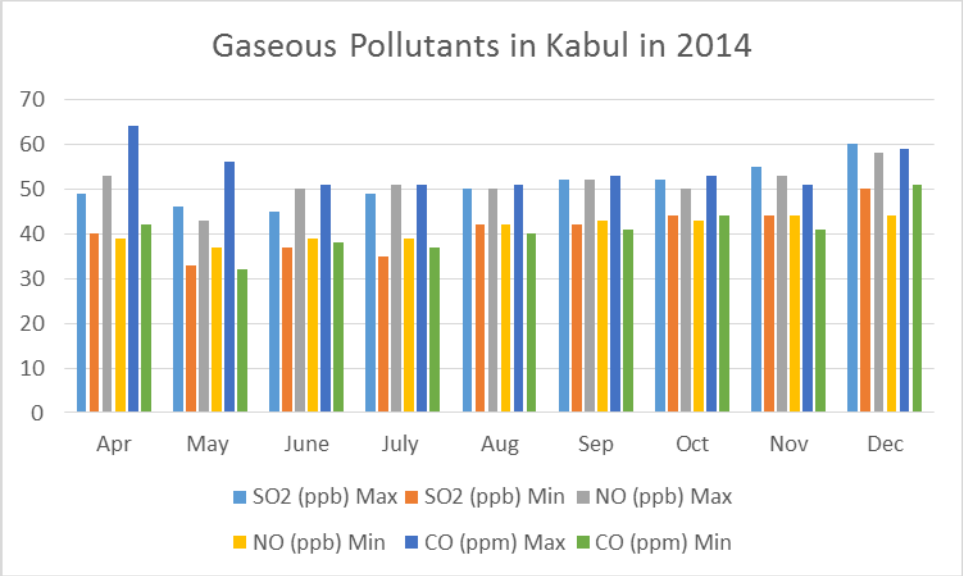
Almost three times increase in the import of cement in Afghanistan (2.5 million tons in 2011/12, 6.06 million tons in 2012/13 and 7.19 million tons in 2013/14, (source CSO 1013/14), clearly shows the boom in construction activities. Other sources of air pollution are small scale industrial activities using fossil fuel, generators to back up the electricity shortages, refuse burning, and use of wood and other fuels for heating purposes.

Efforts to understand the air quality of Kabul were only made in 2005 with support from Asian Development Bank using portable air samplers. In 2011 NEPA has established a permanent continuous air quality monitoring station in its compound[5], The study carried out in 2005 and the recent results obtained from the Air Quality Monitoring Station at NEPA office in Kabul show the levels of PM_{10} significantly high (even the minimum values exceeding the national standard in some months and maximum values more than double in every month) in Kabul and majority of days with the exception of some rainy days, it exceeds the National Ambient Air Quality Standard of Afghanistan introduced in 2011. The monthly minimum and maximum 24 hour average values of PM10, SO2, NO, and CO in Kabul in 2014 are presented in the following figures. Monitoring results of carbon monoxide (CO), nitrogen dioxide (NO2), and sulfur dioxide (SO2) show the increasing trend but still they are found within NAAQS limit values most of the time. Although not monitored in Afghanistan, and looking into the studies carried out in many developing country cities with similar sources in Asia, the concentrations of polycyclic aromatic hydrocarbons (e.g. benzo[a]pyrene), benzene, and heavy metals (e.g. lead, cadmium, chromium, nickel) can be a matter of concern since these compounds are either carcinogenic or highly toxic.



Source: NEPA database

[5] As it is the only roadside technology for Kabul city, it is intended to setup as mobile monitoring station for road side PMs, dust and other AQ parameter.



Source: NEPA database

1.3 Emission of pollutants by sector

Ideally, estimation of emissions is based on information on fuel type, technology, and operating conditions, together with national emission factors. Due to lack of resources, these information has not been created except few. However, in the present report, fuel analysis by the Afghanistan National Standardization Authority used in different sectors to estimate the amount of pollutants in fuel, can be analyzed based on the default emission factors published by USEPA (1992). The pollutant emissions have been estimated for different sectors, viz., residential and commercial, industrial, agricultural, and transport.

Despite extensive substitutions in fuelwood and other biomass utilization into gas and electricity in major cities, fuelwood and biomass is still the major sources of heating and cooking that emit pollutants in domestic and commercial areas of major cities. Fuelwood is the most common source of fuel in both sectors, but there are considerable differences in percentage consumption.

The use of coal and charcoal is heavily dominant in the domestic sector especially in cold seasons, but it has the second highest percentage in the commercial sector. Recently, minor changes are seen in the energy use pattern that has shifted to some extent from traditional fuels to liquefied commercial petroleum gas (CNG & LPG). Due to high price, many citizen can not afford to be supplied, and the traditional use of fuelwood, and other liquid and solid fuel is getting higher percentage. The other key factors of solid fuel substitution into clean fuel, is the dominant chain of different fuel suppliers. They often reduce the price of liquefied gas during summer to Autumn, but reduce the supply at the time when households and business demands are increased. As a results, the households and others rush to solid fuel to maintain their needs for harsh winters. It is estimated than in winter, beside thermal inversion, all households use traditional fuels, which will reduce the quality of air especially in urban areas.

Transportation sector relies mostly on fossil fuel products; the largest usage is for diesel, which accounted for 56% of the total fuel consumption including 723000 vehicles only in

Kabul and other 4 cities to date (2017). The other fuel type is gasoline, which accounted for 43% respectively. The consumption of energy by the agricultural sector is the lowest among the four sectors. Emission is totally dependent on the consumption of high-speed diesel oil. There is no mass transit facilities, which has increased the individual vehicles uses in big cities. Mass transport sector once active in 1980s has been collapsed and all buses were destroyed or sold out by militias in 1990s.

Impacts

The harmful effects of atmospheric pollution are widespread and varied. There is no doubt that concentrated atmospheric pollution in particular locations has caused adverse effects on human health and biotic life. One of the very tangible effect is the hospitals, daily records of government and private clinics and etc. Out of 120 patients (55 government hospitals and clinics, 28 private clinics and 37 recovered patients) interviewed in Nov. 2016, 45 of them have been infected due to air quality of different pollutants, and the rest were indirectly suffered prolonged unrecoverable diseases. They indicated the yearlong spots in hand and face as well as irritation, cough and respiratory infections. With due consideration of total 125 hospitals, 755 basic health clinics and 412 secondary clinics at the country level including those centers that belongs to different ministries and agencies, the cumulative air quality in the country doubled the mortality and morbidities especially children and elder. Therefore, due to low awareness of the causes of diseases, most citizen claims of low air quality, while there are various other factors including but not limited to low quality food, water quality and waterborne disease, the dust release from construction and windstorms.

1.1 Health Impacts

Adverse effects of air pollutants on human health can be acute or chronic. Acute effects manifest themselves immediately upon short-term exposure to high concentration of air pollutants, whereas chronic effects become evident only after continuous exposure to low levels of pollutants.

Medical records from hospitals in the Kabul city revealed that urban residents have more respiratory diseases than rural residents (Malikyar 2017). This may be due to deterioration of air quality in urban centers. Acute respiratory Infection (ARI) is one of the top five diseases. Respiratory diseases occur mainly as a result of prolonged exposure to smoke and dust ARI continues to be the leading cause of death among young children, accounting a serious death in children under five years of age

A strong correlation between the prevalence of chronic bronchitis and indoor smoke pollution in Kabul and other 4 cities is revealed. It is also observed that a high percentage of the bronchitis cases are due to indoor smoke pollution in most town districts in Kabul, Herat, Mazar-e-Sharif, Pul-i-Khumri, Kunduz and Ghazni. Jalalabad and Kandahar cities are affected by particulate matters from vehicle and roadside dust. Diesel generators in all major cities to generate electricity is extremely high. The indications of twice in incidence of many traditional cooking stove owners than improved cooking stove owners complained of eye irritation and coughing. The indoor air in most rural areas is polluted because of combustion of biomass in poorly ventilated rooms. The majority of children are

victims of their parents carelessness of being accused of smoking indoors, use of low quality fuel in rooms, keeping children close to heats born from rubbers and plastic. This is because of low understanding of parents.

The impact of a reduced oxygen level on roads is already apparent from the health prospective. There have not been any blood picture of the people residing in or making a living at various traffic intersections. But due to the physical disability, health effects, tension, and serious blood pressure among them, and their presence in central traffic intersections (especially in central and commercial parts of cities), for making livelihood has created serious health infections among children, young and olders. Most of the street sellers in the congestive traffic intersections are young boys between 8 to 25 years old. According to Wazir Akbarkhan Hospital in Kabul (Oct. 2016) and a podiatrists in Ibnisina chest hospital, these people may not complain of any illness, but their future physics may not be as good as others in the society. Considering the interviews with those making livelihood in traffic intersections, they complain serious respiratory infections, eye ach, eye and nose irritation etc. The interview with 20 hawkers in the city indicates that out of 20, five of them has been permanently complains of cough and cold, 6 persons indicated eye and nose irritation and the rest are feeling sad but not complain serious infections. In line with incomplete combustion and vapors of fuel in petrol stations, it was found the health of petrol stations workers are extremely in risk.

A study of impacts of fuel in petrol pump station's on the health of workers, it was found that the perceptions of residents around the sources and the workers are similar. The interview with 11 workers of fuel pump stations revealed that all suffer from the adverse impacts of fuel vapors, wave cycles and exposure to it. Out of 25 people leaving in vicinity of petrol stations, four are affected. Therefore, out of 11 workers of petrol stations, two complains of frequently cough, low appetite, primary symptoms of respiratory infections, permanent tiredness, low productive hours, and even neurological disorders. One of the workers claimed sexual disorders after two years working in fuel pumps.

1.2 Impacts on Vegetation covers

Kabul and other 3 major cities have been denuded of vegetation covers during the past years especially 1991-2002. It was because of conflicts in Afghanistan, and many cities have not been safe of destruction and the illegal activities of cutting trees and vegetation covers. There are good evidence of urban reforestations and increased in urban vegetation covers from 2002 onward. Increased development activities, rehabilitation of residential, commercial and other infrastructures, including urban road networks, the air quality has also decreased and pollution affected the new generated plants and trees.

Shortages of power in most parts and lack of energy alternatives degraded the existing vegetation covers including the urban forestry. The worse air quality during winter time is in congestive cities. The urban activities have had almost extremely negative impact on vegetation in the surrounding area. Dust deposition on leaves blocks the stomata. The soil became hard because of calcium deposition, affecting the germination of seeds.

Land use pattern has also changed in the past 16 years, and most of cultivated land appropriate for mass forest have been converted into illegal buildings and townships. If the

trends continue, it is predicted that no cultivated land will be available to plant a single tree in lowland areas.

1.3 Impacts on Visibility

Lack of atmospheric data in Kabul and other cities, makes it difficult to maintain the exact level of visibilities. The visual observations during four seasons in Kabul and 8 other cities of Mazar-e-Sharif, Hirat, Kandahar, Kunduz, Pulikhumri, Jalalabad, Ghazni Maimana indicate a decrease in visibility compare to 1970's. Therefore, the atmospheric date obtained from the Kabul airport in 2015, show that there has been substantial decrease in visibility in the city since 1980's (author Oct 2017). The number of days with good visibility around noon decreased in the winter months from more than 20 days/month in 1970's to almost 10 to 18 in summers and 10-12 days in winters. Low visibility and poor sunlight during winters are also associated with dust from streets, roads and some industries. Presently, there are various new regulations that can be sufficient, but lack of compliance has left the law aside from implementations.

2. Progress

Since 2005 when Afghanistan initiated the first module of urban air quality, and to address the air pollution problem, the following progress have been made:

1. Establishment of National Environmental Protection Agency (NEPA), in the structure of government
2. Environmental Law (2007), and associated regulations including air quality control regulation (Gazette 2009)
3. Development of a coherent air quality management policies and approaches,
4. An strategic action plan comprised of abatement measures for the short, medium and long term. Two types of recommendations were made (institutional and technical).
5. A division with a clear mandate and sufficient resources made responsible for air quality management in the country. In addition, capabilities for data gathering and processing has been relatively improved.
6. The crucial issues of identification of gross polluters, a mechanism of penalty and incentivity and brining in to compliance on a reasonable timescale, or forced to close, have been routine agenda of environmental Inspection.
7. Integration of air quality into national agenda through different coordination for a.
8. Vehicle emission standards have been established and strictly enforced.
9. Policies for import and use of clean fuels to reduce emissions from transport sector, residential heating, bakeries, public wash-halls (Hammams) and other sources have been developed and implemented with relevant stakeholders.
10. Relocation of almost all major pollution sources form residential, commercial and other congestive areas have occurred.
11. Vertical Shaft Brick Kiln technology has been adapted, but due to lack of compliance, enforcement has not taken place properly. to Kabul's operating environment to reduce pollution from brick kilns.
12. A systematic public awareness programs through different channels including media, ministry of Haj, Ershad and Auwqaf, and mosques, has been a major activities.

13. Setup a high level commission for Air Quality management with regular meetings and decisions for implementation is going well.
14. Incorporation of air quality issues into education system, universities, institutions, public and private organizations, which is a fundamental component of the plan for bringing about policy changes intended to reduce air emissions and impacts on human health and welfare.
15. Cabinet approval on banning import of old cars (more than 10 years)
16. Ban on leaded fuel
17. Support gasification of old vehicles and introduction of national standards for vehicular gasification
18. Development of air quality standards (4 incl. Eruo III)
19. Policy of clean fuels and change of solid fuel and Diesel to gas and electricity in government institutions in urban areas
20. Enforce maintenance of vehicles, especially government and government contractors buses. Efforts were made to reduce the number of daily trips of government contractor buses by staffs' self-transport arrangement.

3. Indirect activities that covers the Progress

The government has formulated the following acts followed by policies and bylaws to combat air pollution in the country:

- Environmental Act (2007)
- ESIA regulation
- Policies (Kabul Air Quality Strategy, followed by National Strategy of Air Quality Management.
- EIA guidelines for the industrial sector and the environment and risk assessment guidelines have been prepared.
- Setting up a oversight committee at the cabinet level
- Air Quality Management Regulation
- Water Quality Control Regulations
- Setting up High Commission for Air Quality Management
- Five years Air Quality Strategic Plan, followed by AQ Emergency Response Plan
- Air Quality Management Standards
- Ban on imports of used and old vehicles and gradual phase out plan for old vehicles
- Procurement of AQ monitoring equipment for Kabul
- Plan for procurement of AQ monitoring equipment for other major cities
- Public awareness programs through different channels
- Establishment of networking with civil societies and private sectors
- AQ coordination network

4. Gaps

A number of issues that make it difficult to improve air quality in Kabul, include but not limited to:

1. No vehicular inspection system in Kabul and other major cities. The National Environmental Protection Agency and Ministry of interior are responsible by law to implement, with unfortunate follow up
2. Lack of air quality monitoring and analysis in major urban areas to determine the sources of pollution (monitoring capacity is existed but in low level). This issue has resolved partly in Kabul, but yet to equip the section with additional sophisticated air, water, noise and soil quality monitoring equipment.
3. Lack of overall Health Impact Assessment in urban areas, to maintain the estimated and exact number of mortality and morbidity in urban areas
4. Slow support of “Reduced solid Energy Strategy”.
5. Adulteration of fuels are a serious issues. Despite the air quality management regulations, installation of fuel quality monitoring laboratories in major bordering areas, lack of compliance are still major burdens
6. Poor maintenance of vehicle and generator engines
7. Lack of rules on prohibition of over weight of consignment and passenger transportation in urban areas
8. Lack of industrial and emissions inventory
9. No emissions testing data for location and process-specific operation
10. Emission standards for various source types are non-existent
11. Good practices and guideline for AQM are not known in Afghanistan
12. Given post-war conditions, pressures and other priorities in rebuilding Afghanistan, relatively little attention is currently given to address air quality issues at the local or regional level in Afghanistan
13. A wide range of data gap exists on different aspects of air pollution, as well as between Kabul and other parts of the country. In many parts, no monitoring of air pollution caused by different factors has been carried out. Agencies that are responsible for environment, health, urban development and awareness have lower capacity to introduce measures to control air pollution according to its own requirements under the central and local governance act. This act is in a very traditional state that would not be sufficient. This should be updated accordingly or designed.
14. Afghanistan has 6 major cities that suffers over population specifically from 2001. Weak city municipals and lack of proper management, planning and traffic management has left serious pressure and it is ever growing.
15. Systematic assessment of air quality has not been carried out in Afghanistan, because of lack strategic air quality monitoring policy, infrastructure, and technology. Furthermore, the concept of an Air Quality Management System (AQMS) was absent from the national policy that has been considered recently.
16. Similarly, there is no Air Quality Information System (AQIS), and this has limited the scope for comprehensive presentation of the state of the atmospheric environment.
17. Low priority is given to research works on air quality.
18. Lack of quality assurance
19. Lack of information on ambient air quality around brick kilns and other polluting industries
20. Lack of data on the impact of the brick, traffic and other industries on human health, and biotic and abiotic components
21. Most of the project activities rely on the foreign or international experts with little focus on the technical capacity building of national staffs have been a challenges.

This has left a very negative impact on the project continuation and follow up after the project submission. At the meantime, it is likely that non of donor agencies have concentrated on the sustainability of projects.

5. Recommendations

5.1 General

1. Follow up the development fund through the national budget to establish air quality monitoring stations in almost 6 points in metropolitan Kabul with the technical and financial assistance of relevant national professionals.
2. Air quality monitoring activities should be carried out at different levels in different parts of other major cities by NEPA. The successful modules can be duplicated to all other major cities.
3. Process to adopt an appropriate technology for alternative energy to help reduce the great dependency on traditional energy sources; this should be a follow up of 10 years Strategy on alternative energy by the Department of Renewable Energy
4. During the past years, a number National & International NGOs installed a few biogas plants in different provinces. This can be extended to those geographical areas that can be feasible.
5. Extend Installation of solar energy photovoltaic systems by different schemes and agencies including MRRD and MEW in almost 65% of rural areas and households in remote places, where it is not feasible to link with the central grid systems and where micro-hydro electricity is not feasible. Pilot PV pumping system in schools and clinics in different parts in the country (ADB/MRRD) is evident of potential. This should be extended
6. Extent fuels substitution strategy into all populated cities to reduce the traditional solid fuel to CNG and LPG).
7. Pilot biogas plants in different part of the country. This has examined in different manners. The effectiveness was in arid areas
8. Extension of electricity generation by solar and wind or a hybrid system in major cities that reduce the current pressure on imported power and available electricity generations in the country.
9. Mass awareness programs
10. Provision and extension of mass transportation
11. Carry out studies on the impacts of air pollution on the general health of people, and on abiotic and biotic component
12. installation of vehicular inspection units in Kabul and other major cities
13. Develop Traffic Management Program
14. Develop studies on depleted Uranium and other hazardous waste

5.2. Specific

1. Work on additional and secondary air quality standards and guideline
2. Policy framework for promotion of alternative fuels to bring down fuelwood consumption
3. Promotion of mass transport systems (private sector)
4. Proper and environmentally sound road planning for cities

5. Promotion of cleaner fuels and ban on import of low quality fuel including De-sulfurization of diesel
6. Promotion of unleaded fuels (catalytic converters)
7. Policy to phase out old vehicles
8. Improve industrial boiler efficiency and introduce cleaner technology for brick kilns
9. Proper implementation of Euro and WHO standards
10. Cleaner production should be made mandatory for small-scale industries, and proper standards for large-scale industries.
11. Industrial zoning and the movement of industries away from residential areas and environmentally sensitive sites should be considered.
12. IEE/ESIA should be seriously implemented in new industrial establishments.

5.3. Legislation

1. National Constitution of the Islamic Republic of Afghanistan 2004, article 15 (protection of Environment).

    - The government should give priority to protecting the environment and take special measures for preventing further damage due to physical development activities

2. Industrial Enterprises regulations (to be updated within the adopted procedures)

    - Specific measures for prevention of environmental pollution and its effect on public health

    - Regulation on a healthy, safe, and secure environment for workers
    - Ensure solid waste management and control of noise and air pollution through enforcement of already noise and air pollution prevention regulations

3. Vehicle and Transport Management strategy and implementation

    - Empowers the government to set emission standards for vehicles and enforce them in practice.

4. implementation of the Environmental Act (2007)

    - a comprehensive government funded program for public and private sector awareness
    - NEPA to be empowered to prohibit the use of any matter, fuel, equipment, or plants that has or is likely to have adverse effects on the environment.

5.4. Policies

The following policies are an immediate requirement for AQ control

- Seek ways to fund programs for implementation of policies with respect to all types of pollutions e.g air, soil noise, and water pollution etc.

- Industrial effluent discharge, noise abatement standards, and correlative mitigation and preventive measures
- Enforce the establishment of air and water quality monitoring and evaluation systems
- Implement the air, water, noise, and land-related pollution control management plans
- Continue and revise vehicular emission standards
- Establish and implement emission standards for air pollution and an appropriate management plan to check emissions from industrial premises (FUTUR ACTION)
- Commitment for specifying air pollution standards

5.5. Policy response: activities to be implemented to mitigate air pollution

- Accelerate the process of actions on vehicle exhaust emission test, following the tail-pipe standards of 65 Hartridge Smoke Units (HSU) for diesel-operated vehicles and three per cent of carbon monoxide (CO) for petrol-operated vehicles

6. Afghanistan and international Environmental Multilateral conventions

To mitigate the present air pollution problem of immediate concerns that includes a number of hazardous gases, particulate matter and other pollutants in major urban areas, participation of Afghanistan in international treaties is essential. To address Indoor air quality which aggravated by the extensive use of biomass as a source of energy, public awareness of the hazards are of primary concerns.

Afghanistan has become a member of Clean Air Initiatives of Asian Cities, Environmentally Sustainable Transport, Better Air Quality for Asia and a number of Multilateral Environmental Agreements and International Protocols for Chemicals. Ratification of Kyoto Protocol has been completed and Afghanistan has initiated a network to register project for Clean Development Mechanisms to reduce carbon emissions.

Ongoing development activities and changes in lifestyles, particularly in the large cities, perhaps cause an increase in concentrations of air pollutants such as TSP, CO, Pb, SO_2, NO_2 in the ambient air. These causes have been discovered within NEPA Management. Therefore, Afghanistan needs to introduce measures, first focusing on preventing the problems of air pollution at source, and then on control measures to abate other problems.

Multilateral Environmental Agreements to which Afghanistan is a Party

#	MEA Name	Date of Signature	Date of Accession
1	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	30 Oct 1985	28 Jan 1986
2	United Nations Framework Convention on Climate Change Convention (UNFCCC)	12 Jun 1992	19 Sep 2002
3	United Nations Convention on Biodiversity (UNCBD)	12 Jun 1992	19 Sep 2002
4	United Nation Convention to Combat Desertification (UNCCD)	12 Nov 1994	01 Nov 1995

5	Vienna Convention for the Protection of the Ozone Layer	12 Mar 1985	17 Jun 2004
6	Stockholm Convention on Persistent Organic Pollutants	22 May 2001	20 Feb 2013
7	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	10 Sep 1998	06 Jan 2013
8	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	22 Sep 1998	25 Mar 2013
10	Convention on the Conservation of Migratory Species	1983	01 Aug 2015
11	The Montreal Protocol on Substances that Deplete the Ozone Layer	26 Sep1985	17 Jun 2004
12	Kyoto Protocol to the UNFCCC	11 Dec 1997	25 Mar 2013
13	Cartagena Protocol on Biosafety to the UNCBD	15 May 2000	20 Jan 2013
14	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the UNCBD	05 Jun 1992	17 Jan 2017
15	Minamata Convention on Mercury	10 Oct 2013	02 May 2017
16	Ramsar Convention	1971	*In process*

7. Chemicals and the Impacts on Environment

Both chemicals and waste play critical roles in today's society and economic development processes. At the same time they have major impacts on the environment and human health. De facto, many chemical substances are harmful to people and their environment while many forms of waste result hazardous and pose dangers to our lives and the nature surrounding us. Despite efforts to reduce ozone depletion Substances throughout the country, there has been a number of action plan to reduce illegal chemicals including PoPs, insecticides, herbicides, etc.

To address this urgent issue and provide mainstream solutions, working closely with governments, industries, and civil society organizations to adapt mechanisms of reduced impacts of chemicals on air quality. In doing so, NEPA and its partners focus on achieving the World Summit on Sustainable Development (WSSD) goal that by 2020 chemicals are used and produced in ways that lead to the minimization of significant adverse effects on human health and the environment. In this way, businesses and other stakeholders are supported to improve their capacity to manage chemicals and waste soundly throughout their life-cycles. This will be achieved by jointly developing policy instruments, including regulatory frameworks, and providing scientific and technical knowledge and tools needed to ensure a successful transition among countries towards sound management of chemicals and waste in order to minimize impact on the environment and human well-being.

8. Other hazardous Chemicals pollution

The National Environmental Protection Agency has prepared the National Implementation Plan (NIP) in partial fulfilment of its obligations under the Stockholm Convention on Persistent Organic Pollutants (POPs).

The Stockholm Convention came into effect in 2001 and Afghanistan acceded in 2013. The Convention exists to eliminate or reduce the release into the environment of POPs, a class of highly toxic and stable chemicals produced by human activity and which accumulate in the environment and are transported and concentrated in certain regions by atmospheric circulation. Though, it is not possible to measure the direct impact of POPs on the health of the Afghan people or on the natural environment; however, both remain highly vulnerable. In the cities, there is a high level of atmospheric pollution from the use of organic fuels which are known to produce dioxin-like substances. End-of-life products liable to contain POPs, are disposed of in solid waste from which they may leach into water courses and groundwater on which most people depend for their domestic supply. Industrial waste water mixes with domestic sewage and both are discharged in water ways without effective treatment. Only one of Afghanistan's drainage basins discharges into the open sea. The rest drain into inland basins and wetlands, where the accumulation of toxic chemicals will be most damaging.

A largely qualitative inventory of POPs releases in Afghanistan has been made, which identifies clear national priorities for addressing POPs. The most significant is the unintended production of dioxin-like substances from the use of wood and coal for domestic heating and cooking. Also of major importance is the disposal of end-of-life materials manufactured while POPs such as the brominated fire-retardants HBB, PBDE and HBCD were in widespread use. It is impossible to estimate the quantities that may exist in the country as no statistics of imports exist for the relevant period, but any there are will be released into the environment unless the materials that contain them are disposed of in an environmentally sound manner. The same considerations apply in relation to PFOS in textiles, plastics, synthetic carpet and paper products among many others. This is complicated by its continued acceptable use under the Stockholm Convention for aviation hydraulic fluid, fire-fighting foams and certain medical devices.

The final significant source of POPs that was identified was the remains of the pre-war electrical distribution system in which cooling oils containing PCBs were used in transformers. Over 3000 transformers from this period remain in Afghanistan, some still in use. Less significant, but worthy of note, are contaminated sites where HCH were stored for locust control until the 1990s and incineration of medical waste.

Based on these priorities, chemical action plans have been prepared, involving a number of responsible ministries and agencies. Most importantly, these include ongoing strategies to reduce air pollution and to improve management of solid waste. The electrical supply company, DABS, will undertake a survey of the remaining old transformers to determine their condition and make plans for their replacement and disposal. The Ministry of Public Health has an ongoing project to equip government hospitals with modern incinerators. These POPs action plans also include setting standards for products and materials that exclude POPs, and the Customs Service will develop Tariff Codes to identify commodities liable to contain POPs.

To make this happen, Afghanistan joint four chemical protocols in the past couple of years. With this, NEPA is implementing a threefold, results-based management strategy targeting the following expected accomplishments as part of its legislative Framework:

1. **Institutional Capacity and Policy Instruments**: to increase the institutional capacity and policy instruments of the country to manage chemicals and waste soundly, including the implementation of related provisions in the multilateral environmental agreements (MEAs);
2. **Scientific and Technical Knowledge and Tools for Sound Chemicals Management**: to increase the use of scientific and technical knowledge and tools by country. Major groups, universities, stakeholders and academia, has been requested to implement sound chemicals management and the related multilateral environmental agreements;
3. **Scientific and Technical Knowledge and Tools for Sound Waste Management**: to increase the use of scientific and technical knowledge and tools by the country, coordination with major groups and stakeholders, has been setup to implement sound waste management and the related multilateral environmental agreements;

9. Environmental Management

9.1. General Administrative System

Despite large gaps in capacity, legal framework, human resources, financial resources, lack of interest in environmental protection and management skills in top administrative positions, there has been good progress in developing policy instruments, legal framework, strategic planning, coordination, public awareness, environmental education, integration of environment into national agenda as cross cutting issues.

9.2. Environmental Employment

Employment is basic part of environmental sustainability.

- Apart from almost 850 staffs that has been directly recruited under NEPA employment framework and human resource strategy, NEPA encouraged around 92 associations, 285 young environment professionals, and almost 21 private sector initiatives to support environmental protection and projections in the country.
- Grant of almost 33 small scale size under Small Grant Program, NEPA/GEF/UNDP, in the country which has provided employment opportunities for almost 400 direct and indirect beneficiaries.
- Facilitate funding of around 18 medium size projects on biodiversity, climate change, environmental quality inspection, sustainable development and capacity building. Around 500 direct and indirect beneficiaries have been engaged.

Part 2

Natural Heritage Protection

Vegetation cover in the country depends on the geographical and ecological factors such as soil component, elevation, moisture, temperature, and wind-fleet etc. It makes an extensive spectrum of perennial plants and non-perennial plants. There is valuable confirmation to suggest that the natural vegetation of large parts of Afghanistan was originally woodland forest centuries back. Before the war while not much, but some parts of the area were covered by forest of which the irresponsible cutting of the forest resulted a great lost. Centuries of destruction have resulted in the almost complete disappearance of forests from plains and valleys of the country.

Scattered remnants of juniper stand on the northern slopes of the HinduKush give evidence of the previously large forest on the non-barren slopes. The formerly extensive tamarix forests of southwestern Afghanistan have been heavily over exploited and now exist as scattered bush stands. As far as diversity is concerned, on the basis of dominant species and ecological distribution, it can distinguish 10 types of forests in Afghanistan. This classification is based on literature revised are:

- low population density due to unfavorable topography in higher elevations
- protection of economically valuable trees such as *Pistacia vera* and *Pinus gerardiana*

- protection of trees around grave yards, tombs and shrines such as almond forests, mulberry, palms, poplar and others because of religious beliefs

- Most of natural forests of Afghanistan are physiographically climax because of inadequate rainfall. Soil conditions become more mesophytic at higher elevations and allow the development of the unique altitudinal zonation in forest types. Over 80% of national energy budget production and mud bricks industry contributed to the disappearance of juniper and Oak Forest.

1. Wetland and Lake Ecosystems

Wetlands are places where water is the influential body, collects water and saturates the soil for at least part of the year. There are tree types of wetlands in Afghanistan, river courses, lakes and marshes and artificial lakes. Since most of Afghanistan is very dry, the few existed wetlands are of significant importance. Most river courses are liable to great seasonal variation in water level and are subject to intensive human use. Many of the non managed rivers are not particularly rich in wildlife habitat except Amu Darya, which meanders through an extensive area of natural marsh and scrub (Salix spp). Under climax vegetation condition the river valley ecosystem support forest and a variety of wildlife, however the lack of trees along most contemporary river courses is a

consequence of the erosion that follows removal of the vegetation by cutting and overgrazing. Natural condition would have been supported a rich fauna including some great number of mammals now rare or extinct in Afghanistan. Many rivers in Afghanistan do not have outlet to the sea and drains into a series of depressions where there dry later due evaporation. The rest are in the formation of large shallow saline lakes and marshes. Seistan is counted the most extensive water flow river in the southwest. Ab-e-Estada and Dasht-e-Nawor in Ghazni, Hamoon pozak and Saberi in Neemroz and Farah provinces, Kole Hashmat khan in Kabul, Zarkul, Darqad and Chaqmaqteen in Pamir of Badakhshan are the most outstanding wetlands and habitat for waterfowls. These biologically productive ecosystem are mineral rich and considered to be of international importance for migrating and wintering waterfowls.

Artificial bodies such as Kargha dam, Saroobi dam, Darunta Dam, Naghlo, Sarde dam, Ghazi dam while not biologically rich, but can attract migratory birds and recharge the ground water. However, they do support fish population as well as habitat for fish eating species of birds. There are various small wetlands and lacks though out the country, potential for protection as district and provincial conservation area including river basins, marshes, swamps, sloughts, kettlehole, bogs and fens which many of migratory birds and find many of their needs in it. In 2005, studies were conducted on a wetland in Ghazni (Dashte Nawor) to be nominated as Ramsar sites. This may need further focuses and studies to fulfill the Ramsar nomination criteria. Afghanistan is among a few nations where historically reserved hunting grounds existed since centuries. The Ajar Valley and Kole Hashmat Khan are best examples that were hunting reserves in Mongol and Mughal times. The country had realized need for protecting its natural resources in early 70's and had started establishing its protected areas network according to modern scientific approaches. By mid 1970's it had established one national park and four waterfowl reserves and had proposed ten areas for designation under different categories of protected areas. Unfortunately, the rhythm could not be maintained due to the political unrest, and subsequent military invasion. The three decades long war wrecked not only structures and people but hewed every process and wealth, not sparing that of the protected areas.

Based on the field observations, discussions and review of secondary data, the government recommends restoring legal status of the designated protected areas, providing effective institutional protection, conducting detailed inventories for developing land use and management plans, and establishing linkages between socio-economic development and natural resources conservation there. The mission identified two wetland sites of "Aye Khanum wildlife and Archaeological site" and "Weghnon Lake" in Takhar province. Preliminary observations suggest these have potential for designation as protected areas. The mission recommends conducting detailed inventories there and holding dialogues with the local communities of these sites on proper demarcation and design of these sties to establish protected areas of suitable categories. To establish an effective and workable protected areas network in the country, an enabling environment is required that could be achieved through a capacity building, education and awareness raising program for the protected areas, in addition to gaining political well and developing appropriate policy guidelines.

1.1. Band-e-Amir National Park (Gazetted 2013)

Pressures: The site was lost status of a national park that enjoyed since 1974. During the past decades, it presented “tragedy of the commons” and all abuses of the sanctity of such a beautiful landscape features toke place. Water pollution, unorganized development, waste disposal, unmanaged infrastructure, use of fuel operated boats, illegal fishing and swimming, is a few to name. Inspite of all, five of the six lakes of Band-e-Amir were still hallmark of scenic beauty, and seemed to have the criteria of protected areas categorization to re-asses and prepare its management plan.

The Qambar Lake, second in the series from west to east, has been drained due to landslide in the past, and ***converted to a grass land with a small streamside marsh***, has lost its characteristic of a lake and may lose the small marsh surviving the drainage. However, it may gradually rebound with natural or project restoration efforts.

The local community, poor and remotely located is highly dependent on ***dryland farming practices (lalmi)***. This traditional practice extends in some areas to the land right above the lakes. This could be observed specifically in Abqul and Kupruk areas. In order to reduce part of the pressure on overgrazing and burning of plant residues and animal dung for heating and cooking, a program of rural electrification considered the villages in and around Band-e-Amir to be provided with solar photovoltaic system.

The interim management plan for Band-e-Amir National park provided basics to fulfil the international standards and categories for nomination of BA as Afghanistan’s first National Park. The NP has considered the communities and encouraged to take stewardship contribution in the area.

The current management plan has also considered generate employment opportunities to reduce more pressure on the surrounding lands to feed increasing population, where there was cultivation in many areas falling within less than 500 meters of the lake surface.

Livestock is the second major source of subsistence livelihood in the area. ***Grazing of a large number of livestock***, almost in every corner of Band-e-Amir, not only degraded vegetation cover but also resulted in spreading dung and droppings everywhere, especially on the water bodies. Protected areas committee of BA has taken possible steps to reduce this challenges by using alternate grazing areas and consideration grazing alternative and seasons.

The National Park Management office reports that a good number of people visit the area, specifically Haibat Lake on holidays such as Fridays. The visitors are from different

geographical areas of Afghanistan. This has created good opportunity for Bamyan province in general and Band-e-Amir communities specifically to generate jobs and make livelihood. The local people, from Bamyan and surrounding areas offer prayers and enjoy daylong picnic on the lakeside. The reports also reveals an increase in foreign tourists, who are mostly expats visiting Afghanistan and or working with different donor agencies and NGOs.

The ranger station, which works as BA office and community center is working closely with the communities and visitors to raise awareness to keep the integrity of the national park naturally. Although, there has been efforts in place, there is evidence of ***garbage disposed off*** to the surrounding areas of the lake, and ***waste dumped*** in some parts around the Haibat Lake. The newly established facilities and access road to Band-e-Amir National Park motivated many visitors to visit the area. In contrast to years before, the visitors do not allowed run their ***vehicles*** in any direction, which causes to create small multiple streams down the dam of Haibat. Parking lots has been allocated as per the management plan. The new building of National Park office in a distance of 1.2 km from protected zone, is significant for shuttle transportation. This will reduce the flow of small passenger cars to the facility zone. The office will also, organize tourism base guide and directions to be controlled through guided tours.

Motorboats, owned by some influential of the area, has been operated in Haibat Lake of BA, which was the ***key threats*** to the lake's ecological integrity. The oil from the boat engine was contaminate the waters, and its noise disturbed birds in the area. The management plan has reduced motorboats to paddleboats, and non of motorboats are allowed to operate in the dam. Small ***shopping area and small hotels*** were setup by the shrine, where mostly fish caught from the Haibat and Zulfiqar Lakes have been offered for sale to visitors. Illicit and ***uncontrolled fishing has been*** threaten population of the native fish species. Presently, fishing is not allowed in protected zones except the permits approved by the PA committed. **ICE** fishing during winter by making holes in the frozen surface of the lakes have also regulated. Hunting of birds particularly poaching of coots have been prohibited throughout the year, and offensives are penalized as per the MP of BA.

Promotion of road network and shelter programs around BA and extraction of stone for construction is a concern of degradation of the areas integrity. Illegal utilization of raw material for construction has been reduced in a level, but needs to pursue it accordingly.

Local guest houses organized by the communities living in and around BA have generated sufficient incomes due to increased number of visitors. The shrine in Haibat has refurbished to accommodate pilgrimages and visitors concentration around Haibat Lake, and therefore the threats to Qanbar Lake has also reduced.

The recent report of extraction of construction and surface rocks from the hills around Band-e-Zolfeqar has been depressing. Though, it was banned immediately, but the unfortunate open pets in the area has opened illegal extractions, as the rock deposits are appropriate for walking routs.

Gaps

1. Despite gazettement and implementation of management plan for BA, there is no systematic implementation of the plan.
2. Capacity of park wardens, structure and administrative management has remained a question. Low number rangers to control visitors
3. Lack of regular inspection by the responsible authority and no proper monitoring plan
4. Lack of reporting system by implementing partner
5. Illegal hunting, grazing, fuel collection, rainfed agriculture, constructions and other threats
6. Negligence of Management Plan to guide visitors and use of shuttle bus or non-motorized transport. visitors do not allowed run their ***vehicles*** in any direction. Unfortunately, it is fully neglected, which causes to create small multiple streams down the dam of Haibat
7. There is evidence of ***garbage disposed off*** to the surrounding areas of the lake, and ***waste dumped*** in some parts around the Haibat Lake.
8. No Implementation of decisions made by Band-e-Amir Protected Area Committee (BAPAC)

1.2. Kol-e-Hashmat Khan waterfowls Reserve (Declared/June 2017)

Kol-e-Hashmat Khan has been nominated the only reserve area of Afghanistan in the history of protected areas, where the pre-war protection staff survives. However, the war didn't spare it and took away the ***strict protection***. Under a **water *management system, traditionally in-place*** before war, the lake receives water from Logar and Kabul Rivers in summer months through Joi Mastan (channel). The local community of Bini Hisar had use rights of this water for irrigation, but still maintaining the lake surface as priority. The Sarband (dam that diverts water to Joi Mastan) and the Joi Mastan rehabilitated recently, but **leakages is sited**. The community living on the Joi Mastan dumps all garbage and waste into it. In addition to community of Bini Hisar, the people of Pay Monar of Deh Sabz district of Kabul take whatever little water is available. The Deh Sabz community had no rights over use of the water in the pre-war traditional water regulation system.

The surrounding pre-war agriculture land around the lake is now ***converted to settlements and engulfed by the extension*** of Kabul City. This has resulted ***in***

encroachment on the land of the lake. Houses have been constructed on about 46 ha of its land while, the left over 145 ha of lake area is still under threat from the surrounding community, as the raised value of land due to influx of displaced people is enough reason to grab more land from the lake surface. The local community claims they have purchased the land from other people, and therefore have ownership of it.

In line with its semi-ecological importance, NEPA with the support of MAIL, re-assess the area and provided an interim management plan, provided to prepare the area for declaration as Waterfowl reserve. Kole Hashmat Khan was declared as Afghanistan fourth protected areas in June 2017. The office of Kole Hashmat Khan lead by Directorate of Natural Resource of MAIL, has a range of 12 protection staff consisting of 9 guards and 3 supervisors. Despite all challenges, they have received regulatory powers to control activities posing threat to the survival of the lake, and addressing various issues regarding the lake. Presently, the protection staff is able to ensure conservation of the lake in the long run with the direction given by law and the management plan as a ***regulatory mechanism***, and ***support from the law enforcing*** agencies.

Efforts have been made to prohibit the activities around the lake, such as car wash facilities, livestock markets, shops, cutting of reed, grazing of ships and dumping of solid waste in Kole Hasmat Khan by the local communities living around. Until 2014, these activities were created problems of ***higher productivity leading to eutrophication***, when the lake is bounced back. ***Hunting*** of waterfowl, and ***netting*** of quails has also reduced. Kole Hashmat Khan is evident of thousands of waterfowls visiting in spring in recent years. In the meantime, two observation towers in east and west part of Kole have been constructed to support control lake and conservation education.

This area has been officially declared as waterfowls reserve area in June 2017. A and interim management plan is under implementation. This will open ways to gazette the reserve areas in the coming years.

Gaps:

1. Lack of implementation of Management plan
2. No proper monitoring and inspection
3. No observation inventory system of species visiting the area (seasonal inventory?).
4. Technical Capacity and administrative system has been a major threat to the integrity of the area
5. Land encroachment and missing parts are extremely sensitive
6. Limited public and government support (mostly temporary with no follow up).
7. Increased number of shelters around the kole and water body

8. Increased number of small scale businesses around the area (west, north and east)
9. Lack of public awareness in and around the area
10. Illegal dump of municipal wastes
11. Existing of car washing and use of kole water. Disposal of wastewater into lake is a major issues.

1.3. Dasht-e-Nawar Wildlife Sanctuary (No Progress)

The status of a wildlife sanctuary, that was available to the Dasht-e-Nawar Lake, has not been considered yet. During the past decades, almost all mechanisms of protection in this globally important habitat have been neglected due to war and lack of control over the area. The system of seasonal guards, is no more extended and therefore no protection to migratory and resident wildlife is available.

The Nawor Lake was re-visited by a team of conservation experts in 2004, to complete the studies for nomination of wetland to Ramsar Convention, with no success, as ratification of Ramser Convention has been pended by the government. Dasht-e-Nawor has been recognized the habitat of Flamingo with the highest number and breeding site. Large number of ***ducks and waders along with greater flamingo (Pheonicopterus rubur roseus)*** visits the lake and large number of demoiselle cranes rest in the grassy plain. There is a **marshy *area with numerous small freshwater ponds*** on the western side of the lake. This marshland, created by the springs and flow of water from mountain streams to the depression spread over an area of 4 km^2. This marsh and the ponds play an important role in maintaining breeding populations of waterfowl and other water birds. The fresh water ponds are home to a ***cyprinid fish species***, which is abundant here. This small sized fish of 8 to 10 inches in length, is found in two colors, black and grey (khaki).
The Post-Conflict assessment mission of UNEP (UNEP 2003) reported the fish species for the first time. A small population of ***Himalayan ibex (Capra ibex)*** inhabits the mountains around the plain to the west. The Safed Koh Mountain having highest elevation of 4800m in the area is considered prime habitat of the ungulate here. Lack of management resulted an irresponsible construction on the outlet of water source of wetlands. This has led to a reduced water to wetland. The Provincial Reconstruction Team in Ghazni province contracted construction of a dam on the **Sardarakht** stream. The dam, which has been already completed, stores around 1 million cubic meter of water and create a ***reservoir of about 1 mile***. While the reservoir created by the dam has provided habitat to waterfowl and other water birds and might contributed to sustainability of the marshland in the plain through continued flow during dry months of the year from the stream, but changes in migration and habitat system in medium and long term is of concerns. There is a small hydro power station besides a watermill on the **Sardarakht** stream, which is owned by a person from the Naw Deh village. He supplies electricity to people in the surrounding villages and charges 20 Afghanis a month for each bulb/tube light.

The local community, heavily depend on agriculture and livestock, ***hunting of ibex*** and ***poach waterfowl*** for meat during molting season, when it is easy to catch birds. This indicates that waterfowls and other water birds still breed in the area. The local community collects ***compact grass "Jam"*** from the plain. This is considered a very good biofuel and every household collects enough for the winter months. However, reports indicate its export to ***Ghazni area for selling*** as well. Collection of Jam enhances seepage and provides depressions that are converted to small ponds and thus a habitat for water birds.

Despite illegal interventions of surrounding communities into wetland, habitats, water birds and other animals in surrounding mountains, there is a traditional and religious value of protection of flamingo and its breeding site. Works are going to enrich the value through different channels of public awareness including mosques and religious scholars.

Gaps

1. Security and lack of law enforcement
2. Afghanistan has not accessed to ratify Ramsar Convention on wetlands and international treaty for transboundary wetlands conservation.
3. No obligatory works to access Ramsar Conventions on Wetlands to complete the criteria and nominate Nawor as Ramsar Site
4. Lack of update information

1.4. Aye Khanum, Darqad Natural and Cultural Site (Identified)

The site of Aye Khanum in Dasht-e-Qila has a ***variety of habitats*** consisting of Amu River Marshlands with thick reed-beds and small ponds, grassy meadows, and forested island. This variety of habitats creates an ***edge effect***, which is important to maintaining biological diversity. The site falls on the migratory route of the Siberian-Kazakhstan/Pakistan-Indian population of the migratory birds, ***supports a number of bird species*** and ***provides re resting, feeding, staging grounds*** and may ***breeding grounds*** also. The open river water provides feeding grounds to various duck species, among which the ADB mission observed mallards (80), shovellers (4), common teals (50), and gadwalls (10). The marshland may be inhabited by a variety of water birds, wherein ADB mission observed coots. The ponds provide habitat to coots, common teals (24), and mallards, while may be used by a variety of waders. Among waders present were black-winged stilts (8), redshanks (6), godwits (2) and northern lapwings (6). The local community reported resting of demoiselle and Eurasian cranes during their migration seasons. The ADB mission observed a flock of 8 Eurasian cranes over-flying the area. Other birds that are common in the area include Eurasian marsh harrier, hen harrier, fishing eagle, rock pigeon, and green bee eaters. The local community and the border police personnel

reported occurrence of Bactrian deer, and hare. During a walk through the forests on the island, the mission observed a pheasant (*Pheasianus colchicus*) there.

The Aye ***Khanum (or Aali Khanum) archaeological site*** is located at the southern end of the site, which has historical bearings in the area. This site, although ***highly abused*** during the war periods, is a cultural and historical asset of Afghanistan. Located opposite to the Burkush Mountain of Tajikistan, at confluence of the Kukcha River and Amu Darya, it is narrated that people of Alexander the Great built it in 200 B.C. The site served one of the important archeological sites, and was controlled by the government. During the war periods, the warlords ***excavated every nook and corner*** of this site to plunder antiques.

Sas Kol Bandar (port) is located at southern end of the wetland, where some trade exchange between Afghanistan and Tajikistan takes place. A post of border police exists here for controlling trade and any illegal activities along the border. The local community ***collects reeds*** from the marshy area of the wetland site for domestic as well as commercial use. The forests at the island are not only inhabited by some people, but also provide them with fuel wood and timber. There was evidence of cutting these forests***.*** A large number of ***Livestock grazes*** in the reeds and grassy meadows all over the wetland site.

There have been a number of field visits and assessments by the author and a number conservation experts in the past six years. All preparatory works have been completed to declare the area as ” **Aye Khanum Natural and cultural heritage site”**. Due to security reasons, the plan pended for near possible future.

1. Security and lack of motivation in the area
2. Lack of rules in consideration of trans-boundary conservation mechanisms
3. Lack of government interest
4. No local human capacity

1.5. Weghnon lake and Landscape Site (Identified)

Weghnan is a ***freshwater high altitude lake*** located in middle of the Mian Shahar Valley of Worsage district of Takhar province. The lake is a source for the Mian Shahar River that drains in Mian Shahar and its various sub-valleys through tributaries. The width of the lake is about 800 meters at the widest points. The lake is resting and staging ground to a variety of water birds, and may probably serve as breeding ground also. The first ecological reconnaissance of Weghnan lake by the author (Ghulam Mohd Malikyar and Ahmad Khan) happened in mid October 2005 under ADB environment project (end of migration season) observed 30 mallards, and 13 gadwalls and 35 common teals, numerous white wagtails feeding on the lake side, heard chakor partridges (*Alectoris chukar*) all sides and recorded call of a snowcock (*Tetraogallus himalayansis*). The local community reported occurrence of a fish species, which they catch with hooks in winter

months to subsidize their livelihood. Himalayan ibex (*Capra ibex*) is also reported from the area, particularly the Yaghzu valley, to the left of the scree base at mouth of the lake.

Mian Shahar Valley, where Weghnon Lake is located has a population of around 10,000 and mostly Dair speaking Afghan. Almost 98% of population, dependa on subsistence agriculture and livestock raring. There are only 2% of the people in service and small-scale business sector. Males and females along with their children work for their family livelihood. The local community grows various ***fruit plants*** including almond, apricot, peach, and cherry. However, they ***lack training*** in pruning and proper tending of fruit plants. Every village has council led by head of the village "Malik". They hold its regular meetings, and decide development issues with the government and other organizations. The ***Agha Khan Foundation*** and ***CONCERN*** are actively working in the area in the development sector and have emphasized on construction of schools, clinics, and bridges. The ***National Solidarity Program (NSP)*** has also beem active in the valley during the study, and implemented its development schemes through the village councils. A 20-bed hospital at Warsaj and two clinics at Mian Shahar and Khanaqa provide health services to the community. The ministry of health has trained 15 people in the valley in basic medicine and health. Four schools in the valley serve educational needs. There are middle and primary schools in the Mian Shahar Valley, while a high school in the Khanaqa. The education provided in the area is affected by shortage of teachers and education materials. Health and education facilities are still very remote to the 400 households living in seven villages upstream the lake.

The author[6] has been witnesses of netting small birds and sparrows in the valley. It was also confirmed by local community in large numbers year round. Fishing in the river and ice fishing during winter in the lake is another activity that local people and outside districts and villagers people do it for food and game. They do ice fishing by making a hole in the frozen lake surface with an axe. The local community hunt ibex, even in the breeding seasons. Reaction to the ban on hunting announced by the Presidential decree has lower impact. Enforcement of decrees is extremely important to stop illegal hunting in the valley. The local community is very hospitable, and receptive to outside initiatives. Being a high altitude area, winters are severe while summers are pleasant. The local community meets their fuel wood needs from the Juniper forests, which are very thin in the area, and the plantation on the valley floor. This need has realized them the value of plantation, and therefore have grown thick forests of willow, popular and plantain all along the valley floor.

To reduce the threats, it is recommended to act for rectification of situation and conservation of this lake/sites in Takhar province of Afghanistan. Implementation of the objective to enact as protected lake and to include the lake in the national

[6] Malikyar Ghulam Mohd/ 2015

protected areas network in the country. It is expected that this will lead towards establishment of an effective lake chains in Afghanistan for conserving biological diversity of the country and benefit of the local communities living in and around these areas. It is a landscape lake for "ICE FISHING" in winter.

Gaps

1. Limited local capacity and structure for timely and permanent monitoring, security and public awareness

1.6. Abe Estada and Hamoons (No Achievement)

Ab-i-Estada ("standing water"[1]) is an endorheic salt lake in Nawa District, Ghazni Province, Afghanistan. It lies in a large depression created by the Chaman Fault system in the southern foothills of the Hindu Kush, 125 kilometres (78 mi) south-southwest of Ghazni. In modern times the lake has been reported to have a surface area of 130 square kilometres (50sq mi), although it dries out periodically.[1][3] It is very shallow, not exceeding 3.7 m (12 ft) in depth.[4] There are two small islands near the lake's southeastern shore, Loya ghundai (2,500 m^2 (27,000 sq ft)) and Kuchney ghundai (500 m^2 (5,400 sq ft)).[2] The water is highly alkaline and mass die-offs of freshwater fish from the Ghazni River sometimes occur.

The main inflows into Ab-i Istada are the Ghazni, Sardeh and Nahara Rivers, which drain into it from the northeast. The watershed draining into the lake covers 17,252 square kilometres (6,661 sq mi) and was home to over 1.8 million people in 2003. Three sets of raised beaches surrounding the lake have been noted at 2–3 m (6 ft 7 in–9 ft 10 in), 6–7 m (20–23 ft) and 9–10 m (30–33 ft) above the normal lake level. At high water levels, the lake is known to overflow into the Lora River, a tributary of the Arghistan River, through two channels on the south side of the lake, Akasi Mandeh and Sekva Mandeh. A groundwater connection between the lake and the Lora drainage has been suggested.

Historically the area around the lake was unpopulated, although nomads from Kandahar visited it in the summer. More recently, the Tarakai have settled near the lake: in 2003 there were eight villages within 10 kilometres (6.2 mi) with a total population of approximately 5000. Economic activities around the lake include trapping of saker and peregrine falcons, grazing and collection of fuel wood.

The wetlands around Ab-i-Estada attract a variety of migratory birds, over 120 species having previously been recorded. Babur observed enormous flocks of greater flamingoes at the lake; their numbers in recent years have varied between 0 and 9000. The wetlands were once a critical stopover for the central migratory population of Siberian cranes, but these have not been sighted at the lake since 1986. In 1974, the Afghani government proclaimed a Waterfowl and Flamingo Sanctuary around the lake, causing considerable resentment among the locals; conservation efforts ended with the Soviet invasion in 1979 and have not been restarted since.

Gaps

1. Security, limited access and lack of observations
2. Droughts (likely)
3. Lack of local environmental administration
4. Lack of coordination

4.7. Hamuns (No achievement)

Lake Hamun or Daryacha-e-Hamun is a term applied to wetlands in endorheic Sistan Basin on the Irano-Afghan border. Hmaun is generic term which refers to shallow lakes (or lagoons), usually seasonal, that occur in deserts of southeast Iran and adjacent areas of Afghanistan and Pakistan as product of snowmelt in nearby mountains in spring. The term Hamun Lakeis equally applied to Hamun-e Helmand(entirely in Iran), as well to shallow lakes Hamun-e Sabari and Hamun-e Puzak, which extend into territory of present-day Afghanistan with latter being almost entirely inside Afghanistan. The Hamun is fed by numerous seasonal water tributaries; the main tributary is the perennial Helmand River, which originates in Afghanistan Hindu Kush mountains. In modern times, and prior to the existence of the dams for agricultural irrigation, spring floods would bring into existence much larger lakes.

It is located in Afghanistan which forms on the Sistan marshes west of the Dasht-e Margow desert where the Helmand River forms a dendritic delta. Water flows in a circular fashion through a string of lakes starting with Hamun-e Puzak in the northeast, sweeping into Hamun-e Sabari and finally overflows into Hamun-e Helmand in the southwest. It used to cover an area of about 4,000 km^2 (1,500 mi^2) with dense reed beds and tamarisk thicket fringing on the edges of the upper lakes. Area was thriving with wildlife animals and migratory birds.

A trapezoid shaped basalt outcropping, known as Mount Khwajah, rises up as an island in the middle of which used to be Hamun Lake and the northeastern edge of Hamun-e Helmand. Its flat-topped peak rises up 609 meters above sea level with a diameter 2-2.5 km, being the only remaining natural uplift in the Sistan flatlands.

Gaps

9. Afghanistan has not accessed to ratify Ramsar Convention on wetlands and international treaty for transboundary wetlands conservation. Three of the mentioned wetlands and lake can be possible nominee for Ramsar Sites.

4.8. Salang Mountains Snow Melt Water Body (identified 2015-16)

This reserve has located on the top of Salang mountain and just over the current tunnel toward south Salang. The elevation of the reserve is around 2945 meter above sea level. While small, the pond is recognized as autumn snow melted water body. Few water bird visit the site and the outlet is to Salang river. The pools and lakes sit around 2,900m above

sea level in the crater summit of the mountains. Most of the year it is frozen, but sometimes melts during the summer to form an icy pool. They are rare sight, due to its height and frozen nature most of the year round, but is worth the climb to see. These lakes were explored by a team of NEPA in recent years.

The reservoir can make a network of mountain top lakes along with Weghnan lake[7], Warsandan lake[8], Dara-e-Arzo snow melted Pool, and Hawz Lalan[9].

2. Threats /Pressures

Traditionally, wetlands in Afghanistan has been used as water reservoir, traditional fuel collection and in other words means of fishing and hunting areas. Early attempts to develop policies to focus more on the available protected areas and national park is an essential initiatives. Lack of capacity in the government and priorities to such areas have over graded the pressure on these areas. Returning of refugees, resettlement and shelters for a double population density in and around wetlands which is still unprotected. Main threats to wetlands in Afghanistan is as follows:

1. Conversion into agricultural lands. This has resulted loss of thousands of hectares of wetlands
2. Encroachment and convert to residential areas
3. Water conversion for irrigation and other purposes
4. drought and decrease water table
5. grazing and fuel collection
6. lack of policies and regulations

3. Impacts

Afghanistan's wetlands are obviously important from many means. Yet, there is a thought that wetland is wasteland, while these area support human live in a variety of reasons and wildlife that makes the ecosystem as better as it is. Since wetlands have many functions that are virtually important to the quality of lives and do one or more functions. When a wetland area is degraded, the following obvious impacts are expected:

1. loss of groundwater recharge
2. decrease in natural flood control system
3. Rapid water contamination, pollution increases and lack of natural control
4. loss of food sources and recreation
5. decrease in environmental stability and many others

[7] Located in Warsaj district of Takhar province
[8] Located between Bamyan, Bamyan and Parwan provinces.
[9] Located in Onaba District and Dara Districts of Panjsher Province

4. General Gaps and Challenges of Wetlands

The fundamental challenges are ecosystem degradation in the country. Wetland ecosystem contains vast ranges of interdependent plant, animal and micro-organism that support all life. This genetic of ecosystem come under threats through a combination of habitat destruction and the selective removal and killing of species. This may leave the following challenges:

- As major requirement for the identification of wetland ecosystem, systematic studies of wetlands including oligotrophic lakes and eutrophic lakes has not been undertaken.

- Low capacity of wetlands governance body in the ministry of Agriculture, Irrigation and livestock is an issue that has not been considered to supervise the wetlands ecosystem, its floral and faunal characteristics

- Lack of enforcement of legal framework and legislation for wetlands/lake ecosystems

5. Progress

There has been little activities with regards to wetlands conservation and protection. A number of potential wetlands re-assessed in the recent years (2003-2017). No practical steps have been taken to maintain this ecosystem.

6. Recommendation

1. An overall study/assessment including identification of oligotrophic and eutrophic water bodies in Afghanistan
2. identification and assessment of wetlands that has not been studied in the past including their physical and natural status
3. Development of wetlands ecosystem regulation under the environmental act
4. socio-economic studies of the population living in and around wetlands
5. protection of floral and faunal

2. National Parks and Protected areas

Protected areas are important tools in maintaining promoting biodiversity and cultural resources of a locality. Degradation of resources has accelerated in the past few decades all over the world due to exponential population growth, growing demands for food and shelter, and rapid technological extravaganza. Though emerged in the west about 100 years ago to protect scenic and aesthetic places for recreational purposes, protected area are playing a major role in maintaining originalities including genetic resources, meta populations, and significant cultural and heritage properties. In some cases protected

areas have proved very important to socio-economic development of local communities through sustainable resource use, and promotion of eco-tourism.

Afghanistan has a series of potential conservation areas at the provincial level that can be protected as protected areas and designate as national park, wildlife reserves, sanctuaries, and conservation areas. The five important conservation sites that have been identified before the war, one national park of Band-e-Amir, Ajar valley (wildlife reserve) in central Afghanistan, two waterfowl habitat of Ab-e-Estada and Dasht-e-Nawor southwest, Afghan Pamirs (the habitat of Marco Polo sheep, snow leopard and 15-17 other mammals in the northeast and Kole Hashmat Khan shallow lake in Kabul). A number of other potential areas exist that need further studies and assessment to be declared as protected areas and possible management as well.

The recent assessment/studies of some of these important areas in Pamir, Ajar valley, Band-e-Amir, Ab-e-Estada, Dasht-e-Nawor, and Kole Hashmat khan indicates degraded conditions of these wildlife and waterfowl reserves.

1. State of protected areas

In earlier 2003, steps to re-designate the potential areas as protected areas and wildlife reserves are in process. Some of the areas have been comparably re-studied. Management and action plan for those areas with highly potential has been completed and steps to finalize its declarations are in hand. Afghanistan is signatory to almost 13 Multilateral Environmental Agreements, and four chemical protocols. Legal and institutional instruments to address environment, conservation and threats to biodiversity including wildlife trade issues have been setup and enforced . However, the illegal wildlife trade has recently become more serious. Despite creation of legal frameworks, policies and storing strategies to reduce the trend of wildlife threats and trade, the trend of informally organized network for degradation of wildlife assets have left ever growing pressure as demand has increased and the traders have motivated to use sophisticated system for transporting consignment. Internal drivers has created regular network with external drivers and cross-border and illegal trade has become more common. The examples of such networks are an extensive trapping of falcon in almost all desert areas, houbara bustard in the southwest and snow leopard northeastern and central mountains in Afghanistan.

Moreover, there has been training of custom officers, and media journalists by NEPA with technical support from UNEP and Wildlife Conservation Society, in different range of years, which had positive impacts, but is likely low, since lack of awareness among the population and authorities is large. Efforts have made to maintain close coordination mechanism to involve concerned agencies including customs, police, postal services, scientific authorities and national and international conservation organizations working in Afghanistan, yet the need of stronger coordinate is required. It is clear, unless action is taken to address international demand, the curbing of illegal wildlife trade will be extremely difficult, if not impossible, without the setting up of a coordination mechanism. Evidence of illegal trappers, hunters and trade in Afghanistan shown, that if there is support to build a strong coordination and commitments, Afghanistan will fulfil its mandate and commitments to the MEA and related treaties.

Yet, there is large gap and negligence in the implementation of environment act and subsidiaries throughout the country. Any person can kills, injures, purchases, sells or transport wildlife and body parts at an unlawful manner. Snow leopard, common leopard, musk deer, falcon, houbara bustard and cranes and the fur of different animals, while punished by law, but still is high. Lack of coordination between government and organizations has made the trend extensively large. The focus of these trend is in bordering provinces, which most of illegal dealers are active using the poverty trends of population there. Lack of cross-border cooperation is another issues that Afghanistan has been in the picture yet. Though, the government with the support of donors and other agencies (ADB, UNEP, and USAID) projects has initiated community based natural resource, protected areas and wildlife management in central and northeastern part that can be an obvious steps toward protection of the resources, but much efforts are needed to cover all potential areas.

Although the issue of wildlife trade goes beyond the boundary of a single country, interventions and enforcement by Afghan government has been minimal. Limited government resources for addressing key protected areas and wildlife issues are concerned. Wildlife trade monitoring is an other challenge that has not been carried out yet.

2. Wakhan National Park (Declared 2014)

Wakhan is the narrow strip of territory in northeastern Afghanistan that extends to China and separates Tajikistan from Pakistan. The corridor, wedged between the Pamir Mountains to the north and the Karakoram range to the south, is about 350 km (220 mi) long and 13–65 kilometers (8–40 mi) wide.[1] From this high mountain valley the Panj and Pamir Rivers emerge and form the Amu Darya. A trade route through the valley has been used by travelers going to and from East, South and Central Asia since antiquity. The term "Wakhan Corridor" can also refer to this constituent valley and the historical trade route through it. The closure of the Afghan-Chinese border crossing at the Waghjir Pass, on the east end of the Wakhan Corridor, has left the valley bereft of trade.

Although called Wakhan National Park, it will be managed as an IUCN Category VI protected area, termed a “Protected Area with Sustainable Use of Natural Resources” which is intended to protect natural places, together with associated cultural values and traditional natural resource management systems. Wakhan National Park subsumes the previously proposed Big Pamir and Teggermansu Wildlife Reserves and the management plan replaces the plans for the two reserves.

The plan describes the land, animals and people of Wakhan National Park and provides management direction for the period of 2018–2022. The document is structured as two separate documents that can be read independently. Part 1 is a detailed account of the environment and people of Wakhan National Park along with a summary of current initiatives and conditions in the Park. Part 2 is the management plan itself describing the vision, goals, governance, zoning, prohibitions and proposed management actions.

Readers interested only in the management plan are invited to check full management plan available in NEPA.

Wakhan National Park is a long (295 km), narrow (17–60 km) strip of land, 10,950 km^2 in size, with elevations ranging from 2,512 m along the Panj River to 7,492 m at Mount Noshaq, Afghanistan's highest peak. The Pamir, Hindu Kush and Karakorum Mountain Ranges all meet in Wakhan National Park and form the source of the Amu Darya River. The Park is bordered by Tajikistan, Pakistan and China.

The ecology of Wakhan National Park is governed by its high elevation with 59% of the park area comprised of barren ground and another 14% covered in glacier. The most common vegetation types are *Artemisia* Cold Desert and Alpine Grass. Twenty-five species of mammals and 250 species of birds have been reported from the Park. Snow leopards and Marco Polo sheep or argali, are the most charismatic Wakhan species, but the Ladakh urial and the Large-billed Reed Warbler may be the rarest.

Humans have probably hunted in the Wakhan Corridor intermittently and seasonally for at least 10,000 years and the Wakhan Valley has been farmed since the 1st century CE. From about the 2nd century BCE to the 14th century CE, the Wakhan comprised one of the many Silk Road trade and cultural exchange routes from the Taklamakan Desert, in present-day Xinchiang Province, to the West. Currently, the Wakhan Valley is occupied by about 15,000 Wakhi people while the eastern Big Pamir and Little Pamir are home to 1,250 Kyrgyz people. The Wakhi are agropastoralists while the Kyrgyz are semi-nomadic pasturalists.

3. Ajar Valley Nature Reserve (No achievement)

The area has been nominated as wildlife reserve and protected area in Afghanistan, located in Bamyan Province. It was designated a nature reserve in the early 20th century after the Afghan royal family had used the area for hunting. It is considered by the IUCN to be one of the most important natural areas of Afghanistan and was proposed for a national park in 1981. Poaching is still a problem in the valley and protection has been implicated by war. Especially threatened is the ibex population.

Progress

A number of scientific, socioeconomic and human resource assessments of Wakhan corridor after 2002, occurred by an ADB technical assistance, UNEP post conflict, and NEPA/WCS in Wakhan Corridor. Theses assessment provided technical justifications to prepare the areas for protection in accordance to national and international classifications.

In 2014, the National Environmental Protection Agency declared the entirety of Badkahshan's Wakhan District as a National Park. Wakhan National Park is characterized by unique high elevation biodiversity, deep history, rich cultural diversity, and magnificent alpine scenery.

The Vision for Wakhan National Park is "Abundant biodiversity and sustainable use of Wakhan's natural resources leading to better livelihoods for the local Wakhi and Kyrgyz" and the long-term goals are:

Setup specific goals to protect and restore wildlife populations, especially snow leopards, Marco Polo sheep and 17 other mammals. Ecosystems of Wakhan Corridor is unique that should be protected.

Wakhan National Park is divided into seven separate management zones; three Strict Protection Zones (21% of Park area), three Conservation Zones (75% of Park area), and one Settlement Zone (4% of Park area). A Buffer Zone, outside of the Park, corresponds to 79% of Ishkashim District.

Under provisions of the Environment Law, the National Environmental Protection Agency has ultimate responsibility for protected areas. The task of managing protected areas has been delegated to the national office of the Ministry of Agriculture, Irrigation and Livestock. Wakhan National Park will be managed collaboratively through the Wakhan National Park Protected Area Committee comprised of community and government representatives.

Gaps

1. Lack of timely monitoring of progress
2. Lack trained staffs
3. Lack of capacity in implementing partner
4.

4. Shah Fooladi Landscape (declared)

Shah Foladi area is a landscape of outstanding natural beauty. It forms part of the Koh-e Baba mountain range, which stretches over Bamyan and Wardak provinces in Afghanistan's central highlands. Standing at an impressive 5,050 m high, the Shah Foladi peak is the crown of the Koh-e Baba mountain range. The area exhibits a diverse range of habitats, species, and human settlements, and along with the nearby city of Bamyan, famed for its UNESCO World Heritage Cultural Site. This mountain range is the geological and geomorphological core of Afghanistan's Central Highlands.

The Shah Foladi area is a glaciated landscape with abundant cirques, glacial lakes, moraines, sharp ridgelines, pyramidal peaks, and U-shaped valleys. The mountains are the birthplace of all of Afghanistan's most important watersheds. The numerous alpine lakes, glaciers and extensive pastures, store water and release it throughout the year, feeding creeks, canals, and rivers throughout the entire country. Water originating in the Shah Foladi, and the wider Koh-e Baba mountain range, feed five of the major river systems in the country, the Hari-rud, Helmand, Kabul, Kunduz, and Balkh rivers. The Kunduz and Balkh rivers eventually feed into the Amu Darya before flowing directly to the Aral Sea.

The Shah Foladi area has a harsh and challenging high-mountain climate, with long winters, limited growing seasons, and marginal mountain soils. Despite these environmental challenges the landscape harbors an impressive diversity of fauna and flora. The rangelands, a carpet of rich floral diversity throughout the spring and summer, are a haven for endemic plant species and are an important resource of fuel, food, livestock fodder and medicine for resident human populations. Despite a history of

persecution and hunting, there remains a great diversity of wildlife, including species such as gray wolf (*Canis lupus*), red fox (*Vulpes vulpes*), European lynx (*Lynx lynx*) among other wild cats, Siberian ibex (*Capra Sibrica*), urial (*Ovis orientalis vignei*) and more than 110 species of bird. Historically, Persian leopard (*Panthera pardus ciscancasicas*), brown bear (*Ursus arctos*), and wild boar (*Sus scrofa)* inhabited the area, but no records exist from recent decades of the presence of these species.

The following document provides information and justification for the legal designation of the Shah Foladi National Protected Area as Afghanistan's third protected area as stipulated in Article 42(2) of Afghanistan's Environment Law. The proposal to designate Shah Foladi includes the following elements:

- Justification for the establishment of the protected area and the category of protection proposed. This will include the objectives for the national protected areas as well as an evaluation of the advantages and disadvantages of establishing the protected area;
- A physical survey of the proposed protected area;
- A socio-economic survey of the local human population with a description of the traditional uses of natural resources in the area proposed for designation and the potential impact of each category of protection provided in Article 40;
- A report on collaboration with central and local relevant government departments and local communities, in determining the boundaries and category of the area proposed for designation.
- Comments and suggestions from relevant ministries, central and local relevant departments and local communities concerning the proposed area and designation of the protected area.
- A description of any compensatory measures that may need to be taken into consideration as a result of establishment of the protected area.

For the Shah Foladi to be internationally recognized as a protected area, it should meet the International Union for Conservation of Nature (IUCN) definition for protected areas:

> "A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."

Term by term, the Shah Foladi meets the criteria defined by the IUCN for a protected area in the following aspects:

- DEFINED SPACE: the Shah Foladi has clearly defined natural boundaries created by the valleys and peaks it encompasses within the larger landscape of the Koh-e Baba mountains. The watershed's boundaries are naturally defined by ridges and a core buffer area.
- RECOGNIZED: from both ecological as well as cultural perspectives, the Shah Foladi is widely recognized by government, civil society, and intra-governmental organizations as an area important for conservation and management.
- DEDICATED: the people of the Shah Foladi are dedicated to conservation and this is supported through provisions within the Environment Law.

- MANAGED: the Shah Foladi is actively managed for conservation by the local communities and government.
- LONG-TERM: community-based conservation management in Shah Foladi is established with no foreseen end date.
- CONSERVATION OF NATURE: local communities and government have proved they are effective at protecting Shah Foladi's natural resources;
- CULTURAL VALUES: future management of Shah Foladi places emphasis on protecting the unique cultural and historical values of the landscape.

In summary, the Shah Foladi meets all of the criteria put forward by the IUCN to be internationally recognized as a protected area.

List of Protected and Proposed Protected Areas and National Parks

Protected and proposed National Parks and Protected areas of Afghanistan											
Name		**Location**		**Area/ha**	**Last assessment**	**Altitude**	**Designation**	**Category of IUCN**	**Status**		**Remarks**
		District	**Province**						**Protected**	**Proposed**	
Band-e-Amir		Yakawlang	Bamiyan	41000	2006 2009	2900	National Park	II	√		
Kole Hashmat khan		Dist.8	Kabul	191	1973	1792	Waterfowl Sanctuary	IV		√	Final Appraisal
Pamir-e-Buzurg		Wakhan	Badakhshan	67938	1978	3500-6500	Wildlife Reserve	IV		√	Final Appraisal
Dasht-e-Nawar		Nawar	Ghazni	7500	1977	3200	Waterfowl Sanctuary	IV		√	R-A*
Abe-e-Estada		Nawa	Ghazni	27000	1977	2100	Waterfowl Sanctuary	IV		√	
Ajar valley		Kahmard	Bamiyan	40000	1978	3000	Wildlife Reserve	IV		√	Final Appraisal
Shah Foolady		Bamiyan	Bamiyan	45000	2009	5020	Protected Landscape	V		√	Final Appraisal
Little Pamir	Tigar Manso	Wakhan	Badakhshan	16650	2011	4000-5000	Wildlife Reserve	IV		√	Final Appraisal
	Waghjir	Wakhan	Badakhshan	16650	2012	4000-5000	Wildlife Reserve	IV		√	plan for 2017
Hamoon-e-Pozak		Kang and Chaghansor	Nimroz	35000	1977	1620-1731	Waterfowl Sanctuary	IV		√	
Imam Sahib		Imam Sahib	Kunduz		1977	1900-2095	Wildlife Reserve	IV		√	
Hamoon-e-Saberi			Farah and Nimroz		1978		Waterfowl Sanctuary	IV		√	
Darqad		Darqad	Takhar	120000	2013	400-500	Wildlife Reserve	IV		√	Final Appraisal
DashteRegistan		Rig	Kandahar		N A	800-1200				√	R-A*
Nooristan			Nooristan		N A	6293				√	Information not yet Completed
Kholm Land Mark					N A					√	Information not yet Completed
Under process											
* R-A on going Re- Assessment											

5. Traditional Values to Protect the Areas

Traditional Knowledge of protected areas and wildlife Conservation

For the natural and historical heritages, there are specific views within the specific communities. Traditionally, sites either natural or historical that should be protected has specific options in many means. It can be declared as sacred or holy sites, community property, site of specific holy species of plants, birds or animals, an historical area that God messengers especially prophet Mohammad (POH) has prayed, rested or crossed. These areas then become religiously modified as protected site. The significant issue is that such areas have been strongly protected rather to the areas that modern or scientific protection process has been implemented. The examples of these area can be sacred forest, lands around pilgrimages, and even the animal or plant species in that areas. Primarily, these type of protection has spiritually transferred to next generations. Such knowledge was in the form of presidential decrees, national regulation using indigenous and religious recognition assets and most the time using power. These were applied for the protection of the resources in the past. The war and conflicts then reduced these values to negligence and carelessness. Areas where regulated bylaw, areas of religious values, areas with cultural values, communal properties, and areas where has shown miracles in due long have been protected locally.

As far as bird protection is concerned, over 450 birds have been reported from Afghanistan and over 150 species of birds is believed in central mountains. The country is located on a major flyway during the spring and autumn migrations for a large number of birds such as storks, cranes, starlings, and numerous species of waterfowl and waders, which migrate from their wintering grounds to northern latitudes in spring. The chokker, Himalayan snowcock, choughs, ravens, eagles and buzzards, together with vultures are some of the more characteristic birds encountered in the Hindu Kush valleys. Kestrels are by far the more abundant raptors of this zone.

Traditional knowledge for bird protection in Afghanistan has been rich, but the negligence and lack transfer tools has been weak. Only few species of birds are to be trapped or hunt. Out of domestic birds, local people classified birds into four categories; (i) desert birds; (ii) jungle birds; (iii) wild birds; and (iv) house birds. Hunting of desert birds are common except in breeding seasons (fair of GOD rage). Such hunting happen early in spring. Hunting of jungle birds happen in all seasons including winter. There is no knowledge of breeding season. Trapping of wild birds happen in winter. These birds are normally kept in cages for long times. Some for game and fun, some for sing and sale. Good species are keeping for fun and enjoy. House birds are those who nest, breed, and feed in the house and inside walls. Protection of these birds are a common sense. They protect these birds spiritually. This feelings of protection keep around 15 species of birds with in-touched manners. Even killing the insects and reptiles around the houses who does not seems dangerous to humankind are forbidden. Local people call Nazari (Ever sight) creatures. Also, a number of birds who's meat are prohibited in Islam is not allowed to prey. Out of domestic bird keeping business, that have profiting base, people like to keep others for fun. Sing birds are very important.

4.1 Knowledge of Wildlife protection

Existing of wildlife encompasses large geographical areas in Afghanistan. Wildlife communities are described generally in terms of dominant species, significant secondary species and understory species.

In the opinion of people, wildlife are those that found in mountains, jungle and desert areas. An extensive feelings of fear among people exists. In rural area hunting of wildlife is only for fur and in retaliation to domestic animals attack. They just follow the animals in residential areas. People does not make serious killing because of fear and attack of wild animals. During the last 37 years the only preservative sense in inaccessible area were concerns of landmines. Similarly, in mountainous areas, killing of wild animals are only in retaliation to livestock killings. People has serious look to its livestock. In case tracks of wild animals are seen, a group of hunters from among the people guarding their livestock and looking to find the track of wild animal. They response to wild animals during attacks. No accustomed killing of wild animal proves. Earlier during and after the war, mutations of fur dealers have become stronger. Extensive attacks on fox spreading all over Afghanistan is common because of skin and in retaliation to domestic poultries. Dog keeping for protection of livestock, domestic birds are common and game. Small group of people keep monkeys for fun and game to make livelihood.

4.2. Knowledge of Habitat Protection

Wildlife habitat protection is not common. People are not much serious to keep themselves close to habitat protection. It is only for domestic or eversight animals. They never touch the nest or feeding sites of such animals. But for the wild animals the behaviors are different. Any special identification knowledge for habitat features such as feeding and nesting are neglected.

Habitat loss is the principal cause of the present high rate of the species loss in Afghanistan that prevails even to global extinctions and poses a sever threat in all biomass. There is no safe level of habitat loss which would reduce the risk of extinction of migratory and domestic species. Changes in habitat quality is still top. Although, it is less extreme than habitat loss, but affect plant and animal populations. For many species, the consequence of even subtle changes in habitat quality can be confidently predicted. Most of such species is endangered. Habitat fragmentation is carelessly continue. This has increased the risk of extinction by many means. A feasible habitat protection in Afghanistan goes side by side to community alleviation and then creation of Communal Working Group amongst small isolated population in habitat area. It will help to benefit from existing knowledge and habitat requirement.

6. Flora of Afghanistan

Afghanistan is rich in flora. There are representative cosmopolitan plants. The plants distributed through the northern hemisphere, are the pantropic plants. There are man endemic species in Afghanistan while dedemic genus is few. Generally, speaking the families, which are supposed to be most advanced in their respective orders, have many endemic such as composites of Cmponulatae, leguminosae, of Rosals, labiatae of Tubiflorage and Cruiferae of Ghoeadales.

7. Fauna of Afghanistan

The Afghan fauna is characterized by many rare and genetically important species adapted to arid steppe or mountains such as Marco Polo sheep, Urial, Ibex, wild Goat, Markhor, Bacterian deer, black & brown beers, Snow leopard, Feral yak, Red fox, Siberian crane, Greater flamingo, Houbara bustard, Great bustard. Further to the list, there are thousands of waders, ducks and other waterfowls, reptiles, amphibians and wide range of domestic animals. Fish and amphibians are scarce. The large herds of wild asses and Gazelle, which until recent times populated the steppes have been almost exterminated by hunting. Similarly, their predators the Cheetah and Hyena have declined and migrated to other countries.

8. Wildlife Executive Committee

The Afghanistan Wildlife Species Executive Committee, a body jointly established by the National Environmental Protection Agency and the Ministry of Agriculture, Irrigation and Livestock to facilitate the designation of Protected and Harvestable Species Lists. A committee of experts from different institutions, universities and academia assessed various species of wildlife of Afghanistan. The committee present an official recommendations to the National Environmental Protection Agency for enforcement, after a period of working. These recommendations are in compliance with Chapter 6, §47, Items 1-4 of the Environment Law of Afghanistan and assist NEPA in fulfilling its initial obligations under the law. The recommendations have also categorized the species as protected and harvestable species in four groups. The process of declaration of protected and harvestable species, provided opportunities to all stakeholders and the government to maintain strong coordination at the central and provincial level. As a basic tool, there are a number of issues that has not been considered yet. The Committee, composed of representatives from NEPA, MAIL, Universities and others, have agreed on all the evaluations presented in this document below. Species were evaluated over the course of several technical meetings[10].

[10] Afghanistan Protected and harvestable species/Afghanistan's wildlife red list

9. Captive Breeding of Wildlife Species

Captive breeding is the process of breeding animals in controlled environments within well-defined settings, such as wildlife reserves, zoos and other commercial and noncommercial conservation facilities. Sometimes the process includes the release of individual organisms to the wild, when there is sufficient natural habitat to support new individuals or when the threat to the species in the wild is lessened. While captive breeding programs may save species from extinction, release programs have the potential for diluting genetic diversity and fitness.

Environmental law Afghanistan make NEPA responsible to establish captive breading system and in-situ, ex-situ mechanisms to recover or re-breed reduced wildlife species including Houbara Bustard. Efforts were made to engage private sector in the process by setting two centers, one in northern province of Balkh and the other in western province of Farah in 2011 and 2014 respectively. The breeding of endangered species is coordinated by cooperative breeding programs containing international standards by specialized staffs and coordinators, who evaluate the roles of individual animals and institutions from a global or regional perspective. Mechanisms of raring and release of 70% of the breaded species to the wild has been accepted. At the moment, two captive breeding centers in Northern and southwestern Afghanistan are in operation.

10. National Protected Area System Plan (NPASP)

It has been designed to assist Afghanistan in understanding the requirements associated with building a physical network of protected areas and creating the necessary legal, financial, management and development system practices required for the successful and sustainable operation of that network. Afghanistan is currently in a unique situation because the Government can establish its first protected area network and system with few pre-existing conditions and constraints. The Plan is a combination of Afghanistan-specific targets and international best practices that, if successfully implemented, will guide Afghanistan in establishing a functional and balanced protected area network and system. The Plan proposes guidelines on how to *establish* a protected area network that includes a representative sample of Afghanistan's ecoregions, flora and fauna. Specifically, the National Protected Area System Plan of Afghanistan:

The Government of Afghanistan has set a goal for Afghanistan's protected area system to establish a national legacy of exceptional areas, preserving in perpetuity representatives of the nation's biodiversity, and natural and cultural features managed sustainably in cooperation with, and to the benefit of, local peoples. The National Protected Area System Plan provides long and short-term objectives, strategies, and recommendations to achieve this primary goal.

The long-term objectives of the National Protected Area System Plan are:

1. By 2030, provide effective protection on at least 10% of Afghanistan's land area and of the habitat of selected species in these areas;

2. For each established protected area, local people will be effectively engaged in setting management direction;
3. Within 10 years of legal establishment of each protected area, the standard of living of people in and near protected areas will be improved.

11. Protected Areas Network

The Protected Area System Plan uses Band-e-Amir Provisional Protected Area and *some* of the previously proposed protected areas in Afghanistan as a foundation for the *physical protected area network*. The previously proposed areas included in the network's foundation are the Big Pamir, Ajar Valley, Teggermansu, Wakhjeer Valley, and Shah Foladi areas. Biological surveys that have been completed in the past five years and local community work, justify the inclusion of these areas in the network. The Plan also proposes "***priority zones***" – areas within Afghanistan that have been selected as being potentially important for conservation. The Priority Zone Method was devised to guide research efforts to obtain more information on areas potentially important for biodiversity conservation in Afghanistan. Investigation of priority zones will ultimately result in new proposals for protected areas within Afghanistan's protected area network. Using Priority Zones to propose new protected areas will compensate for Afghanistan's current lack of data, especially since fieldwork is difficult in many locations given current security conditions.

In order to strategically implement the long-term objective of protecting 10% of Afghanistan's overall land area, an analysis was conducted to evaluate Afghanistan's ecosystems and prioritize them for conservation. The analysis utilized two levels of ecological land classification: the biome and the ecoregion. Biomes and ecoregions are ecological land classifications that contain distinct flora, fauna, climate, and other ecological features. Ecoregions are contained within biomes and group Afghanistan's ecological features at a finer scale. Afghanistan has 4 major biomes and 17 ecoregions.

The National Protected Area System Plan uses the biome and ecoregion classifications in order to maintain flexibility in the proposed protected area system. Biomes will help Afghanistan balance the protected area system at a larger scale and ensure somewhat equal representation between four ecological divisions. Ecoregions, three or more of which are usually contained within a single Afghan biome, will help refine that balance and ensure balanced coverage *within* the larger divisions. The biome and ecoregion objectives include:

1. *By 2030, provide effective protection to **a minimum of 10%** of the area in each of Afghanistan's major biomes (see section 4.3.1).*
2. *By 2030, provide effective protection to **a minimum of 10%** of the area in each of Afghanistan's ecoregions (see section 4.3.2).*

The nested biome and ecoregion approach provides Afghanistan with flexibility in establishing its protected area system. Afghanistan should attempt to meet the minimum 10% targets at all spatial ecological classifications as it moves towards its long-term objective of protecting 10% of its total land area. However, Afghanistan also needs to take a realistic approach to its protected area system. It may not always be possible to meet the minimum 10% targets in each of the 17 ecoregions even though the law requires that

Afghanistan achieve a balanced representation of its biological systems at the larger biome scale. Using this flexible approach, Afghanistan will ensure balanced protection of flora, fauna and ecosystems within the larger ecological divisions while continuing to strive for that same balance at the finer ecoregion level.

To achieve the target of protecting 10% of Afghanistan's land area by 2030, the National Protected Area System Plan selects eight relatively secure ecoregions to establish short-term strategies to achieve the long-term objectives. The short-term strategies include protecting at least 2% of each of the eight "secure" ecoregions by the end of 2015.

There is not enough information about biomes and eco-regions for new proposed areas to immediately create a protected area in the country. Utilizing priority zones is the best way for solving this issue, conducting research and gap analysis in areas where habitats and biodiversity are still in good condition. Suggestions for new proposed protected areas in the first five years will be considered. Priority zones are those areas that have been defined as a result of gap analysis and have the best chance to be allocated as protected areas. To meet the goals by 2015 in the National Protected Areas System Plan framework, surveys will be conducted, research carried out and consultations with local communities made to better define which priority zones are best for protected areas. At first gap analysis will be done in 8 secure eco regions and afterwards extended all over Afghanistan to cover all Afghanistan eco regions as security permits.

12. Protected Area System

To assist in the establishment of Afghanistan's protected area system, the National Protected Area System Plan of Afghanistan also proposes policy recommendations which cover seven major topics including: legal and institutional framework, staffing a Central Management Authority, financing Afghanistan's protected area system, capacity development in protected area staff, community involvement, coordination with the Afghanistan National Development Strategy, and monitoring and evaluation of the protected area system.

The National Environmental Protection Agency is the primary authority responsible for the development and management of Afghanistan's protected area system (Environment Law §3, §38 and §39). It is recommended that the National Environmental Protection Agency construct, approve, and implement effective regulations to facilitate the day-to-day management of protected areas in Afghanistan. The Environment Law allows for the National Environmental Protection Agency to create such regulations for the administration of a protected area system under §22. It is further recommended that these regulations establish a Central Management Authority (CMA) to administer and manage the protected area system. In order to effectively administer the protected area system, this designated Central Management Authority would require unambiguous legal authority, a simple staffing structure with direct communication pathways, and regulatory guidelines for administering this system. It was recommended that these regulations be in place by 2011.

The designated Central Management Authority would be responsible for developing a financing strategy for Afghanistan's protected area system. The National Protected Area

System Plan recommends that the Central Management Authority, in collaboration with international partners, create Afghanistan's funding strategy in 2010-2011 and immediately begin working on its implementation. Even with diverse sources of funding, the Afghan government will need to plan to support a large percentage of the core management costs and system-wide expenses by 2020.

Presently, the capacity to administer and effectively manage a protected area system in Afghanistan is low. The National Protected Area System Plan recommends that capacity be developed in the designated Central Management Authority by embedding within it an externally funded international expert in protected areas administration to mentor Central Management Authority staff. Any training in the short-term will focus exclusively on protected area staff and most training should occur *within* the country.

The Environment Law clearly states that local communities should be effectively engaged in managing protected areas and receiving both direct and indirect benefits from these established areas. A working group from the National Environment Protection Agency, the Ministry of Agriculture, Irrigation and livestock, the Ministry of Justice and the Ministry of Finance defined and proposed a Contracting method. Later one international advisor and one Afghan legal expert advisor prepared a contract text sample. By using this contract method the Afghanistan government can sign contracts with local communities who are living in and near to protected areas. A Government benefit-sharing strategy has been developed and is being initiated to address this legal mandate. This benefit-sharing strategy is initially being implemented in Band-e-Amir Protected Area and, by 2011 community groups associated with the Band-e-Amir Protected Area Committee should be receiving a proportion of the revenue derived from this protected area. Longer-term revenue sharing objectives recommend that, within 10 years of legal establishment of each protected area, the standard of living of people in and near protected areas will be improved and for each established protected area, local people will be effectively engaged in setting management direction. The National Protected Area System Plan recommends that the designated Central Management Authority facilitate the establishment of at last four new Protected Area Committees by the end of 2015 to coincide with the short-term ecoregion targets.

The environment is considered a crosscutting strategy in the Afghanistan National Development Strategy[11] document published by the Islamic Republic of Afghanistan in March 2009. This document identifies the Ministry of Energy and Water (responsible for Afghanistan's energy and water projects), the Ministry of Foreign Affairs (responsible for international agreements and regional cooperation issues), the Ministry of Economy (responsible for national strategic planning), the Ministry of Agriculture, Irrigation and Livestock (responsible for forestry and rangeland management), the Ministry of Justice (responsible for reviewing and approving legislation related to the environment), and the Ministry of Finance (responsible for allocating budgets and sanctioning development plans according to environmental regulations) as integral to the development of environmental issues in Afghanistan. The National Protected Area System Plan recommends that the designated Central Management Authority and the National Environmental Protection Agency establish quarterly coordination meetings with these six Ministries in order to implement the protected area system plan and enhance information sharing opportunities.

[11] . updated to Afghanistan's National Peace and Development Framework in 2015.

Finally, the National Protected Area System Plan recommends that the designated Central Management Authority develop a monitoring and evaluation protocol to determine Afghanistan's progress in achieving the Plan's goals, objectives, and strategies and complete its first assessment of that progress by March 2012.

Gaps:

1. No proper actions for the implementation of NPASP by NEPA and MAIL due to lack of effective coordination and capacity of IPs.
2. The designated Central Management Authority has been responsible for developing a financing strategy for Afghanistan's protected area system, Unfortunately the item has been neglected.
3. The National Protected Area System Plan recommends that the Central Management Authority, in collaboration with international partners, create Afghanistan's funding strategy in 2010-2011 and immediately begin working on its implementation. In this regards, extremely low actions have taken place.
4. Lack of Afghan government (MAIL/NEPA) plan to support a large percentage of the core management costs and system-wide expenses by 2020.
5. A Government benefit-sharing strategy has not been developed and nor initiated to address the legal mandates.
6. Longer-term revenue sharing objectives recommend that, within 10 years of legal establishment of each protected area. The standard of living of people in and near protected areas has partially improved, but not through the benefit sharing, but from increased number of visitors and small scale businesses around the PA.
7. The National Protected Area System Plan recommends that the designated Central Management Authority facilitate the establishment of at last four new Protected Area Committees by the end of 2015 to coincide with the short-term ecoregion targets. No actions have been in place

13. Agro-Economy Development and its impacts on Biodiversity

Afghanistan's varied topography has created a number of diverse habitat types, with temperature and precipitation changing considerably at different elevations. The species that occupy these habitats are uniquely adapted to their ecosystems and, therefore, vulnerable to the impacts of climate change. Afghanistan is home to more than 700 species of animals and 3,500-4,000 native vascular plant species. Human activity, especially habitat fragmentation, is the primary cause of biodiversity loss, though climate change is expected to become the single largest global cause of biodiversity loss before the end of the century.

Afghanistan has important forest and rangeland resources that help support much of the country's rural livelihoods. These forests and wooded areas are particularly valuable in dryland areas because they provide fuel wood and timber, as well as other forest products such as nuts and medicinal plants. Nevertheless, the trees and plants that make up Afghanistan's forests and rangelands face a number of climate change risks and adaptation challenges as temperatures increase and availability of water resources

decreases. Afghanistan's forests are already severely damaged as a result of decades of deforestation, overharvesting, mismanagement, and drought, and today account for only approximately 1.5-2 percent of the country's total land cover.

After 2002, the Afghan ministry of agriculture and livestock with assistance from USAID have been helping to regrow livestock numbers throughout the country. This was done by providing Afghan villagers training and animals to start with. Over the past decade arable land had increased from 2.1 million hectares to 8.1 million hectares, wheat production to 2.3 million tonnes, nurseries from 75,000 hectares to 119,000 hectares and grape production from 364,000 tonnes to 615,000 tonnes. Almond production jumped from 19,000 to 56,000 tonnes and cotton from 20,000 to 45,000 tonnes, with the saffron yield reaching 2,000 kilograms.

1. Fish species

The country has plenty of rivers and reservoirs, which makes it a suitable climate for fish farming. Fishing takes place in the lakes and rivers, particularly in the Kabul River around the Jalalabad area and in the Helmand River in southern Afghanistan. Fish constitute a smaller part of the Afghan diet today because fish farmers are unable to produce enough fish to keep up with the demands of customers. Most fish and seafood is imported from neighboring Pakistan, Iran and the United Arab Emirates. In recent years, USAID has helped many Afghans in establishing fish farms across the country. There are hundreds of fish farms throughout the country and the largest one is at the Qargha, which supplies fish eggs to the other fish farms. Fish farming has also been launched in the Salma Dam. Freshwater fishes are the most threatened group of vertebrates globally. Major threats to freshwater fishes and other freshwater biodiversity, including habitat modification, conversion of water flow, fragmentation, destruction, introduction of invasive species; overfishing; fishing by poisoned food, electrical shocks, environmental pollution; forestry practice; and climate change. Often species, or biodiversity, declines in response to more than one category of threat, and the real "threat" is the combined or synergistic impact of changes brought about by human activities.

14. Gaps and pressure

In the last 39 years, Afghanistan is known to have been an important venue for illegal wildlife trade. Kabul is believed to be a veiled trade center in the region. Commodities include, fur, musk pods, bear bile, leopard skin and bones, wolf and jackal fur, Marcopolo horn and live animals and birds).

- There is a well-connected nexus for smuggling these commodities linking Afghanistan with Pakistan, India and central Asian republics. Further, Afghanistan's open and porous borders made it an easy flow area. Recent observations of wildlife parts indicate that these parts are kept hide from views and is increasingly being sold and transport to the end users in neighboring countries even to the west.

- Lack of government resources for addressing key wildlife trade issues is concerned. Wildlife trade monitoring is non existent, due to low capacity, financial constrain, coordination, advocacy, training, intelligence gathering and informants' network.

- Many strategies for various environmental sector has been developed. Yet there is shortages of implementation within the government and partners. It is therefore imperative to provide support to these key activities which can address the demand side of the illegal wildlife trade.

- Lack of regulatory framework and institutional structure in the issue has left the area under ever growing pressure. Land encroachment, grazing of livestock, building of shelter, repatriation of refugees, resettlement, lack of political support, shortage of energy and shrub collection are the foundamental pressure on protected areas. This has caused further degradation in and around the bufferzones of protected areas.

- In early 2004, the government and donor community initiated programs to re-designate the areas, but short term program in shortages in implementation of middle term programs have not been much significant. Inspite of mentioned difficulties, there has been a number of actions that has reduced pressure of over utilization of natural resources which needs strong follow up in the long run.

Progress

The communities around protected areas and national parks are mostly vulnerable and poor. While meager, but provision of alternative livelihood has brought sufficient changes in the protection. It is believed that degradation of these areas may have leave adverse effect to the vicinities area and then to the next. Restoration of ecosystem and potential areas are essential when the communities are participating in design, implementation and decision makings.

1. Established National Protected Area System of Afghanistan including roadmaps
2. Captive breeding systems
3. Listing of protected and harvestable species of wildlife
4. Declared four sites in four geographical areas as national parks and protected areas
5. Created human capacity for natural heritage protection throughout the country.

Recommendation

- Implement policies and in-acting of relevant policies and legal instruments in accordance to the proposed protected areas regulation.
- Accelerate the process to finalize protected areas regulation
- Customs Act for wildlife and plant
- Conduct advocacy and lobbying activities during strategic events (wildlife week, environment day, biodiversity day, regular campaigns) at a high political level as a means of awareness to garner political well to address protected areas and other ecosystems degradation including wildlife trades

- Establish community based natural resource and wildlife management program at the provincial, district and village level
- Regular monitoring of protected areas and wildlife reserves
- Conduct awareness raising and capacity building programs for government agencies, the judiciary, communities, traders and consumers through education initiatives, media, workshops, campaigns and training.

14. Rangelands/Pastureland

The rangelands of which the majority of population depends directly or indirectly are of steppe characteristic and on the basis of species composition, growth form and aspect are divided into two distinct communities:

- **Artimisian steppe**: forms a transitional shrub belt between desert and decidous forest from west (Herat province) to southeast (Ghazni on the side of HinduKush).
- **grass steppes**: this community occupies the fertile loss plains bellow decidous forest (*Pestacia vera*) in the north of HinduKush mountain ranges. As far as diversity is concerned, this can be distinguished into more grazing region in the country such as semi desert vegetation, *chinopodisceous* communities, amigdalus shrubland communities, ephemeral semi desert communities of loss belt, sub tropical shrub grass land communities, open decedous woodland and pistachio.

Land Use Type	1985	2006	2017	Share (%)
Forest Land	1,900	1,700	1.7	2,76
Cultivated Land	9,968	9,610	2.5 m ha	15.02
Grass Land	30,000	30,000	NA	46.02
Non-cultivated Land	55,255	55,613	1.1 mh lalmi	8.5
Other Land Uses	25,255	25,613		27.86
TOTAL				100

Sources: Agricultural master plan/2006

General Approaches for Conservation of Rangelands and livestock

14.1. Traditional Knowledge

Pastures cover approximately 40 million ha or nearly 83 % of Afghanistan's land area. Before the war, control over the rangelands were managed by the government. This control prevailed to users and was forms of understanding in wise utilization and grazing land. Though, the total feeding capacity of pastures has not yet been determined but a proportion of seasonal areas and livestock were considered efficiently. Nomads are core users of rangelands particularly in central Afghanistan. This segment have had kept its traditional knowledge until the war (1980s).

Nomads are indicators of rangelands, and the geographical layout of the country. They move long distances to exploit the spring and summer grazing land in Hindu Kush ranges and return each winter to the eastern and southeastern lowlands of Afghanistan and the border region. They have the knowledge to keep livestock away when the pasture is soaked. The traditional rotational grazing system had ensured sustainable use of rangelands. But it has abandoned due to the growing trend amongst transhumant populations to settle, and the consequent distribution of communal lands to individual families.

There is a need to revive this very effective indigenous grazing system along with modern range management approaches. Marketing of livestock produce is another important issue. Skins and wool from small ruminants can provide raw material for the leather and wool-garment industry. Traditional woolen blankets and rugs can be a major sources of income for families dependent on livestock.

Three basic rangeland systems for livestock in Afghanistan

14.2. Sedentary system

A system practiced by farmers whose main activity is the production of field and fruits crops, and who also raise some cattle, sheep, and goats, as well as poultry. Many villages also have access to nearby designated areas of common grazing or rangeland. Large and small ruminants are maintained by a balance between grazing, fodder and crop residues, and supplemented by little grain.

14.3. Settled transhumance system

A system is practiced by farmers whose primary activity is raising livestock, but who also cultivate grain and fodder crops. Traditionally, these communities move their livestock between different seasonal settlements - winter and summer - together with some other communities.

14.4. Nomadic pastoral system

A system that is practiced by mobile pastoralist or Kuchies whose main livelihood and lifestyle is based on tented life, raising livestock for the production of meat, dairy products and wool. They move with their flocks and herds as the seasons and grazing dictate, along well-defined lines of migration. Kuchies do not cultivate crops but usually depend on purchase fodder and grain from settled farming communities near whom the camp in winter. Cattle, sheep and goats are the main livestock while camels, horses and donkeys are also important. In particular environments buffaloes and yaks are raised as well. Over the past 30 years, livestock population in Afghanistan have fluctuated from about 4 million cattle and over 30 million sheep and goats down to the current lowest levels recorded in the recent history of the country of 3.7 million cattle and approximately 16 million sheep and goats, due to effects of insecurity and drought.

Major livestock products include meat, fibre (wool, hair and cashmere), hides and skins. Total meat production of Afghanistan in 2016 has been estimated at 291660 ton, while in 1967 the total meat production was around 184232 tons. It shows 1.16% increase. The 2015 estimates based on predictions of animal population, production estimates and growth indicators, comes with a figure of 1,450,900 tons of milk total (cows, ewes and goats). Therefore, 16,000 tons of fibre; and about 3.9 million hides and skins.[12]

In line with environmental concerns, while livestock is key assets of livelihood and economic development, the waste and pollution left behind can be considerable. For local communities livestock represents “a bank on the hoof” (living wealth of the mountain herders). For households with access to cropland, livestock provides not only the main source of income, but also a source of protein and fibre. The nomadic kuchi population, of which 1.5 million are estimated to be still active pastoralist, is mostly dependent on livestock for their livelihood.

2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	تاریخ
	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	12.0	12.0	حجم
	0.08	0.18	0.06	0.01	0.03	0.00	0.01	0.00	0.00	0.14	0.14		تغیرات %

14.5. Rangeland resources

The total land area of Afghanistan is 64.5 million hectares (ha), wherein the arable land is about 7.9 million ha, out of which only 50% is cultivated. The pasturelands make up 45.2% and forest cover is about 1.7. %. According to the newly drafted policy on forestry and rangeland management, a rangeland is defined as any land where the predominant vegetation consists - or consisted in the past years - of grasses, forbs, shrubs, and may include areas containing low growing trees, such as juniper, pistachio, oak, halaxylon and tamarix. Whereas rangeland resource refers to biological resources within a specific rangeland, including vegetation, wildlife, forests and their products, as well as associated ecosystems.

Afghanistan’s vegetation is characterised by the amount of precipitation and altitude. Vegetation is mostly that of tropical to semi deserts and steppe. Ephemerid vegetation grows in the sandy semi-deserts, while halophilous vegetation is found in the salt semi-deserts of the western region. In the northern area, near Amu-Darya, alpine meadows extend above 3500 m and these are utilised for summer grazing. The slopes of the Tirband-e-Turkistan (northern part of the country) are covered by pistachio and used for animal grazing. The most important grazing lands are found in northern Afghanistan, alongside the large deserts between the Khulm, Kunduz and Shiwa rangelands in the Badakhshan province.

The rangelands of Afghanistan are utilised by nomadic, semi-nomadic and rural population under the management of regulation plan, which was issued before the Afghanistan conflict began. The Afghan war has had a devastating effect on its people and on the country’s infrastructure, institutional strengths, natural resource management, food production systems and socio-economic structure. The poor management system during

[12] FAO /2014

last decade has resulted in an inequitable use of natural resources, which happen to have been confiscated by powerful individuals. Pastoralists are the main users of natural resources in Afghanistan. Sheep and goats have emerged as key animal species of the local flocks of pastoralists. This emergence is due to their better adaptation to harsh topographic barriers, rocky, climatic shocks (hot, cold, winds), and successful foraging behaviour in arid ecosystems.

The average land ownership in irrigated lands is 0.29 ha in Wardak province and 3.29 ha in Kunduz province and up to 7 ha of rain fed lands per family on provincial base. However, during wartime some land owners as well as a number of powerful people used to go up to 50 ha of rangeland for rain fed agriculture. In fact, some good quality rangelands were transformed into agriculture lands, yet, due to slops, they are prone to soil erosion and soil degradation.

15. Importance of rangelands

15.1 Sources of water for the region

Afghanistan's high-altitude rangelands are mostly found within the Central Highlands, which is the meeting place for all five of the country's major river basins, namely the Amu Darya, Northern, Harirud-Murghab, Helmand, and Kabul-Eastern basins. About 80% of Afghanistan's water resources originate in the Hindu Kush Mountains at altitudes above 2,000 masl. Amu Darya is the largest river in Central Asia region that originates in the highlands of Afghanistan and flow all the way through Afghanistan, Tajikistan, Turkmenistan, Uzbekistan, and Kazakhstan to the Aral Sea. The Kabul river is a major tributary of the Indus. A big natural challenge facing Afghanistan is its uneven distribution of water resources in both temporal and spatial terms. The climate is desert, and Mediterranean types, with a very long dry season from May to October and a cold rainy season from November to April. The rainy season of Afghanistan falls in the winter season and does not coincide with the agriculturally active season. Agriculture is totally dependent on irrigation. The capacity of the highland rangelands

15.2. Source of habitat for biodiversity

The highland rangelands are the major habitats for Afghanistan's rich biodiversity. Afghanistan is one of the most significant centers of origin of domestic plants and animals, as evidenced by the numerous local landraces of wheat, other crops, nine local breeds of sheep, eight of cattle, and seven of goats. The principal plant species whose wild ancestors are still found in Afghanistan are the pistachio (Pistacia vera, P. khinjuk), pear (Pyrus spp.), apple (Malus spp.), plum (Prunus spp.), almond (Prunus dulcis), and cereals (e.g., Triticum) (Saidajan 2012). Afghanistan has some 3,500 to 4,000 indigenous species of vascular plants of which 20% to 30% are endemic (about 700-1,200 species). In a rapid survey, Bedunah and his team (Wildlife Conservation Society 2010) recorded more than 600 plant species in the alpine rangelands of the Wakhan Corridor. Many of the larger mammals in Afghanistan are categorized by the International Union for Conservation of Nature (IUCN) as globally threatened. These include the snow leopard (Uncia uncia), wild goat (Capra aegagrus), markhor goat (Capra falconeri), Marco Polo sheep (Ovis ammon polii), urial (Ovis orientalis), and Asiatic black bear (Ursus thibetanus). Other significant mammals include ibex (Capra ibex), wolf (Canis lupus), red fox (Vulpes vulpes), golden

jackal (Canis aureus), caracal (Caracal caracal), manul or Pallas's cat (Otocolobus manul), striped hyena (Hyaena hyaena), rhesus macaque (Macaca mulatta), and brown bear (Ursus arctos). The highland rangelands provide the habitat for all of these species.

15.3. Sources of landscapes and recreation

The value of rangelands to the national economy for producing not only animal products, but as watersheds, wildlife habitat (biodiversity), carbon sequestration, and open space and aesthetic values. Community based management must be stressed in the management of State or public rangelands. Classification of values (productivity, variability, products including forage, biodiversity, etc), a determination of the state of health of the rangelands (including desertification, degradation, watershed condition, etc.), and land suitability.

Gaps

1. Conversion of rangelands into farmland

Conversion of rangelands into rainfed farmland either for fodder or other production purposes is common across the whole of Afghanistan. This practice has caused a visible decrease in available rangeland area and disturbance to routes of animal migration and is bringing about serious erosion problems. Since rangelands are common resources in Afghanistan, and cultivated land is often privately owned, converting rangelands into farmland is actually converting commons into private land. This land seizure is often done by influential and wealthy families at the cost of the poor.

2. Overexploitation

Due to the arid to semi-arid nature of Afghanistan, most of the rangelands have very low and highly variable fodder productivity ranging between 0.4 and 0.8 tonnes/hectare in years with good rainfall. Many studies suggest that in most of Afghanistan, the productivity of the rangelands is so low that an average ewe would need at least 1 ha of all-rangelands and 16.4 ha of one-season rangeland. The number of livestock has fluctuated over the years, but even at its lowest, the number of animals is still very high compared to the total fodder production from the natural rangelands. In 2003, Afghanistan had roughly 44.2 million sheep equivalent livestock units, well-exceeding the carrying capacity of the rangelands. As a result, most of the rangelands are overused. Fuel shortage is a critical issue in rural areas of the country. The increasing demand for energy arising from the growing population has created increasing pressure on traditional rural energy sources, particularly on fuelwood and rangeland shrubs. Because of the long winters and cold climate, people need large amounts of fuelwood for survival. The tremendous demand on fuelwood has created serious pressure on the rangelands.

3. Governance

As a result of many years of conflict in Afghanistan all sectors of governance face many challenges. Since the new government has only been in place for a few years, policies, laws and regulations have not yet been endorsed. The new policy on rangeland

management has just been drafted and it should take a long time for it to be approved and implemented. In order to be implemented effectively, national policies should be transformed into laws and regulations.

4. management issues

Despite the important role rangelands play in sustaining the livelihoods and the overall economy of Afghanistan, numerous problems exist in relation to the use and management of their resources. These problems are quite complicated and complex; most are interlinked. The majority of the difficulties relate to the broader political context, which – for the past two decades - the country has been engaged in continuously. A few examples of rangeland management issues are as follows

5. Users and public awareness

Like many countries, rangeland resources - especially those in the remote and marginal areas - are often regarded as barren or waste lands. Therefore, they are not listed on the agenda of management and legislation. The public failed to recognise the multiple roles of rangeland resources in socio-economic development and environmental conservation.

6. Conflict over tenure

Rangelands resources in many cases are used as common resource, conflicts among multiple users become natural and inevitable. In the case of Afghanistan, conflicts are more complicated and complex. There is no distinction between government owned lands and communities owned lands under the care of the government. This makes it easy for the powerfuls to take hold of the common land. In some situations, the conflict is between kuchis and sedentary farmers. The lack of any coherent legislation on land rights generates conflict, in particular, between kuchis and sedentary farmers over land rights.

7. Pasture degradation and desertification

Pasture degradation is widespread in Afghanistan. It reflects a decrease in vegetation cover, the increase of thorny and non-palatable species, reduction in forage productivity and desertification of rangelands. The causes for land degradation, for example, could be overgrazing, the uprooting of shrubs and weeds for fuel woods, deforestation and prolonged droughts.

8. Shortage of winter fodder

The country’s rangeland area is estimated to be 45.2 % of land area; out of which, the total area available for winter grazing is only 40%. In the winter, the primary feed resources for domestic animals is wheat straw mixed with cultivated dried legumes, mainly alfalfa and clover hay. Due to less intake of protein, the animals become very weak. Other feed and crop by-products are also fed to the livestock (cotton seed cake, maize and barley grain), but these feeds are generally in short supply, and are most often kept for poultry and lactating cows.

9. Lack of baseline information for rangeland management

Baseline information on rangeland resources and rangeland management is either rare or out dated, especially information on the floristic composition and vegetation types of rangelands and their distributions, the annual production of dry matter, nutrition analysis, annual variation of biomass production, etc.

Effects

1. Climate change

Afghanistan is extremely vulnerable to climate change. The temperature in the country has increased by an average of 0.13ºC per decade since the 1960s, higher than the world average, and precipitation has decreased by 2% per decade. The number of incidences of rain has decreased by 4-8 times per month during the rainy season. Over the last 10 years, summers in the alpine regions have become longer and winters shorter. Fruit trees now begin flowering 10-12 days earlier on average than in the past, and the fruit ripening time has advanced accordingly. Visible changes have also been seen in the flora and fauna of the high pastures. It is projected that Afghanistan will experience an average temperature increase of 2.0 to 6.2ºC by the 2090s (also significantly higher than the global average), and that warming will be most rapid in spring and summer. It is also predicted that in general, Afghanistan will become even drier in the 2090s mainly due to a decrease in spring rainfall. Climate changes, especially rising temperatures and more erratic precipitation, have been felt by the pastoralists and are affecting their livelihood strategies. The increasing frequency of droughts and floods has caused great losses of life and property. Local communities have adapted to these changes, either passively or proactively, by changing the temporal and spatial pattern of seasonal migration, introducing drought-resistant crops or animal varieties, and turning to alternative income-generating activities. However, the adaptive capacity of the pastoral communities to deal with change is severely limited by multiple factors including insufficient information, low economic capacity, lack of modern technologies for farming and livestock management, lack of a risk management system, heavy dependence on rainfed cultivation, and direct use of natural resources. In general, there is a lack of data on almost every aspect of rangeland management in the area, including climate, soil, vegetation, rangeland resource volume and distribution, and socioeconomics.

Afghanistan's varied topography has created a number of diverse habitat types, with temperature and precipitation changing considerably at different elevations. The species that occupy these habitats are uniquely adapted to their ecosystems and, therefore, vulnerable to the impacts of climate change. Afghanistan is home to more than 700 species of animals and 3,500-4,000 native vascular plant species. Human activity, especially habitat fragmentation, is the primary cause of biodiversity loss, though climate change is expected to become the single largest global cause of biodiversity loss before the end of the century.

Afghanistan has important forest and rangeland resources that help support much of the country's rural livelihoods. These forests and wooded areas are particularly valuable in dryland areas because they provide fuel wood and timber, as well as other forest products such as nuts and medicinal plants. Nevertheless, the trees and plants that make up

Afghanistan's forests and rangelands face a number of climate change risks and adaptation challenges as temperatures increase and availability of water resources decreases. Afghanistan's forests are already severely damaged as a result of decades of deforestation, overharvesting, mismanagement, and drought, and today account for only approximately 1.5-2 percent of the country's total land cover.

Afghanistan's annual renewable surface water resources are estimated at 57 billion m^3 distributed across five river basins. Afghanistan has an estimated overall surface water availability of 2,775 m^3 per capita per year, which is considerably higher than other countries in the region. Nevertheless, these water resources are not evenly distributed across the country or equally accessible at all times of the year. The availability of water in Afghanistan is also characterized by considerable intra- and inter-annual variations, and has the lowest per capita water storage capacity in the region. This reduces the opportunity to harness surface resources and renders the country more vulnerable to drought and other water-related climate shocks.

Agriculture is the foundation of Afghanistan's economy and livelihoods, supporting some 80 percent of the country's population, either directly or indirectly. Of the country's total agricultural lands, it is estimated that only approximately 2.5 million hectares is irrigated and regularly cropped, while another 1.1 million hectares is rain-fed and cropped opportunistically, depending on precipitation.

Livestock products contribute more than 50 percent of agricultural GDP. Over the past 30 years, livestock populations in Afghanistan have fluctuated between periods of prosperity and drought from highs of more than 5 million cattle and over 30 million sheep and goats to lows of only 3.7 million cattle and 16 million sheep and goats. Increasing pressure on available land over the last two to three generations has led to expansion of rain-fed wheat cropping into traditional grazing lands and high mountains.

Following nearly four decades of conflict, much of Afghanistan's infrastructure and energy facilities have been destroyed or severely damaged. Currently, domestic energy production is at nearly the same level as it was just prior to the invasion of the Soviet Union in 1978, while the condition of these energy facilities is greatly degraded. Only 28 percent of Afghan households are connected to power supply systems. Afghanistan also relies heavily on electricity imports from neighbouring countries, which account for more than three quarters of total electricity usage. Afghanistan's abundant water resources does mean that there is considerable potential for hydropower development (estimated at 23,310 MW), which currently accounts for nearly half of domestic electricity installed capacity, with the remainder made up by thermoelectric and diesel generators. Domestic oil production in Afghanistan is insignificant, and the country relies on imports of petroleum products to meet domestic consumption needs. In addition to hydropower resources, Afghanistan also has excellent wind and solar potential estimated at 66,726 MW and 222,852 MW respectively, which provide great hope for long-term energy sustainability, especially in rural areas.

Similarly, rehabilitating the country's core transportation infrastructure has been a major national priority in order to increase connectivity across the country and between rural and urban areas. With the improvement of transportation infrastructure, the number of vehicles

being imported and on the road has increased significantly to nearly 2 million. Moreover, over the years, air traffic has grown considerably and as of 2015/16 includes 6 government owned and 12 private airplanes.

During the earlier 2000s, Afghanistan experienced high economic growth rates, but this was accompanied by high volatility due to the prominence of the agriculture sector. More recently, Afghanistan's growth has slowed and foreign aid inflows have declined, while the deteriorating security environment and political uncertainty undermine private sector confidence and economic activities. According to the Asian Development Bank, economic growth in 2018 is projected at 3 percent, which is slightly lower than growth of 3.6 percent in 2016-17, but up from -1.8 in 2015-16 and 3.1 in 2014-15.

2. Revitalizing the rangelands

Due to the non-equilibrium nature of the rangeland ecosystem in Afghanistan, it is important that local communities be given the right to own the resources and make decisions on their management so as to cope with uncertainties and increase their incentives for management input and sustainable use," they say.

Emphasizing the need to develop locally appropriate models for rangeland rehabilitation, the report suggests that such models should take into account both the short-term and long-term interests of the farmers while reconciling ecological and economic efficiencies, "for example, through the integrated use of fodder plants, short-lived cash crops, and fodder-fuel-wood (shrub) and fruit tree models."

Ways forward (Rehabilitation of rangelands)

The following methods can be used to address the rangeland management issues and rehabilitate the degraded rangeland:

1. Promote rotational grazing to give rest period for rangeland: Villagers will be encouraged to design rotational grazing patterns (after resource inventories and mapping), which could give rest periods for rangeland resources, so to restore their productivity.

2. Cultivation of multi purpose trees, shrubs and grasses: To increase options for communities, new technologies and patterns of intercropping could be introduced. Community owned or managed forests and/or shrub plots with locally suitable drought tolerant species have multiple functions for nitrogen fixing, water and soil conservation, fodder uses besides providing fuel woods and timber for villagers.

3. Enhance fodder supply to address forage shortage: An increase of fodder supplies from fodder planting in arable lands will help to reduce the dependency of herder communities on the rangelands in winter, and, thus, contribute to the restoration of rangelands.

4. Hay and silage making techniques to increase fodder nutrition: Hay and silage making techniques will help to increase the productivity of livestock production. Since

options for direct technical interventions on rangeland are quite limited, enhancing fodder supplies from farming lands to reduce pressures on the rangelands becomes particularly important.

5. Enhance public awareness and build capacities of related departments and stakeholders on the management of rangeland resources: Public awareness can be raised through various means such as: mass education, religious leaders, community elders, TV, radio, brochures, flyers, pamphlets, etc.

6. Water, soil and biomass conservation technique: Conservation ponds; eyebrow pitting; roof water harvesting, etc.

7. Promote alternative sources of energy: More than 80% percent of Afghanistan's population live in rural areas and have no access to modern forms of energy (e.g. electricity, gas, and liquids fuels). Most depend on traditional energy sources such as fuel woods, agricultural crops residues, animal waste and kerosene for cooking, heating and lighting. Therefore, solar, wind and other forms of energy can be introduced.

8. Participatory/co-management (an approach for enhanced livelihoods and conservation): Research and pilot cases from all over the world prove that co-management of natural resources is the most promising approach to manage rangeland resources to sustain pastoral livelihoods. The essences of co-management is based on the fact that key government bodies and local communities - including other concern parties - can negotiate, plan and carry out strategies to manage rangeland resources through equitable processes of hands on learning. Rangelands are the most disputed types of lands in Afghanistan, requiring all key stakeholders to come to the table for negotiation and practical betterment.

9. Document indigenous knowledge and practice adaptations to climate variability (especially recurrent drought): Such documentation may help people to understand local people's perceptions of climate variability and identify locally acceptable coping strategies.

10. Assess the rangeland; identify options for rangeland management and rehabilitation: Rangelands in Afghanistan represent a type of ecosystem whose productivity and status varies greatly in terms of annual rainfall, which is highly variable between years and seasons. Studies needed to assess the rangeland conditions and also identify technically, socio-economically and ecologically feasible options for rangeland management and rehabilitation.

11. Introduce new fodder varieties from Iran, China (Xinjiang, Gansu, inner Mongolia, Pakistan, India etc). Drought tolerant and hardy species can be introduced from the same ecological zones after trial.

16. Forest Resources

Afghanistan's timber has been greatly depleted, and since the mid-1980s, only about 3% of the land area has been forested, mainly in the east. Significant stands of trees have been destroyed by the ravages of the war. Exploitation has been hampered by lack of power and access roads. Moreover, the distribution of the forest is uneven, and most of the remaining woodland is only found in the Kunar, Nuristan and the Paktia regions in the east of the country.

The natural forests in Afghanistan are mainly of two types: dense forests of oak trees, walnut trees, and many other species of nuts that grow in the southeast, and on the northern and northeastern slopes of the Sulaiman ranges; and sparsely distributed short trees and shrubs on all other slopes of the Hindu Kush. The dense forests of the southeast cover only 3% in 1960s and 1.7% in 2015 of the country. Roundwood production in 2015 was 3,148,000 cubic meter, with 44% used for fuel. The destruction of the forests to create agricultural land, logging, forest fires, plant diseases, and insect pests are all causes of the reduction in forest coverage. Illegal logging and clear-cutting by timber smugglers have exacerbated this destructive process. There is currently a ban on cutting new timber in Afghanistan. Prior to 2001 and under Taliban rule, massive deforestation of the country side was permitted and Afghans moved large quantities of logs into storage centers for profit, where the trees wait for processing on an individual tree by tree request.

16.1. State of Natural Forest

The forests in Afghanistan are amongst the important natural resource. However, during the decades of conflicts, and afterward, no considerable achievements for rehabilitation and extension of forest areas have occurred. it has decreased considerably due to uncontrolled use of forests, war and being in the bordering provinces. Their products also been naught. Compared to 3% of the total forest covers in Afghanistan in 1960s, the current forest area reduced to approximately 1.3 million hectare (2.1%) of the country's total area in 1978. Between 1980 to 2017t, the rate of deforestation in the country has been estimated 1.7%. Forest depletion has emerged as one of the most serious environmental issues sofar. Forest depletion has brought about many other environmental impacts such as landslides, soil erosion, floods, soil degradation, out-migration of people, and so on. Thus, conservation of the forest resource is fundamental to the protection of other resources such as water, soil, flora and fauna, and human activities such as agriculture, animal husbandry, and logging which are directly and indirectly dependent on it.

16.2. State of Urban forestry

The term "urban forestry" has around 2-3 decades history in Afghanistan. In the past decades, a number of attempts have been made to deal with the growing urban forest problems and this opened doors to effective stakeholders involvement in the greenery. Community forestry projects have begun to reinstate community means for management and regulation of urban forest, where the government ability to do so, was weak, even on natural forest. This has been more effective. Farmers in pre-urban areas were encouraged to have been planting trees.

The initiative begun as a practical mechanism of which most of statement took place to adopt and follow a settled course of action. This mechanism than slowed down with the political turmoil. There was little peri-urban development mechanisms, because of lack literature and the plans developed at the time. Understanding the extent of urban and peri-urban forests mainly depends upon the sources the Department of Forestry and Range of the Ministry of Agriculture, the Greenery Department of Kabul municipality and the districts authorities have in hand. While many acres of land and hilly sides has been covered by trees in the time of which remnant give an evidence.

Kabul and other cities suffer far more sever urban forest scarcities than most of the cities in South Asia. Its natural forest assets is very small and or naught of its kind. Covering less than 1% of the total land area and most tree varieties are slow growing because of variability in climatic aspects. Urbanization, population growth, and encroachment is one of the issues that backing the efforts. The demands for fuelwood, construction wood and wooden industries has given more pressure on it. One of the issues that has left more and more negative impact on deforestation is lack of awareness, and alternative energy sources. The government (Ministry of Agriculture and Municipality) made efforts to include urban forestry in the time master plan. This plan imposed a number of greenery programs in and around major cities. Central parks including Zarnegar (1963-1964) was established. In addition to that some other parks were around Chamcha mast river, Temorshah park, provided accessible recreation site for the civilians. The next component of greenery system in Kabul city was developing tree plantations around main roads and boulevards.

The efforts of the government and related institutions with regards to urban greenery while can not be accountable but has been an initiatives in many cities including Kabul, Nangarhar, Kandahar, Hirat, Balkh, Baghlan and Parwan. Therefore, the ancient culture of tree plantation in and around residences are sustained, but very poor. The hills around the city of Kabul became depleted of trees and bushes completely. Same scenario has left major pressure on deforestation in other cities as well. The active land mafia has also contributed to urban deforestation a great deal. An example of the urban deforestation can be seen in Bagh-e-Bala of Kabul of which hundreds of old trees were uprooted. Even individuals cut the trees around and inside their buildings for fuel and construction.

There has been a gap of studies for the imported saplings in early 2004. The government with the support of donor community provided thousands of saplings of different species from outside. There were several reasons for failure. Lack of understanding of the climatic situation, transportation and transplantation techniques and seasonal issues. Under this program totally, 99% of the saplings died soon after plantation on the ground.

16.3. Factors of Forest depletion

Diminishing forest area can be attributed primarily to the rapid growth of population. The number of people dependent on agriculture is rising; and as a result agricultural land has increased, mostly by encroaching upon forest areas. One of the major challenges faced by the country is how to conserve forest resources. Some programs, such as community forestry programs, is the most possible tools to increase forest cover. A primary steps for this purpose had been undertaken by the ministry of agriculture in 2014 to revise and approves forest law which can be fundamental tools for protection. But, on the other hand,

there are also activities responsible for the dwindling of forest resources in the country. It is important in this context to understand the status of forest resources in terms of use and misuse, measures undertaken to conserve the forests, and programs laid down for the future by the national government. However, the forest strategy developed by the department of forest and range is a tool for conserving forest, but is mostly depend on the data available or characterized by being both scanty and scattered.

Vegetation cover in the country depends on the geographical and ecological factors such as soil component, elevation, moisture, temperature, and wind-fleet etc. It makes an extensive spectrum of non-perennial plants and perennial plants. According to the international sources, there is valuable confirmation to suggest that the natural vegetation of large parts of Afghanistan was originally woodland forest. Before the war major parts of the area were covered by forest of which the irresponsible cutting resulted a great lost. Centuries of destruction have resulted in the almost complete disappearance of forests from plains and valleys of the country.

Scattered remnants of juniper stand on the northern slopes of HinduKush gives evidence of the previously large forest on the non-barren slopes. The formerly extensive tamarix forests of southwestern Afghanistan have been heavily over exploited and now exist as scattered bush stands. As far as diversity is concerned on the basis of dominant species and ecological distribution can distinguish 10 types of forests in Afghanistan. This classification is based on literature revised:

- low population density due to unfavorable topography in higher elevations protection of economically valuable trees such as pistachio *Pistacia vera* and *Pinus gerardiana* protection of trees around grave yards, tombs and shrines such as almond forests, mulberry and others because of religious beliefs.

- Most of natural forests of Afghanistan are physiographically climax because of inadequate rainfall. Soil conditions become more mesophytic at higher elevations and allow the development of the unique altitudinal zonation in forest types. Over 80% of our national energy budget production and mud bricks industry contributed to the disappearance of juniper and Oak Forest.

16.4. Fuelwood consumption

The consumption of fuelwood has continuously increasing since long. The domestic sector consumed more fuelwood than the industrial, commercial and service sectors. It is estimated that the annual consumption of fuelwood in Afghanistan is around 4,320,000 MT. This has left larger pressure on the fragile forest resources in Afghanistan. Agricultural residues, animal waste, shrubs and other traditional fuel is excluded. The Government of Afghanistan needs to promote alternative energy resources for domestic use at affordable prices if the forest resource is to be conserved. Endangered animal species depending on the forest. These species includes the amphibian, birds, vertebrates, Mammals, fishes and reptiles.

16.5. Infrastructural development

The forest has also been used for infrastructural development such as roads, schools, public places, institutional buildings, and so on. Large areas of forest has converted to and have been used for infrastructural development (urban and rural) in the country respectively. As per rapid assessment of timber in Afghanistan, out of the imported timber from Russia and central Asian countries, the annual average consumption of timber for infrastructural development can be estimated around 428,400 M3 timber.

16.6. Logging of timber

Despite Afghanistan's fierce winter, it's rare to find a house with insulation or a modern heating system. The High Commission for Air Quality Management approved the strategic plan for 5 years to substitute use of solid fuel of all government buildings and businesses including fuelwood to electricity and liquefied gases in major urban areas especially in winter. This system has reduced some amounts of deforestation, but needs to enforce in medium and long terms. At the moment, almost all Afghans especially in rural areas rely on *bukharies (* stoves) that look like an oil drum with a big rusty pipe growing out of the top that bends off into a hole in the wall. There is a huge demand for Afghan timber in the international market as well.

One reason for keeping the tropical forest provinces Kunar, Nuristan and Nangarhar insecure, is illegal cut and logging of forest in the country. Commercial timber harvesting is illegal in Afghanistan, which leaves a massive smuggling industry to fulfil international demands. The remaining forest is in places like Kunar province being adjacent to Pakistan, which is the main outlet for Afghan timber now. There's a big timber business running during the night times.

17. Key tools to Protect Forest

17.1. Revive/improve Indigenous and Religious Knowledge

For thousands of years, the people of Afghanistan have based their survival needs on forest and the flora and fauna they spawned. Local people presuppose to plant tree and promote forest plantation around. This knowledge is being adopted anciently. They have many perception of trees and forest; (i) economic values; (ii) construction purposes; (iii) fuel and energy sources; (iv) shading and fencing purpose; (v) fodder and feeding; (vi) greenery and (vii) medicines. Also people assumes that a single tree harvest for 100 years and as the only sustainable resource and economic item.

Though, farms and community forestry has not been widely practiced in the country, but people have kept its minority plantation habits. There are a traditional knowledge of tree protection and plantation. Cutting the trees around shrines, mosques and sacred places are completely prohibited. Utilization of such trees are allowed for the holy places, social and religious oriental works, as fuel for warming mosques etc. This utilization is selective. Only those trees are cut that are old or is in danger of desiccation. Even the fallen leaves and branches are not supposed to be used by individuals. The leaves are stored and transport to holy places for use. Sometimes, they cut the trees to make bridges over the rivers, which more than 10 families use, the bridges.

17.2. Improve Traditional Knowledge of Watershed Management

This is also one of the national level traditional knowledge which helps in the conservation of forest as well as keeping the source of water clean. People have the belief that they should not cut trees or woods that surrounds the source of water. They should not throw litter around the watershed. If they do not obey, bad things may occur to them. This tradition or belief preserves the forest as well as it preserves and keeps the source of water clean. This is still practiced nowadays in the remote villages of the country. Those areas which has occupied by government and or converted to industrial sites, the tradition is slowly disappearing as people do not have access to these forests and water shades. In the meantime, efforts for designation of national parks or reserve areas might follow the same patterns of disappearing this knowledge. It is suggested to integrate new and traditional knowledge when promoting the areas as specific ecosystem.

18. Gaps and Challenges

The forest, according to the Department of Forest and Range, refers to all land having trees with more than 10% crown cover and not used primarily for purposes other than forestry. This also includes temporarily cut forest area. Forest depletion refers to the diminishing of forests in terms of quantity and quality. Quantity refers to the gross area covered by the forest whereas quality signifies the density of trees in the forest area. The long lasting war in the country has also imposed many deforestation problems of which the natural forest in south, eastern and northeastern regions being more affected. One of the very depressing issues were uprooting of almond and pistachio forest in the north and western Afghanistan in while during 1998.

1. The total forest area that has been encroached upon by different sectors.
2. Considerable numbers of trees are outside the public forest. Villagers use many of them for fodder, fuelwood, and timber. Their existence, therefore diminishes pressure on the forest. However, there is a data gap on the area covered by such trees.
3. There is no detailed information on endangered plant species. Surveys should be conducted to collect information on such plant species. Policies that have not been developed
4. Buffer Zone Regulation
5. The Plant Protection Act (under the master plan of the ministry of Agriculture)
6. National Conservation Strategy Development
7. The Soil Conservation and Watershed Law has not been developed yet
8. National Conservation Strategy (should be developed)
9. The next striking feature of forest resource developments is leasehold forest management through user groups. In this regards, state-managed forest should be hand over to user groups for leasehold forestry and this should be extended in the future
10. Afghanistan inclusion and ratification of Multilateral Environmental Conventions and treaties related to the conservation of forests and biodiversity helps in taking possible action toward the conservation of already degraded forest.

19. Key Pressures

19.1. Population Growth

The population is growing at a rapid rate; the growth rate has remained at over 2.4% per annual since 1978. Population growth appears to be the single most important factor behind diminishing forest resources in the country.

19.2. Traditional energy use

There has been a number of different energy development projects and energy use in rural and urban Afghanistan in the past 15 years (2002-2017), but the strategic gap of energy consumption among population has left unchanged. Yet, the population is excessively dependent on fuelwood in many parts. Since long, fuelwood derived from the forest, constituted the largest proportion of the total fuel consumption (72%). With the increase in population, the consumption of fuelwood, has also increased. The fact is that, in the absence of alternative energy sources, most rural people have to depend on forest fuelwood for cooking, baking and heating. It should be noted that the rural communities constitute about 88% of the total population. The forest area is easily reachable by local people continues to be depleted ruthlessly, and is mostly located on agricultural lands and slops. The pattern of energy consumption has also changed. Between 1970 to present, total energy consumption increased; the percentage share of fuelwood declined during 1978 to 1991). Between the same years, the use of traditional energy sources like cow dung and agricultural residues, excluding fuelwood, declined moderately, while the consumption of commercial energy, such as coal, petroleum products and electricity, increased.

19.3. Livestock and grazing area

Much forest area is used as grazing land for livestock, the numbers of which are also increasing tremendously. This has led to further degradation of the forest area. The number of livestock (cattle, goats, and sheep) increasing annually, while the grazing area remained constant. The pressure on the forest varies with geographical region. In the former, the higher rate of deforestation might have been due to the greater dependency on fodder supply for livestock. Other reasons for forest degradation include landslides, agricultural land expansion, fuelwood demand, and infrastructural development.

19.4. Human migration

Migration and population movements has been a continual process from 1979-2017) in Afghanistan. While in some cases, it is a major factor that the forest remain in-touched and forest areas encroachment remain minimum. But on the contrary, the military operations, disclosing visibilities, active timber Mafia in neighboring countries, vehemently fires on the natural forest and using the forest as stronghold of fight against government military forces, caused most of the forest in hills and slope areas vanished. During the almost four decades from the trend of encroachment and smuggling of hills forest increased and many local commanders and warlord permitted the migrants from the conflicted cities to settle in any areas where possible. These situation left a very negative impacts to all sorts

of the forests. In the meantime the areas around the cities where conflicts forced the citizens for frequent displacement also affected enormously from cutting to converting to residential areas. Encroachment of forest land has occurred in many provinces and districts as a result of the construction of refugee camps in and around the forests. It is stated that, in the beginning, the refugees were provided access to forest to use the forest wood for cooking fuel and hut construction. Later, the demand for fuelwood for cooking and for cash earnings by the refugees also placed high pressure on forest resources, aggravating the situation further. Even, the shrubs and juvenile trees did not remain in-touched.

19.5. Trans-boundary smuggling of logs

Another factor in degradation of the three natural forest areas in Afghanistan, all along the Pakistan-Afghanistan border is trans-boundary smuggling of logs into Pakistan. The activity intensified when the clashes in cities begun and warlords took the control of most areas. In eastern Afghanistan the chartered aircraft were transported more than 15 trucks of timber to Middle East daily where the price of the product is higher than in the bordering countries.

Despite the recent high price of Afghan timber in local market, the markets for timber has been large because of its quality than the imported timber. According to a study by a group of national conservationists in 2005 timber logging and transportation to the cities and to the bordering areas were allowed by the time government. More than hundred long trucks of approximately 35 tones each were loaded in forested areas (Kunar and Nangarhar) for transportation to border areas. The presidential decree to ban timber transportation from forested areas has been issued, but the decree has not been enforced sufficiently. Presently most of the timbers are smuggling illegally to neighboring countries. The provincial governments of Kunar, Nooristan and Paktia has taken measures, but the management is likely poor due to absences of forest rangers and guards. The smuggling happens in remote and inaccessible areas (SEA/2005).

19.6. Urbanization processes and the impacts on forest

Kabul and other major cities in Afghanistan has become the most populous cities. The environmental consequence of a rapid population increase is pervasive. The sub-division of agricultural land holdings, the migration of people from rural, the increase in demands for forest goods and services and the consequent denudation of forested hillsides have become common.

Since the country has been the scene of conflicts stemming from struggle for control over the cities, outbreaks of violence became increasingly common. Flow of people from rural areas to the city, enforced the political affairs to extend the cities and encroach many green and agricultural fields. Consequently, most of the urban forest and green areas do converted to residential areas that left further pressure on forest. Therefore, the constructions has also left huge impact on deforestation.

19.7. Lack of Practical Forest strategy Implementation

Within the period of peace and instability in the country, urban forestry and greenery entered to its new phase. Many international community committed to assist related departments in establishing forestry programs in Kabul city and surrounding district. Asian Development Bank (ADB), the USAID, Italian Cooperation, FAO, UNDP, WFP, MADERA and a number of national organizations assisted the forest department in developing strategies, physical reforestation programs, education and introduction of new technologies. But the gap of fully cooperation and assistance that commit for long term is still existing. It is hoped that these commitment for urban reforestation becomes more stronger in the future.

19.8. Forest Administration

Under the Priority Reform Reconstruction, the division of natural resources in Ministry of Agriculture, Irrigation and Livestock (MAIL is responsible to lead forest management in Afghanistan that consist sub divisions of forestry and rangelands management. The National Environmental Protection Agency has also signed a procedure with MAIL and seconded the protected areas and wildlife management for an undetermined period. As per environmental law, NEPA has also selected MAIL as Scientific Authority for CITES related programs. General directorate of forestry, is responsible for the management, utilization, protection and regeneration of the country's natural forests, manmade forests, rangelands, national parks and wildlife resources through its 11 directorates in its headquarters in Kabul and a forestry director in each of the 34 provinces of Afghanistan. However, the current organizational setup of Directorate of Forest does not reflect recent forest management trends and new technologies that can facilitate forest survey and planning. Directorate of Forest has approximately 196 staff of various background and 1,215 administrative and supporting staffs throughout the country. The staffs are not much motivated, but are working under difficult conditions, very limited budget, facilities and with little access to practical training in modern forestry and reforestation methodologies.

19.9. Forest policy

There has been a number of key issues that was not covered by the policy which may have contributed to further depletion of natural forest. It is argued that the 'forest protection Act 1988 (1367)' appears to have been un-favorable for the protection of dwindling forest resources. The act was implemented in the country on the assumption that it could consolidate the protection and management of the forests, but conversely it rather led to degradation of the national forests by providing uncontrolled local access to them. Mostly, the tribal leaders, surrender commanders and local government's militia were supposed to guard the forested areas. In the meantime, many other tribes who've been registered with the ministry of frontier of Afghanistan benefited much. This process completely neglected the traditional forest management practices[13]. MAIL successfully finalized and approved a revised Forestry Act 2014 that has covered to reduce most of the current issues and challenges, including protection and harvesting. Enforcement of law is an utmost required national prepositions.

[13] Malikyar/2015

20. Forest Impacts on Socioeconomic, environment and ecosystem

The forest in Afghanistan has many important functions: production of woods, woody goods, fruits, protection of natural environment, provision of habitat, and regulation of atmospheric conditions. Since many communities in natural forest ranges are directly dependent on the production function of the forest, it had negative impact on the way to enhance the economic benefit of the community, by logging and smuggling to neighboring countries. The neighbor's logger receive more benefits rather those who cuts, logs and transport to suitable site to be illegally exported. The protection and regulation functions which was for ecological betterment, neglected until now. The ongoing trend of deforestation is having a negative impact on both the production and the protection functions of forests. Impacts of deforestation are perceived on the following fronts.

One major impact of deforestation is on the forest structure of Afghanistan. The primary on desk inventory of forests shows that the growing stock of the forests has decreased in all three physiographic regions. Non and/or very little regeneration happens. The only fortunate way of forest protection was the traditional shareholders that was managed properly. Moreover, the forest around shrines, pilgrimages, and religious places and the upper areas because of fear of wild animals remained intact. The recent use of Mother Bomb by US coalition forces has left negative impacts on the surrounding areas.[14]

20.1. Impact on biodiversity

Another conspicuous impact of deforestation is on the flora and fauna. Various plant species are considered threatened as a result of deforestation and increasing pressure on their uses. Because of lack of data and the available literature, the data based on the assumption indicate that the endemic and non-endemic plant species have been vanished

The latter are found to be under immense threat. Afghanistan's threatened animal species, such as mammals and birds, constitute a high rate of the world's threatened species. Endangered animal species depending on the forest. These species includes the amphibian, birds, vertebrates, Mammals, fishes and reptiles.

20.2. Impact on ecosystem

The occurrence of landslides, soil erosion, and floods in some areas have been annual phenomenon in Afghanistan. Deforestation may be leading to an increase in some of these natural disasters. A thin overstorey canopy of trees with virtually no regeneration, severe erosion, and low organic matter content of soil, characterized most of the degraded forest. Over the sloping areas of the middle hills, the farmers have cleared forests for cultivation to meet their food requirements. This has resulted in environmental degradation in the form of accelerated soil erosion leading to and degradation,

Figure 1 urban forestry program

[14] US Army: Mother bomb in Nangarhar province/2017.

declining productivity, and sedimentation in downstream areas.

The occurrence of floods and landslides as a result of deforestation has affected not only the degradation of land but also human lives and property. The consequences of floods and landslides in the country have cast to thousands death. The degree to which lives and property are lost and land degraded has been found to vary in different years.

20.3. Impact on the atmosphere and Carbon emission reduction

The burning of forest fuelwood has changed the local atmosphere, particularly in rural areas of the country where fuelwood is the main source of heat energy. Due to burning fuelwood and deforestation, the concentration of carbon dioxide (CO2) in the atmosphere probably be a common tragedy, that is increasing due to population growth and decreasing the resources. The increase in CO2 in the atmosphere might added to the greenhouse effect and, as a result, the amount of radiant energy has also increased, thereby warming the local climate.

Taking into account the annual deforestation trend, large amount of carbon may emit into the atmosphere[15]. The burning of fuelwood has also emitted considerable amounts of other pollutants such as TSP, HC, NO2, and SO2 into the atmosphere elsewhere that has estimated by passive sampler devices, while the assumption of the same amount in Afghanistan would also come to reality.

20.4. Impact on forest access

In many areas especially in the south and northern Afghanistan, the forests are reachable to most of the rural and semi-urban areas. As a result of deforestation, distance traveled by rural people to reach the forests has increased considerably in the last 25 years. This is the main reason for deforestation. This means that rural people had to travel increasing distances to collect forest products, thereby reducing the time available for other productive activities. In the flat areas, the farmers grow various species of forest including willow, poplar, mulberry, and other fruit trees. The deforestation in these areas are in selective manner, but larger deforestation is evidence because of lack energy alternative and food insecurity.

20.5. Export of forest products

The environmental law of Afghanistan and the Convention on International Trade of Flora and Fauna (CITES) has imposed strict restrictions on all type of illegal exports and import forest and wildlife product, unless others legalized under the national and national rule and procedure. In Afghanistan, export of forest products is also not legal. Illegal logging and transportation, including timber and non-timber varieties, to Pakistan and Middle east has been increased since 1990's. Total illegal logging and transportation to Pakistan, have

[15] Malikyar/2006, 2011, and 2017 under the Kabul Air Quality Management Strategy

remained more or less stable. According to the statistics of Department of Forestry and Range in Afghanistan, in 1960's, a joint Afghan – German project on natural forest management in Paktia and Kunar has been an effective initiative in both management and utilization. This project has detained unimplemented due to harsh situation in the country. The products under this project had markets in and outside Afghanistan. Therefore, possible actions for the management and marketing of Jalghoza Nat were also the fundamental income to local communities. Compared to timber, non-timber exports remained more or less constant. In recent years, private sector investment in forest produced materials especially Jalghoza has increased the value of products and desirable imcrease in export of the nut has been foundamental.

Forest industry is key issues that has legalized as per the rules and laws of countries. It has regulated selectively. Selection of site, convert of broken branch into useful item, use of trees that will ultimately impact others, identify and cut of old trees that may affect others or faces natural fire, etc. are the most common use of forest for socioeconomic development, as per environmentally sound mechanisms.

21. Progress

Until 2002, the policies for forest development in Afghanistan had not been implemented practically. Following the identification of natural forest in 1950's in the strategic places, actions for protection and maintenance as security zones were promoted. Forest resources were used as one of the main sources of government revenue of which the communities had specific shares in it. But with the collapse of the time government and the incidences in political well, the government lost control over most of the forested areas. The weak policies in all sectors including agriculture and industries converted many forests into agricultural lands. After 2002, the government undertook a number of initiatives with regard to forest resource development. These activities assumed as an emergency one which should be persuaded by the following activities in the future.

- Setup an organizational structure for natural resource management that administering forest, rangelands, natural resources including biodiversity.
- Structural reforms of green forces responsible for protection natural and community forest throughout the country
- Community based forestry programs that involves user and protection groups
- Government policies for reforestation at the urban and rural areas

Some of the government programs on forest resource development are as follow.

1. Mobilization of community forestry program, initiated in 2004, emphasizes on sustainable management and development of forests through involving communities as forest user groups. The program has been very important with regard to forest development. The government should allocate and hand over areas of the state-owned forests to community forestry user groups for development, conservation, management, and sustainable use. Under this policy huge number of people directly benefit from being members of the user groups.
2. Another feature of forest conservation is management of forest areas as protected areas such as national parks, wildlife reserves, and conservation areas.

3. The government should adopt appropriate technology for alternative energy to help reduce dependency on traditional energy sources such as fuelwood. The Department of Renewable Energy under the Ministry of Energy and Water should prepare a Master Plan on alternative energy.

22. Challenges

Emerging to reforestation in Afghanistan require a number of plans, strategies, policies and regulations. These are including the followings:

22.1. Forestry sector legislation

The Master Plan for the Forestry Sector in a range of 10-15 years

- The National Forestry Plan
- Forestry Sector Policy
- Forest regulation (in ministry of justice for final approval)
- National Parks and Wildlife Conservation regulation (the final draft has been developed by the ADB/DNR/NEPA/UNEP 2006). The regulation is in the ministry of justice to be finalized.
- The EIA guidelines developed by NEPA/UNEP includes Forestry Sector (2005)

23. Recommendations

7. All natural forest in the country need to be declared as protected forests for conservation of the ecosystem.
8. Extensive plantation of trees should be undertaken wherever there are vacant public lands such as village wastelands, in and around farms, rural and urban parks, temple and school premises, and along roads and rivers. NGOs and private should be involved extensively in such activities. For this, the relevant government agencies should be enforced and reactivated.
9. Plant resources should be surveyed and catalogued so that the conservation of endangered and vulnerable plant species can be carried out.
10. The private sector should be encouraged to participate in the use and management of forests as far as possible.
11. The provision of a leasehold forestry program for groups of people living below the poverty line needs to be assessed so that no conflict between the program and the User Group Community Forestry Program may exists.
12. Public awareness about the importance of forests and the consequences of deforestation is very important. Public awareness about forest conservation needs to be raised through public media, posters, drama, school education programs, and so on. The local elite, political leaders, social activists, and NGOs should be involved in public awareness programs about forest conservation.
13. Forest research should focus on basic issues of forest conservation at local level so that more realistic measures and policy programs can be devised.

Part 3

Power/Energy Improvement and the Impacts on Environment

Despite sever damages to infrastructure of energy and power in the country by years of war, Afghanistan's power and energy sector has extensive progress in the past 14 years (2004-2017). The Electricity **in Afghanistan** is primarily provided by hydropower. As of 2017, approximately 43% of the Afghan population has access to electricity and in the capital Kabul 70% has access to reliable 24-hour electricity in 8 months of summer to fall, with deficiencies in winter season, due to heavy load and increased consumption. According to Da Afghanistan Breshna Sherkat (DABS), Afghanistan generates around 300 megawatts (MW) of electricity mainly from hydropower followed by fossil fuel and solar. About 1,000 MW surplus is imported from neighboring Iran, Turkmenistan, Uzbekistan and Tajikistan. The country currently needs at least 2,000 MW of electricity, and is estimated that it will need around 3,000 MW to meet its needs by 2020. The Afghan National Peace and Development Framework has identified alternative energy, such as wind and solar energy, as a high value power source to develop.

Alternative energy projects are already being tested across the country, from wind turbines in Hirat and Panjshir Provinces, to solar generated power in Kandahar, Bamyan and housing lightening of 35% of households in almost 22 provinces, through micro hydro dams, to family-size biogas digesters in the country.

Compare to years prior to 2004, which less than 10 percent of its population had access to electricity, with Kabul suffering power shortages, access to electricity in Afghanistan was reported at 43 % in 2017.[16] Transmission lines from the Kajaki Dam in Helmand province near Kandahar were repaired in early 2002. Three hydro-electric power dams provide baseload power to Kabul: the 100-MW Naghlu dam, the 66-MW Mahi Par dam, and the 22-MW Sarobi dam, with the latter two facilities slated to be rehabilitated, under a $16.9 million contract let to Voith Siemens in early 2004. Due to a lack of water flow on the Kabul River, only the Naghlu Dam, which has a sizable reservoir capacity, is operational all-year round to meet the needs of Kabul. The dams are located about 50 miles from Kabul and are linked by a 110-kV, double-circuit transmission line.

Neighboring countries also supply electricity to some of Afghanistan's border regions. Turkmenistan supplies electricity to much of northwestern Afghanistan, including Mazar-i-Sharif and Herat. This arrangement was affirmed in an agreement signed in August 2002 between the Afghan government and Turkmenistan, continuing an earlier agreement between the Taliban government and Turkmenistan. Uzbekistan also supplies electricity to the northern area around Mazar-i-Sharif, supplementing a small local gas-fired power plant. Uzbekistan resumed its supply arrangement in August 2002, after having terminated supplies of electricity in 1999 during the period of Taliban rule. In May 2003, Tajikistan resumed supplies of electricity to the northern Afghanistan province of Kunduz, although

[16] According to the World Bank collection of development indicators, compiled from officially recognized sources, access to electricity is 89.5 % which does not confirmed by other sources.

power supplies were expected to halt in October 2003. Iran also supplies electricity to Afghanistan, in some areas directly adjacent to the Afghan-Iranian border in Herat, Farah, and Nimroz provinces. Reportedly, Iran plans to increase power supplies to Afghanistan's Herat province from Khorasan.

1. Energy supply

Historically, Afghanistan's rural population has been meeting their energy needs from traditional sources like fuel wood, and other biomass resources. Use of modern forms of energy – electricity, fossil fuel etc. are naught or comparatively new and making them accessible in rural areas is still a great challenge to Afghanistan rural areas. The par capita energy consumption in Afghanistan in 2003 was 90 kgoe/a[17], which in 2017 this figure increased 109 kqoe/a. Moreover, it is evident that due to environmental concerns and the need to the improve quality of life, traditional means of biomass consumption are neither sustainable nor desirable. There is still a gap between per capita energy consumption and country's development status. The total energy consumption in Afghanistan estimated around 4,800 million ton in 2006, which translates to per capita annual energy consumption of about 109kgoe/a, ranks among the lowest of the world (Afghanistan Annual report 2007).

2. Manufacturing Industries and Construction

In Afghanistan, a clear evidence confirm that the residential/commercial and automotive sectors, drive most of the energy demand. No comprehensive set of data is available on energy demand from Afghanistan's industry. The one instance of heavy industry in the country (other than hydro power plants) is the Balkh Fertilizer Company (Kod-wa-Barq). This factory works as Fertiliser Plant and Power Plant. The remainder of industry is light, with a preponderance of textile industries (cotton and wool processing, textile weaving). These are not important consumers of energy per unit of value added, but there is evidence that textile plants in Kabul and Kandahar are curtailed because of a lack of electric power. Table lists the country's main industrial plants and what is known of their energy consumption. Many plants are listed but are in effect in operational because of war damage. The pre-war energy demand from industry cannot be taken as a basis for estimating future demand from this sector. Afghanistan now experiences a strong demand for construction materials and has significant mining potential. It is the availability of energy supplies that will drive growth in these industries, whose output would otherwise be imported at a higher cost.

[17] The data is given in kilogrammes of oil equivalent per year, and gigajoules per year, and in watts, as average equivalent power. *Note:Conversion of 1 kilogrammes of oil equivalent (koe) 1 koe = 11.63 kWh or 1 kWh = 0.085984522785899 koe* [4]which does not confirmed by other sources.

Table 3: Major Industries in Afghanistan

Factory	*Region*	*Production capacity*	*Utilization / status*	*Energy consumption*
TEXTILE AND CLOTHING				
Bost Cotton Ginning Plant	Helmand	20,000 tons	100%	
Balkh Cotton Ginning Plant	Balkh	6,000 tons	100%	
Spinzer gining and press Co	Kunduz	20,000 tons	100%	
Guzarghah Textile	Kabul	305 million m of cloth	0%	
Kabul Textile Mill	Kabul	1.6 million m silk cloth	0%	
Kabul Thread Textile	Kabul	1,200 tons of cotton thread	70%	400 kW
Kandahar Textile Mill	Kandahar	6 million m silk cloth 500 tons of wool	100%	500 kW
Kandahar Cotton Textile	Kandahar	40 million m cloth 1,000 tons of wool	70%	2000 kW
Kandahar Wool Weaving Co.	Kandahar		100%	
Herat Cotton Textile	Herat	12.5 million m cloth 500 tons of thread	100% - going concern	1000 kW
Afghan wool industry	Kabul	420 000 m of cotton cloth and blankets	80%	500 kW
Gulbahar Cotton Textile	Kapisa	52 million of cloth and dying	10%	6000 kW
Jabul-us-Siraj Textile	Parwan	6 million m of double cloth	0%	
Bagrami Cotton Textile Mill	Baghram	20 million m of cloth	0% - destroyed	
Afghan Textile Co.	Gulbahar	45 mln. m cloth and 85 mln. m dying	0% - can be partially rehabilitated. Needs power and water supplies	
Balkh Textile Co.	Balkh		50%	
Kabul Textile Mill	Kabul	2.8 million m of woollen cloth	0%	
Ukab shoe factory	Kabul	36,000 pairs	destroyed	
CEMENT AND CONSTRUCTION INDUSTRIES				

Factory	*Region*	*Production capacity*	*Utilization / status*	*Energy consumption*
Herat Cement Factory*	Herat	700 tons / 24 hr	70% of construction work done; 30% of machinery installed	
Jabul-us-Siraj Cement Factory*	Parwan	100 tons / 24 hr	working, needs repair	
Cement plant Ghori-1*	Pul-i-Khumri	400 tons/ 24 hrs	working	400 kg of coal and 3,5 MWh / ton of cement
Cement plant Ghori-2*	Pul-i-Khumri	1,000 tons/ 24 hrs	0%	
Marble Factory	Helmand		100%	200 kW
Bagrami Brick Co.	Bagrami / Kabul		0%	
Afghan Carpenter	Kabul		40%	
Marble Stone	Kabul		0% - destroyed	
Housing construction plant	Kabul	Concrete / building materials complex		
Afghan Construction Co.	Kabul			
Banaye Construction Co.	Kabul	Badam Bagh / Kabul		
Helmand Construction Co.	Helmand			
Dept. of Water Supply and Canals	Kabul			
Construction Material Production Co.	Kabul			
AGRICULTURE, FOOD PROCESSING				
Herat Silo	Herat	200 tons of wheat	100%	
Kandahar Silo	Kandahar	20,000 tons of flour & wheat	0% - non operational, under rehabilitation	
Kabul Silo	Kabul	120,000 tons of wheat 4,200 tons of bread	80% - partly rehabilitated	5,5 ton of coal / day
Mazar Silo			60%	
Phuli Khumri silo			50% - partly rehabilitated	

Factory	*Region*	*Production capacity*	*Utilization / status*	*Energy consumption*
Kunduz cooking oil refinery				
Imam Sahib cooking oil refinery				
Dashti cooking oil refinery				
Helmand refinery				
Khwaja Ghar refinery				
Kandahar Fruit Factory	Kandahar	300 tons	30%	
Nangarhar Sugar Co.	Nangarhar		0% - destroyed	
CHEMICAL				
Khod-wa-Barq Fertiliser Plant*	Mazar-i-Sharif / Balkh	40,000 tons of urea	40% - the plant could produce 105 000 T / yr. if desulphurized gas were available	35 mln. m^3 / yr.
Khod-wa-Barq Fertiliser Plant - Power Generator*	Mazar-i-Sharif / Balkh	37 MW originally, 18 MW now	50%	105 mln. m^3 / yr.
Afghan kleemd	Kabul	60,000 litres of alcohol drinking and medical)	100%	
METAL				
Jangalak Steel Mill*	Kabul	Machines and engines	10% - mostly destroyed, but partly working	225 kWh - 1000 kWh if oxygen plant resumes supplies
Oxygen Factory*	Kabul	1,350 million litres of oxygen	0% - destroyed	
Metal Mining Co.*	Tarakhel, Kabul			

Note: * Firms dependent on the Ministry of Mines and Industries

1. Fuel Consumption data in the construction and manufacturing industry is given in.

Table 3: Fuel Combustion Data for Industrial Sectors

Fuel	Consumption
Gas/Diesel Oil	***54 kt***
Lubricants	***0.054 kt***
Coal	***40 kt***
Natural Gas	***2001.73 TJ***

3. Coal Mining, Handling and Environmental Impacts

Approximate total coal reserves in Afghanistan are 440 million tons and the current coal production in Afghanistan is at over 150,000 Ton annually, of which only 40,000 tons come from the government controlled mines. Coal production data for the year 2002, according to the Ministry of Mines and Industry of Afghanistan are given in **Table** 4. The process of coal formation inherently generates methane and other by-products. The methane will remain stored in the coal until the pressure on the coal is reduced which occur through the process of coal mining. In addition, post mining activities like handling of coal for storage and transmission also produces methane. The fugitive methane emissions from the coal mines, during the annual production of 152,500 kt, are estimated at 224.34 Gg (considering EF of 2 m^3 of CH_4/t for mining and 0.2 m^3 of CH_4/t for post mining; and a conversion factor of 0.67 Gg of CH_4/million m^3 of CH_4). About 30 percent of the gas production (1,445.69 TJ) in the country is estimated to be lost during production and transmission. This will produce about 0.0043 Gg of methane. Co2 emission in Afghanistan increased from 0 million metric ton in 1980 to 3.264 million metric ton in 2017 an average annual rate of 21.16%. Urban areas are the most extensive consumer of coal especially in cold seasons.

Table 4: Coal Mines Data of Afghanistan

Coal Mine	*Province*	*Production (tons)*
Andarab	Baghlan	
Nahreen	Baghlan	10,000 –15,000
Ishpushta	Bamiyan	15,000 –20,000
Klich	Bamiyan	15,000 –20,000
Seaghon, Yaka-Olang	Bamiyan	1,000 – 2,000
Dowab, Mikhi-zareen	Bamiyan	20,000 – 25,000
Sabzak	Herat	5,000
Lal-o-Serjangle	Orezgon	200 - 500
Karkar/Doodkash/Ahindara/ Khordara	Baghlan	40,000
Dari Suf	Samangan	20,000
Shabashak	Samangan	No data

Gazistan	Takhar	5,000
Khas Uruzgan	Uruzgan	No data
Total		***131,200 – 152,500***

4. Oil and Natural Gas Production

Afghanistan has 6 developed oil fields and it is estimated that recoverable gas reserves from these fields is 1,561 ktons. At its peak in the late seventies the gas production reached 2.6 to 2.8 billion m^3 per year. Presently Afghanistan is producing 285 million m^3/year and this amount is decreasing every year. Afghan gas operates approximately 440 km of welded steel gas pipe for transmission and distribution of gas. It is estimated that about 13 percent of gas production in the country is to be lost during production and transmission.

3. Tirpul Oil Basin

The Tirpul basin covers an area of approximately 26,000km2 and is located to the West in the Herat Province. Exploration comprised of geological mapping, seismic survey, shallow structural drilling and 5 deep exploration wells. Over 20 potential structures were identified; 3 were subjected to further deep exploration drilling. In Ahmadabad area, presence of oil in Palaeogene sediments was intersected at 840 meters and 1,190 meters; oil flowed at 6.7 cubic meters per day. With the application of 3-D Seismic and further exploration this area has potential to uncover large deposits in the area.

4. Katawaz and Helmand Basins.

Negligible exploration has been undertaken in these basins and hence remains untested, despite of its favorable geological settings.

5. Exploration and Development

During the Soviet era, exploration and development were confined to Amu Darya and Afghan-Tajik basin, and to a lesser extent, Tirpul basin. Only 7,700 km of seismic profile had been shot and out of the 370 wells which were drilled only 59 were exploration wells. The level of exploration coverage with respect to the total basin size is considered very low. The success rate was 23percent. No further petroleum exploration and development were ever undertaken since 1989, after the exit of the Soviet Union.

Limited volume of oil was produced unlike exploitation of significant gas volumes to the Soviet Union. Angot was the only oil field developed and used for local consumption.

- The Angot oilfield, located 11 km E of Sari-e-Pul city, was the only one that sustained production till present. 15 wells were drilled of which 4 wells are classified as producers.

- The Kashkari oilfield, located approximately 12 km south of Sari –e- Pul city had 10 wells drilled of which 4 were ascribed as production wells with extended flow tests occurring for up to 3 weeks per interval. The Hauterivian sandstone reservoir exists at depths between 1800 and 1950m.

Figure 11: Energy reserves in Afghanistan

No	Energy Sources	1971		1978	
		Million Ton	% of total reserves	Million Ton	% of total reserves
1	coal	55,50	30%	278,6	62.4
2	Natural Gas	112,1	60.6	136,3	30.5
3	Petroleum	4,60	2.5	16,5	3.7
4	Turf			2,2	0.5
5	Water resources	2,8	6.9	12,8	2.9

Note: 1. combustion potential of coal/kg ratio is 7000 Kg calories

6. Electricity and reduction of environmental Impacts

The question therefore arises: how can the national utility (DABS) meet the demand of its existing and additional future customers, given the limited availability of electricity and keeping in mind that for the next three or four years, there will be no additional sources? First and foremost, DABS should try to minimize what are called AT&C (Aggregate Technical & Commercial) losses that, for the whole system, currently vary between 30 to 40 per cent. These losses are caused by technical and commercial irregularities. (4) If DABS is able to reduce these by 10 per cent, it can save almost 450,000 MW hours of energy in one year, with which it could supply electricity to an additional 150,000 households or relieve the existing ones of the load shedding.

Second, DABS should focus on so-called Demand Side Management (DSM) to increase public awareness about how to reduce excessive energy consumption, especially in peak hours. Campaigns would, for example, call upon customers to turn off unnecessary lights or heaters or turn off air conditioners when nobody is in the room. Another approach (see for example here and here) is to apply two electricity tariffs: a lower tariff for consumers who might be temporarily disconnected in peak hours and a higher tariff for uninterrupted supply. The Power Sector Master Plan (PSMP) also discusses another system that is based on a so-called high tariff (HT), which is charged during periods with high electricity demand, and a low tariff (LT) for off-peak periods.

Third, DABS and the government could encourage electricity consumers to use energy efficient appliances. Replacing incandescent bulbs with energy saving bulbs, introducing lower taxes on imported energy efficient products or switching from electrical water heaters to solar water heating are some recommendations included in the 2013 Power Sector Master Plan. If these energy efficiency measures were applied on an individual

consumer basis, energy consumption could be reduced by 20 to 50 per cent, it is calculated in the master plan.

However, these steps can only mitigate the risk of power blackouts and load shedding by a small percentage and cannot offer a substantial solution. The only solution is to increase either indigenous generation or reliable imported supply with sufficient transmission capacity, and this will take at least three years from today, if the government closely focuses on project implementation and secure funding for the unfunded components of the projects mentioned above.

Pressures

Migration flow towards the cities is rapidly increasing. Not surprisingly, lack of work in the rural areas and the perception of better opportunities in towns were the major causes of migration. As might be expected, the costs associated with migration to the cities can be quite high. One of the factor is to access to labor markets in urban which is lack in many urban areas.

Migration from rural and mountainous areas to urban area has accelerate urbanization process unexpectedly. Demands for shelter, employment, electricity, drinking water, and surplus human services including health, food, education, goods etc. created numerous concerns. 70% of urban areas especially 23 major and small cities, has extended with zero consideration of available services and resources including access to electricity. The power and electricity in Kabul and other major city heavily dependent on imported goods and electricity, which has made the situation worst in terms of services availability and electricity. For instance, Kabul social and service infrastructure including transport, road network and electricity supply has been established for maximum 1.5 million population. The recent data indicated the population around 3.7 million, which the requirement for primary service also increase. 210,000 established shelters in planed and unplanned area in 1985 increased to 510,000 shelters with same nature in 2017. Such increases have tripled the requirement of services. Evidence in all urban areas reveals that the pre-conflict shelter with single connection of water pipe, electricity cable and other requirements, have been extended to almost four to eight floor apartment houses or shelters that has maximize the requirements, while there is no much difference in supply channel and left behind as same as pre-conflict.

Part 4

Climate Change and adaptation

Afghanistan is a land-locked and predominantly mountainous country in central Asia, with a total area of 652,864 sqkm. Over 27% of the country lies above 2,500 m elevation, with extensive plain regions in the southwest lying between 500 and 1,500 m. The fertile northern plains positioned below 500m, and it makes it extremely vulnerable to climate change. The impacts has also increased threatening water resources, followed by agricultural sector, which ultimately affect socioeconomic condition persuaded by poverty.

Afghanistan has five major river basins flowing from the central Afghan highlands to all bordering countries.

1. Climate (climate zones, trends in temperature and rainfall)

- Afghanistan is a semi-arid country characterised by cold winters and hot summers
- The overall average rainfall is 250 mm per annum, but there is strong topographically-induced variation between different parts of the country, from as low as 50 - 60 mm in the southwest to 900 - 1,200 mm in the mountainous northeast region
- The majority of the precipitation falls in the form of snowfall in winter and early spring (i.e. between November and April, with peaks in February/March)
- The Asian summer monsoon tends to suppress rainfall over Afghanistan
- Consequently, there is a heavy reliance on rivers and snowmelt for agricultural production in much of the country, particularly the dry rangeland areas which receive very little precipitation
- The country experiences extreme seasonal temperature variations (e.g. daily average temperature in Kabul ranges from -12°C in winter to 25°C in summer)
- Much of the country is at very high altitude, and experiences low temperatures, with the highest regions recording minimum temperatures as low as -46°C in winter. In contrast, the southern plains are particularly hot, with average summer temperatures exceeding 33°C (the maximum recorded temperature is 51°C), and the mean winter (December to February) temperature reaching only 10°C

1.1 Impact on crop productivity (quantity and quality of crops)

- The country experienced repeated droughts in 1963-64, 1966-67, 1970-72, 1998-2006, and 2008-09 which led to significant crop losses
- The impacts of the 1998-2006 droughts were particularly severe and resulted in a shortage of food for over 2 million people (UNEP, Afghanistan 2012). These droughts has reduced the country crop production to the following level:
- 75% of all wheat;
- 85% of rice;
- 85% of maize;
- 50% of potato; and
    - 60% of overall farm production.

1.2 Impact on agricultural practices and water use (changes of water use, herbicides, insecticides, fertilizers)

- The principal climate hazard experienced by Afghanistan is drought, which impacts all provinces as a result of the high dependence on rain-fed crops
- It is observed that water sector will be heavily impacted by climate change
- Changes in rainfall intensity and increased drought frequency and intensity may lead to reduced river flow forcing Afghans to seek costly and less accessible alternative water sources
- Increased demand on stressed and over-exploited underground water sources will lead to the drying up of essential wells and springs, further negatively impacting on human health and livelihood. The drying of wells has already been observed around Kabul city, where the current rates of water extraction in the Kabul basin is already leading to a severe shortage of water
- In addition, increased flooding and erosion will lead to increased silt load in rivers and reduced water quality

1.3 Impact on livestock

- As a result of the predicted increase in drought occurrence, the large numbers of livestock that are currently grazed on what is regarded as ‘barren land’ will either die off or be relocated to higher wetter areas, with negative impacts on human welfare and biodiversity.
- People will likely be displaced from marginal areas as well, and potential drought-induced deaths from climate change amongst nomadic pastoralists such as the Nomads (Kuchi) have been estimated at over 10,000 people per year

10. Impact on fisheries

- Being a semi-arid country the fisheries industry is not highly developed in Afghanistan therefore the impact of climate change on fisheries industry is not significant

11. Impact on forestry

- The forestry is likely to be affected negatively by climate change
- Increased temperatures, droughts and floods are likely to lead to widespread displacement of wildlife through large-scale range shifts (e.g. waterfowl have

abandoned the reservoirs of Dasht-i-Nawar, Ab-i-Estada and Kol-i-Hashmat which have recently dried up)

- In addition, climate change-linked declines in agricultural and livestock productivity will likely lead to increased human demands on natural ecosystems, accelerating the pace of degradation of previously pristine natural areas
- The rate of regrowth of much of the indigenous vegetation is likely to be reduced by the reduction in available soil water as a result of increase drought incidence and changing water regimes
- In particular the eastern forest complex and the northern pistachio belt have been identified as areas of high forest valley at severe risk from climate change

12. Impact on human health, settlement and infrastructure

- Additional impacts of drought include malnutrition, increased spread of diseases, and an increased likelihood of internal displacement as people move from highly impacted areas
- The change in wind intensity, extent, air quality issues such as increased particulate matter pollution is also negatively impacting human health by raising the incidence of respiratory diseases

13. Impacts on Urban *development*

Urban areas are also seeing a significant increase in population growth, and it is expected that the urban population will double within the next 15 years. Major environmental issues in Afghanistan's urban areas include issues of air, water, and soil pollution, access to clean water, and solid waste management. Urban areas are also prime contributors to climate change as they consume some 70 percent of the country's energy and produce nearly half of its CO_2 emissions. The main sources of these gases in urban areas are energy generation, vehicles and transportation, and biomass combustion for heating.

- Environmental effects (frequency and intensity of soil drainage, soil erosion, reduction of crop diversity, etc.)
- The intensity and extent of wind patterns has increased in recent years, reaching as far as Bamyan in the central highlands. Wind patterns reduces agricultural productivity in affected areas through wind erosion of top-soils and damaging crops and livestock
- Desertification and land degradation are associated with drought because people make additional harvesting demands on natural ecosystems

- The reduced productivity of degraded and deserted land reduces the resilience of ecosystems and increases the vulnerability of local communities to further climate change impacts. Records indicate that desert areas have expanded within Afghanistan since 1960, and that the incidence of degraded land has increased significantly over that same period

14. Adaptation (changes exhibited by organisms)

- For sedentary species, increased temperatures, droughts and flooding will increase mortality and reduce species' ranges

- Whilst certain crop species may actually benefit from carbon enrichment and increased temperatures (e.g. wheat, which may experience an expansion of its growing season), it is likely that the increase in intensity and duration of both droughts and floods will significantly decrease the productivity of most species

The impact of climate change on micro-organisms have not been studied until now in Afghanistan.

15. National climate change framework and policies

- The country Climate Change framework and policies are not developed until this date. However a draft version on 'Framework for a Comprehensive Climate Change Strategy should be developed by 2018.

16. National climat change adaptation programmes (NAPA, NAMA etc)

- National Capacity Needs Self-Assessment for Global Environmental Management (NCSA) has been developed for Afghanistan. There has been a package of recommendations that is under consideration.

- National Adaptation Program of Action for Climate Change (NAPA) has been developed

- The Afghanistan Initial National Communication to the UNFCCC on Climate Change has been developed in 2012 by the government in cooperation with UNEP/PCDMB

- The funding request to the Afghanistan Second National Communication to the UNFCCC on Climate Change has been approved by UNFCCC.

- The SNC has been developed. Comments from national study teams, national climate change committee and other stakeholders were incorporated. It will be submitted to UNFCCC by end of April 2018.

17. National climat change mitigation programmes

- Afghanistan has acceded to the Kyoto Protocol, as of June 2013, which opens the door to the Clean Development Mechanism, and the climate mitigation projects funding streams. These include items such as clean tech projects, urban waste, landfill outgassing capture, clean energy and heating projects. The main actors as of March 2014 are UNEP on CDM policy, UNDP on the National Entity, and FAO with a new GEF Climate Mitigation project in development.

Required inputs to Climate Change, Mitigation and Adaptation

- Capacity building of national Stakeholders on different aspects
- Capacity of CC division at the HQ and provinces in all climate change component including funding mechanism and Climate Finance
- Capacity of DNA steering committees
- Build the capacity of civil society and NGOs
- Early warning instruments and capacity development
- Glacial Monitoring program
- Support Climate Change's Provincial cells
- Climate Monitoring equipment including radiometer, CC controller, advanced climate system etc.
- CC Mitigation methods of construction
- Guideline for accreditation of climate change funding mechanism

18. National climate change projects (brief description of projects)

The below climate change projects are currently under implementation in Afghanistan:

- Building Adaptive Capacity and Resilience to Climate Change' is under execution by the National Environmental Protection Agency of Afghanistan with execution support of UNEP/PCDMB. The project will continue until May 2017

- Community Based Resilience for Rural Livelihoods and Environment Management in Afghanistan' is under execution by the UNEP/PCDMB with funding support by DFID. The main theme of the project is to demonstrate the viability of the "Community Based Climate Resilience" approach through sub-projects

- Strengthening Rural Communities, Agriculture, and environmental management in Afghanistan' is currently under execution by the UNEP/PCDMB with financial support of the government of Estonia.

- FAO has been accepted with GEF for a USD 2 Million Climate Mitigation and Forest project, for 2015

- UNEP PCDMB Afghanistan has had its latest USD 7 Million climate adaptation in Eastern Forest Complex, and Pistachio Belt proposal approved for detailed design in March 2014.

19. Current socio-economic and environmental issues and challenges posed by climate change

- Droughts, Food insecurity, Floods, Desertification, Loss of vegetation, Soil erosion, Land-slides and/or degradation, Extreme heats are major issues, that need to be underlined, enter to programs and implement the programs.

20. Key policy issues and challenges on climate change

- These legal and policy instruments are not effectively enforced as a result of limited knowledge and/or capacity of the enforcing authorities. For instance, the hunting ban declared by President Karzai in 2004 is frequently broken by communities that are desperately short of food, and reduction of national forest is largely driven by illegal logging

- The current policy framework for Afghanistan's economic development lacks the overall mechanism and tools for its climate proofing, particularly regarding the integration of climate change risks into Integrated Water Resource Management (IWRM), land use planning and management, drought preparedness and risk reduction plans
- The limited climate-related data availability limits the effective assessment of climate change impacts at a local level
- The Afghanistan Meteorological Authority (AMA) has limited data gathering and reporting capacity, and at present does not have electronic records or a database
- Overall challenges for the government in the management of climate risks include lack of tools and information for climate-proofing development which, if not addressed, will increase the vulnerability of the country

- In addition, such institutions generally lack sufficient financial resources to properly undertake planning activities

Coping and adaptive strategies

- Rapid building of institutional capacity is a prerequisite for any successful adaptation effort within the country

21. Ways forward

- Close engagement with key informed partners in Afghanistan on climate change, especially NEPA, UNEP, MRRD, UNDP, and World Bank

- Ensure engagement in the national development plan activities to make sure any climate change project is directly engaging serious national efforts. Do not create stand-alone efforts, given the duplication, challenges in delivery, and relatively low number of real specialists in country.

- Prepare a pipeline of efforts, which are temporally overlapping, as well as geographically spread in key vulnerable sites (do not put all projects in one year, in one province).

Build a cadre of younger, highly expert Afghans who can engage both in country, nationally to locally as well as internationally, nationally to regionally to globally.

22. Climate Finance Units

The experience of other countries, particularly India, Bangladesh and Pakistan in South Asia for example, has shown that setting up of a centralized mechanism such as a dedicated Climate Finance Unit (CFU) as part of the CCFF can enhance a country's ability to engage with multilateral and bilateral funding mechanisms for climate action. Navigating the world of climate finance requires coordination both within a country and with actors and institutions overseas. The absence of effective coordination results in an overlap of objectives and a dispersion of efforts, making it harder to approach problems holistically, and to effectively use of all the relevant expertise available.

The role of the Climate Finance Unit could be build around eight main functions:

- Tracking of global climate finance landscape;
- Building awareness and capacity at line ministries;
- Accessing readiness funds and implementing readiness programs;
- Pursuing institutional Accreditation under various mechanisms;
- Developing project pipelines and coordinating preparation and submission of project proposals;
- Monitoring, evaluation and appraisal of climate funded projects
- Co-ordinating CCFF – national budget accounting and monitoring use of domestic funds
- Establishment of National Climate Fund

The development of the unit will however need to staged; the functions above are presented in an order in which they need to pursued.

23. International Climate Finance Mechanisms

Brief Information on Climate Change Related Funds and Carbon Trade

23.1 Green Climate Fund

- The Green Climate Fund was established with a mission to advance the goal of keeping the temperature increase on our home planet below 2 degrees Celsius (Paris Agreement also agreed to aim for a more ambitious target of 1.5 degrees Celsius).
- The Fund is a unique global initiative to respond to climate change by investing into low-emission and climate-resilient development.
- GCF was established by 194 governments to limit or reduce greenhouse gas emissions in developing countries, and to help adapt vulnerable societies to the unavoidable impacts of climate change.

*Advanced economies have formally agreed to **jointly mobilize USD 100 billion per year by 2020**, from a variety of sources, to address the pressing mitigation and adaptation needs of developing countries.*

As of November 2015, the Green Climate Fund has raised USD 10.2 billion equivalent in pledges from 38 state governments. GCF's **initial resource mobilization period lasts from 2015 to 2018.**

Many developing countries, have explicitly expressed their expectations from the Fund in their Intended Nationally Determined Contributions (INDCs).

National Status:

- *Afghanistan in its INDC submitted to UNFCCC has estimated the national need of US $ 10.785 billion from 2016 to 2030 to implement mitigation and adaptation measures.*

- *National Environmental Protection Agency of Afghanistan is the Nationally Designated Authority for Afghanistan for GCF and DG/NEPA is the GCF focal point for Afghanistan.*

- *NEPA has already provided no objection to MRRD/UNDP proposal in the Renewable Energy Sector with a estimated budget of US$ 50.24 million (detailed project proposal development may start soon for 4 years duration project)*

- *NEPA recently constituted a 12-member National Green Climate Change Committee under the chairmanship of DG/NEPA with representative from key development ministries.*

23.2. Funds through Global Environmental Facility

1. **GEF Trust Fund**
    2. Created in 1991 and operational since 1994
    3. Funding: Donor pledges commitment over four-year period
    4. Access through implementing agencies (UNDP, UNEP, IFAD, FAO, WB and others) **only**: provide assistance for the preparation and the implementation of the project to developing countries

    Focal Areas

    - Biodiversity
    - Climate Change
    - Land Degradation
    - International Waters
    - Chemicals
    - Cross-cutting theme: Sustainable Forest Management (SFM)
    - Small Grants Programme (SGP)

    STAR Allocation

    - Allocates money for four years to countries- GEF 6 is now in operation 2015-2019
    - Afghanistan is allocated for this period (2015-2019): US$ 11.30 million
        - Climate Change- US$ 3.0 million
        - Biodiversity- US$ 3.91 million
        - Desertification- US$ 4.39 million
    - Afghanistan had projects in GEF 5 and also Small Grant Fund is being operational now.

    National Status:
    - Projects have been designed and being implemented for GEF 5 period (2010-2014) around US $ 11.0 million,
    - Projects totalling around US $ 19 million are being designed for GEF 6 programming period (2015 to 2019) (11.3 million $ is minimum allocated for Afghanistan but we can have projects more than that)
    - Small Grant Fund of around 2.28 million $ is also being implemented to finance projects proposed by NGOs (a maximum of US $ 50,000 is provided for a single project).

2. **Least Developed Countries Fund (LDCF)**

- Established at UNFCCC COP 7 in Marrakesh in 2001 and operational in 2002
- Funding on voluntary basis
- LDCF addresses the special needs of 48 LDCs, which are especially vulnerable to the adverse impacts of climate change
- Mandated to support the preparation and implementation of National Adaptation Programmes of Action (NAPAs)
- GEF manages fund, World Bank serves as Trustee
- Governed by the LDCF/SCCF Council (meetings twice per year)
- Technical guidance provided by the LDC Expert Group (LEG)

LDCF Contingent on NAPAs

- "National adaptation programmes of action (NAPAs) provide a process for Least Developed Countries (LDCs) to identify priority activities that respond to their urgent and immediate needs to adapt to climate change – those for which further delay would increase vulnerability and/or costs at a later stage"
- Completed by 47 of 48 LDCs

LDCF funding for sectors:

- Food and agriculture
- Water resources management
- Ecosystem management
- Disaster risk management
- Early warning system
- Health
- Others

National Status

- One Ecosystem Based Adaptation project of total budget of US $ 4.9 million is under implementation since 2012, and at the last stage of completion.
- Two other LDCF projects are already approved of total amount of US $ 8.6 million (the detailed project document is being finalized and the projects will come into implementation soon).

3. Adaptation Fund (AF)

- Created in 2001 and operational in 2009
- Funding of concrete adaptation projects and programmes at community, country and sectoral levels in Developing Countries Party to Kyoto Protocol
- Funding: 2% proceeds from CDM + voluntary pledges of donors
- Administered by the World Bank on interim basis
- Direct access for Developing countries

Typical supported Activities

- Water resources and land management, agriculture, infrastructure, health…
- Monitoring of diseases and vectors affected by climate change
- Capacity building for preventive measures and management of disasters related to climate change
- Special attention to the particular needs of the most vulnerable countries and populations
- Strengthening existing centres and information networks for responses to extreme weather events

Available Fund for each country: maximum per country per project is US $ 10 million, and the average of supported projects is US $ 7 million
National Status*:* Afghanistan has not approached for this fund so far.

4. *Special Climate Change Fund (SCCF*)

- Created in 2001 and operational in 2002
- Administered by the Global Environment Facility (GEF)
- Funding on a voluntary basis

SCCF Priorities

- Long term and short term activities on:
    - Water resources management
    - Land management
    - agriculture,
    - health,
    - infrastructure development,
    - fragile ecosystems, including mountainous ecosystems, and integrated coastal zone management.
- Like LDCF, SCCF funds concrete “hard” adaptation activities in the form of investments needed for adaptation

National Status: Afghanistan has not approached for this fund so far.

5. Climate Investment Fund (CIF)

A key feature of CIF programming is the role of the Multilateral Development Banks (MDBs). The largest development organizations in the world, the MDBs offer grants and highly concessional financing as well as extensive technical knowledge and experience in project design and implementation. The MDBs disburse CIF resources to support effective and flexible implementation of country-led programs and investments.

Climate Investment Funds supports four key programs:

- Pilot Program for Climate Resilience
- Forest Investment Program
- Scaling Up Renewable Energy Program
- Clean Technology Fund

Pilot Program for Climate Resilience

- The $1.2 billion Pilot Program for Climate Resilience (PPCR), is a funding window of the CIF. Using a two-phase, programmatic approach, the PPCR assists national governments in integrating climate resilience into development planning across sectors and stakeholder groups. Second, it provides additional funding to put the plan into action and pilot innovative public and private sector solutions to pressing climate-related risks.
- The PPCR empowers countries to approach climate resilience in a programmatic manner. Moving beyond project-by-project activities that have limited potential to eject national or sector-wide transformations, the PPCR programmatic approach entails a long-term, strategic arrangement of linked investment projects and activities to achieve large-scale, systematic impacts and take advantage of synergies and co-financing opportunities.
- Giving priority to highly vulnerable least developed countries, the PPCR provides grants and highly concessional financing (near-zero interest credits with a grant element of 75%) for investments supporting a wide range of activities.

Important: Afghanistan has already applied to participate in this program last year but not yet selected. Hopefully from this year, Afghanistan will be among the participating countries.

6. Forest Investment Program (FIP)

- The $787 million Forest Investment Program (FIP), a funding window of the CIF, provides indispensable direct investments in forestry to support countries' development and REDD+ objectives.
- FIP grants and low-interest loans, channeled through partner multilateral development banks, are empowering countries to address the drivers of deforestation and forest degradation both inside and outside of the forest sector to achieve a triple win of poverty reduction, mitigation, and resilience.

To date, $249 million (over 32% of FIP funding) is approved and under implementation for 15 projects expecting $738 million in co-financing from other sources.

Important: *Afghanistan can benefit from this program to reforestation programs of the degraded forest land in Afghanistan. In South Asia, NEPAL and Bangladesh are already participating in this program and benefiting.*

Scaling Up Renewable Energy Program

- Approved in May 2009, is aimed at demonstrating the social, economic, and environmental viability of low carbon development pathways in the energy sector. It seeks to create new economic opportunities and increase energy access through the production and use of renewable energy.

Important: *As a Least Developed Country, and having high potential for the development of renewable energy technology, Afghanistan can benefit from this program to speed up the development of renewable energy technologies in Afghanistan.*

7. Clean Technology Fund (CTF)

- The $5.3 billion Clean Technology Fund (CTF), is a funding window of the CIF. It is empowering transformation in middle income and developing countries by providing resources to scale up the demonstration, deployment, and transfer of low carbon technologies with a significant potential for long-term greenhouse gas emissions savings.

Important: IT will be very difficult to get benefit from this fund. As this is mainly for middle income and developing countries, in South Asia, only India is participating.

8. Clean Development Mechanism and Carbon Trade

Afghanistan is party to the Kyoto Protocol and eligible for participation in carbon trade through Clean Development Mechanism. CDM aims to transfer clean technology and investment in developing countries parties to UNFCCC and help developed countries parties to fulfil their Green House Gas reduction target.

National Status:

- No project has been registered under the CDM in Afghanistan so far. Afghanistan is amongst the very few developing countries that has not benefited from this mechanism.
- Initial work on technology transfer in brick kiln sector is initiated with the objective of registering the project as CDM project
- National institutional mechanism to evaluate and recommend CDM project is already established at NEPA (it is the designated national authority for CDM).

International Situation in Carbon Trade

- In 2014-2015 the price of per ton of CO2 has been the lowest since its start in 2008.
- With the Paris Agreement and need of reducing 15 Gigatonnes of CO2eq. by 2030, (70% of potential lies in developing countries) and the recognition of the market mechanism (carbon trade) as an effective system to help both transfer of technology to developing countries parties and meet the target in developed country parties, the price of carbon is expected to rise significantly.
- Afghanistan need to develop national capacity to promote private sector and key development ministries to benefit from this mechanism in near future.

Key Sector for CDM in Afghanistan

- Development of renewable energy projects (solar, wind, micro-hydro, bio gas, etc)
- Demand Side Management; Energy Efficiency Improvement Projects
- Waste Management (landfill site methane gas collection and utilization)
- Brick Kilns technology change
- Efficiency Improvements in industry sector (co-generation also)
- Making solar lamps in the municipalities
- Promotion of clean modes of transport system;
- Reforestation/Afforestation (REDD+ programs)
- Livestock manure management;
- Others

Important: A Project on “Developing Core Capacity for Decentralized MEA Implementation and Natural Resources Management in Afghanistan” of US$1.0 million is being implemented. It will enhance the national capacity to benefit from Sustainable Forest Management or REDD+ mechanism.

Part 5

Sustainable Development and Environmental Assessment

Environmental Assessment and Sustainable Development is key section in the structure of NEPA. The section has been structured in accordance with Article 22 of the Environmental Law of Afghanistan, 2007 to govern the process for environmental impact assessment of programs, plan, projects activities and any initiative that may have adverse impacts on the environment and health of population in Afghanistan.

The regulations define responsibilities and procedures for the implementation of Article 13 to Article 26 of the Environmental Law , to ensure that all projects and activities are implemented in line with the long term vision of sustainable development of the Islamic Republic of Afghanistan. This will also ensure that all foreseeable negative impacts on the environment related to the project or activities are identified and all feasible measures to avoid and mitigate such negative impacts are fully considered prior to the implementation of any projects/activities.

Progress

To provide meaningful opportunities to concerned private citizens, public and local institutions to participate in the environment impact process is key to this section. The section has assessed, reviewed, and issued compliance license for more than 2300 medium to large projects in Afghanistan including, road infrastructure, natural resources, railway, refineries, industries, agricultural projects, irrigation dams, hydropower, energy, rural rehabilitation programs etc from 2010 to 2017. Around 800 projects and activities that was expected to have adverse impacts have been proposed for introduction of alternative, mitigation measures or rejected. The assessment and review process managed by existing regulations.

Inspection of almost all licensed projects at the country level and provision of possible mitigation measures, guidelines and directives. Capacity of human resources is key to this section. Efforts have been made to build the capacity of existing staffs, updating technical knowledge, and provide opportunities to exchange experience and knowledge at the regional and international level.

1. Strengthening the existing capacity (technical and practical) on Environmental management, Environmental and Social Impact Assessment (ESIA) and sustainable development
2. Legislative framework
3. Sustainable development and
4. Natural Heritage protection and assessment of potential areas incl. legislative framework and PA Management, ecosystem health etc
5. Environmental inspection
6. Environmental planning
7. Integration of environmental and economic analysis
8. Legal Framework enforcement, good number of legal and policy instruments that need to incorporated into national and in some cases regional policies

1. Improved licensing system
2. Capacity building of private national entities and professionals to develop quality ESIA reports
3. Twelve different recommendations on permitting and compliance for immediate attentions to improve the current systems and procedures
4. Establishing a road map for an effective regulatory framework
5. Environmental Permitting and Compliance System
6. Managing the ESIA process in the middle term as it relates to the large projects (with extension to oil/gas projects and other minerals); managing the ESIA process for small scale and artisanal mining operations (notably quarries); and implementing SESA priority recommendations.
7. Environmental Laboratories at NEPA and Accreditation of System for Private Laboratories

Urbanization and Environmental Challenges in Afghanistan

1.0 Urbanization in Afghanistan

According to the classification of cities in Afghanistan, a place with 5000 or more population is classified as city, in terms of settled population. If we compare the urban population of 24.7% of Afghanistan to the world average of 53.6% of urban population (The World Fact Book), Afghanistan is a rural country with only 1/4th of the national population living in cities. Although the CSO estimated the urban population in 66 cities, more than fifty percent of urban population exactly 55% is concentrated in Kabul, the capital city of Afghanistan. Out of the 66 cities, only ten cities have population more than hundred thousands, Kandahar is the second highly populated city with 9% of national urban population followed by Herat with 8%, Mazar-e-Sharrif with 7%, and Zalalabad with 3% urban population. In other 57 cities only 18% of the urban population reside. While analyzing the urban growth and environmental challenges in cities, the case of Kabul is highlighted here.

The annual growth rate of urban population of Afghanistan is amongst the highest in the world with 3.97% (2010-2015 estimate) and if it continues to grow in this rate the population of Kabul will reach to 5 million in 2022 and 10 million in 2040, making it a mega city of the world. This rapid and haphazard urbanization in Kabul and also in other major cities has put significant pressures on the city infrastructures. According to ANDS, the number of challenges and constraints faced by the Afghan urban sector are:

- Low coverage of basic services and inadequate public resources to meet growing needs
- A rapid pace of urbanization partly due to returning refugees and rural-urban migrants, leading to high population density
- Widespread urban poverty and limited access to productive employment
- A high proportion of informal settlements and associated problems
- Lack of capacity and coordination among urban sector institutions

- Limited scale of private sector investment in urban enterprises, facilities or services
- Lack of accurate data on which to base critical policy decisions
- Land security and titling: absence of proper land registration system, land grabbing, inadequate legal instruments and institutions
- Lack of available financial funds due to limited interest of donors in the urban sector,

As the main focus of this article is on rapid urbanization and challenges of managing the associated urban environmental problems, efforts are made to look into the drivers for urban pollution, current status on the pollution level and its possible impacts, and the effectiveness of initiated efforts, and the way forward.

2.0 Urban Environmental Problems

The pace of rapid urbanization in Afghan cities particularly in Kabul has led to increased pressure on the environment in terms of air pollution linked to increased transportation, an increase in solid waste, the depletion and degradation of the fresh water supplies, soil degradation, and noisy environment. Afghanistan lacks reliable data on environmental quality and only scattered information are available. Efforts are made to provide status on these key environmental problems in Kabul and how it is impacting the life of millions of people living in this capital city.

3.0 Dealing with the Urban Environmental Challenges

Over the years, Government of Islamic Republic of Afghanistan has taken institutional and regulatory initiatives towards addressing the urban environmental challenges in Kabul and other cities in Afghanistan. In 2007, Afghanistan got the umbrella law on Environment, the Environment Law 2007 which makes creating pollution a punishable act. National Environmental Protection Agency of Afghanistan is the national institution made responsible for the implementation of the provisions of the law to ensure that the fundamental right of citizen to live in a clean and healthy environment. Major policy and legislative initiatives and efforts towards compliance of regulatory requirements are briefly discussed below.

4.0 Urban Environmental Compliances and Inspections

Environmental Compliance Inspectors perform routine investigations of certain urban sites and other areas to assure that all activities, projects, programs are compliant with approved environmental laws and subsidiary regulation. As a result, they are an essential component for protecting the health of publics, environmental integrity of lands, air quality and water quality. This section involves in all sectors including markets, municipal and urban infrastructure, businesses, small to large industries, production, consumptions, quality of services, as well as an ability to accurately record the compliance level of a particular site.

Environmental Compliance Inspectors work both in the office and out in the field, striking a spectacular balance between the varied and the routine. Most Environmental Compliance Inspectors hold a bachelor's degree in environmental science, agriculture, law, or other associated field of studies.

Environmental Compliance Inspection search sites for environmental code violations and take proper actions to restore compliance at the site. The section also look through various permits, licenses, and records to assure that everything has been done correctly. They must also remain informed and updated about the latest regulations relevant to their field. After finding a violation, an Environmental Compliance Inspection may be required to follow-up with the case and ensure that compliance is not an issue in the future.

4.1. Water Pollution and Impact

Water resources are being polluted due to disposal of untreated industrial and domestic effluent, and the discharge of household and street waste directly into streams. In urban areas, most of the demand of water is supplied from groundwater sources; cross-contamination is a significant issue. The 2003 UNEP Post-Conflict Environmental Assessment found that urban drinking water supplies are often being cross-contaminated with coli form bacteria. This is due to groundwater extraction wells being placed close to solid waste and liquid waste disposal points; the existence of open sewers; lack of urban wastewater treatment plants; and lack of properly designed solid waste landfills.

A Scientific Investigation Report in Afghanistan on “Groundwater Natural Resources and Quality Concern in Kabul Basin, Afghanistan”, by M. Hassan Saffi, Hydro geologist, November 2011 also draws a serious concern for the water quality in Kabul. The main conclusions of the report are:

- Kabul Basin groundwater main quantitative concerns are: declining water table exceeding the recharge trend; depletion of natural storage; water logging and salination; and perhaps land subsidence.
- Kabul Basin groundwater main qualitative concern is: progressive increase of salinity with time; hard and very hard characteristic of carbonate hardness; progressive increase of nitrate concentrations with time; progressive increase of coliform bacteria; and progressive increase of boron concentrations.
- The high rate presence of fecal coliform Bactria and high concentrations level of Nitrate indicates that Kabul Basin’s drinking water systems are contaminated by fecal coliform (microbial pathogens) and nitrate (anthropogenic) contamination and pose a threat to the health of Kabul’s inhabitants.

The discharges of untreated industrial, commercial and domestic wastewater into drains and water bodies and also the dumping of hazardous and toxic wastes into land and open spaces must have resulted in contamination of the ground water resources with toxic pollutants, and no studies on such pollution issues are available for Kabul, neither the impact on human health.

4.2. Decrease of Water table in Urban Areas

Urban areas are seeing a significant increase in population growth, and it is expected that the urban population will double within the next 15 years. Major environmental issues in Afghanistan’s urban areas include issues of air, water, and soil pollution, access to clean water, and solid waste management. Urban areas are also prime contributors water supply

and contamination through use of water and dispose of wastewater. Urban areas consume some 80 percent of ground water for different purposes including environment and sanitation. Low capacity of central water supply structures, scattered water supply, unrestrained use of ground water, construction on surface water basins and encroachment and illegal activities on urban aquifers have caused serious threats to and a major decrease in water table. Low capacity of central water supply causes drilling of more than 180000 shallow and deep wells in 6 major cities, with daily consumption with optimistic scenario is around 144,000 M3. In the case of population trends, the total consumption increased 780,000 M3 a day.

- Extend central water supply system to avoid scattered use of ground water
- Use of water recycling mechanism for irrigation and flash system in urban areas
- Wastewater Management and of proper solid waste management in the areas and drainage system
- banning of excavation activities, based on Mining and Water Laws and water Quality regulations,
- limiting the development of commercial activities
- limiting further development of settlements
- Use of environmental harms mitigation mechanisms such as ESIA for critical activities
- Regulate use of freshwater for construction (use of recycled water)

4.3. Solid and Hazardous Waste Management Challenges

With increasing population and changing lifestyle, management of solid waste including hospital and industrial hazardous waste is major urban environmental problem in Kabul and other major cities. Contamination of the environment by hazardous waste is a growing issue for low- and middle-income countries like Afghanistan. Lead and other heavy metal pollution that results from inadequately controlled formal and informal sector battery breaking, recycling, smelting, and related activities is a major environmental threat in urban areas throughout Afghanistan. While lower at the regional and global level, the total annual solid municipal waste produced in the country exceeds 1.7 million tones including rural areas and small bazars. Despite efforts by responsible government bodies, the recycling and smelting industry is poorly regulated and many operations are conducted in the open air in densely populated urban areas without any pollution controls.

The mixing of domestic hazardous wastes and industrial hazardous wastes with domestic waste makes the whole waste hazardous waste. Segregation of waste at source is the major challenge in Afghanistan. Another big concern is the use of incinerators without any pollution control technologies in hospitals transferring the toxic pollutants to air and making more people exposed to toxic pollutants. These days throwing electronic wastes into the domestic waste is also a major concern in Kabul and other cities.

The challenge is lack of the properly designed and managed landfill sites for both domestic waste and hazardous waste and very poor collection efficiency of the responsible authorities and poor public awareness on segregation of wastes at source.

Soil Contamination

Another serious concern these days is the soil contamination due to small scale industrial pollution and dumping of municipal and hazardous wastes in land. Contaminated water sources directly affect the agriculture production in suburban areas. Crops absorb the toxins, thereby contaminating food for human consumption. Urban communities are affected by both direct exposure to the pollutants and bioaccumulation through the food chain. Except, collection of used batteries, yet, there is no mitigation mechanisms in hand to reduce soil contamination. A number of relevant legal frameworks have been developed, that needs enforcement.

Noise Pollution

Because of road traffic, industry, and construction activities, cities are becoming noisy places to live. Noise not only makes hearing, concentrating, and working more difficult, noise disturbs sleep. Long term exposure to noise from road, and air traffic results in physiological and psychological stress, which indirectly may contribute to heart disease, and high blood pressure. Chronic or repeated exposure to sounds at or above 85 decibels can cause hearing loss. Efforts are being made so far to monitor the noise quality in Kabul and to assess its impact on the health of citizen. A regulation for noise pollution prevention has been gazetted and enforced in 2016.

5. Solid Waste Management

Solid waste is an inevitable by-product of human activities. In the past, this was not a major problem because almost everything was reused or recycled technical or traditionally, and whatever remained was taken care of by nature. However, the introduction of new materials and changing consumption patterns, especially in urban areas, have resulted in increasing volumes of waste and, as a result, breakdown of traditional systems of waste management has taken place. In Afghanistan, as in many other developing countries, these changes have taken place rapidly over the past few decades, while the government and the people have failed to realize their serious implications and the urgent need to address them. As a result, many cities in Afghanistan are now suffering from the adverse impacts of unmanaged wastes of all type. The problem is acute, particularly in large cities like Kabul, Hirat, Mazar-i-Sahrif, Jalalabad, pulikumri, Kandahar. Therefore, there are 49 other small cities and bazars, of which 17 are extremely suffering of improper management of wastes that has led to environmental pollution, public health hazards, and adverse effects on urban economy. In a country with low literacy rate and rapid population growth, import of disposable goods create many health and economic hazards, which has become a fashion even for low income citizens.

In addition, depending heavily on imports of goods and services, the flow of disposable goods and its immediate wastage made it difficult to manage. The economy in transition and market economy persuade the companies to import substandard goods.

According to a study, approximately 2789 ton solid waste per day in 23 big and small cities and around 43 small towns and bazars in Afghanistan producing. This exclude cleaning of drains in major cities which composed of black water mixed with waste and clay. The recent observation of municipal drainage cleaning process, indicate that a huge amount of drain wastes accumulate in roadside for minimum 5 days, until become drain and transfer to landfills. The surplus dried dust pending in roadside grounds have been emitted in air which reduce the quality of year predominantly. Totally, 6260 manual labors, 323 trucks, 66 open pith landfills have been operational in Afghanistan. There is no major facilities to reduce, reuse and recycling wastes. Environmental regulation has clearly banned informal landfills and waste management, in and around cities, except in a distance to cities, which is not considered properly. No proper landfill exists. It is not only that citizens neglects the rules, but also, government institutions, international and expats working in Afghanistan laws as well. There were open burning incineration by coalition forces in the past, which regulated afterward by engaging private contractor for the management of solid waste and wastewater. E-waste in army basis were another concerns. A small example of mismanagement of waste by international workers, are a published findings from inspections SIGAR conducted between 2012 and 2014 at Forward Operating Base (FOB) Salerno, Camp Leatherneck, FOB Sharana, and Shindand Airbase, which belongs mostly to the international workers in cities indicates worse conditions. One quarter ($20.1 million) of the total spent on incinerators was wasted on eight incinerators that were never used. Part of the reason they sat idle was because of poor planning by the military, including unfeasible physical layout and electrical deficiencies.

Contractors were paid in full for incinerators that were never completed or were in defective condition. At FOB Salerno, the U.S. Army Corps of Engineers took possession of incinerators plagued with numerous defects, including rusted equipment, leaking hydraulic lines, and missing pipe insulation. At FOB Sharana, the contractor delivered the incinerators to the base two years late and in a condition that would have cost an extra $1 million to fix. It should be pointed out that failing to hold contractors accountable for poor or incomplete performance is not limited to solid waste disposal. SIGAR has documented other instances when construction contractors were fully compensated for botched or unfinished projects.

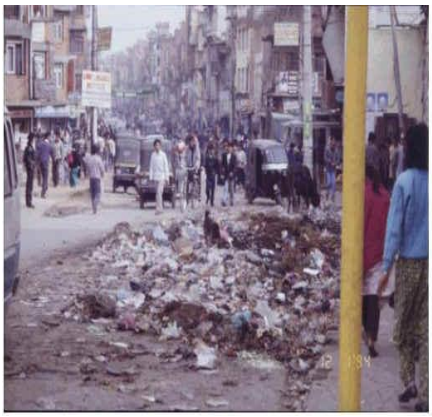
Production and disposal of clinical waste is another major threat in the country, especially in urban areas. The recent efforts by NEPA, resulted some workable management of wastes in military basis, which yet to be work out. Lacking incinerators personnel were forced to dispose of solid waste in open-air burn pits, a disposal method that poses long-term health risks. Hazardous materials such as plastics, tires, and batteries were often burned, in violation of national laws.

It was found the overall approach to solid waste disposal in Afghanistan is “haphazard and reactive.

5.1. Pressure

Urbanization in Afghanistan is characterized by rapid and haphazard growth. This has exerted tremendous pressure on the urban environment as well as on the capacities of the government and the people to manage this change. One of the most visible indicators of this growth is the heaps of garbage that can often be seen littering the city streets or at dump sites on river banks and in other public places.

With about 25.2% of the total population living in towns (municipalities with around 9,000 persons), Afghanistan is still predominantly a rural country. However, the rate of urban growth, could be the highest in South Asia, and a major concerns. In 1970's, only small per cent of the total population of 16.5 million resided in urban areas, of which the majority lived in the Kabul city. In the subsequent population census years of 1979, 1980, the number of people living in municipalities grew by 10 %, and 13% respectively. Between 1981 and 1991, the total municipal population grew by 57% while the rural population grew by only 12%. It should, however, be noted that more than 43 smaller municipalities in Afghanistan have settlements with rural characteristics.



The Kabul city, which is the capital city of Afghanistan along with five other municipal towns, Hirat, Mazar-i-Sharif, Kandahar, Jalalabad and Kunduz, is the main urban areas of Afghanistan. Although its relatively share of the total urban population in Afghanistan, its population is still growing at an increasing rate. In the 1970s, the Kabul city population grew at an average annual rate of 4.6%, while in the 1980s the annual growth rate went up to 6%. Assuming the decline in growth rate in the 1990s as in the 1980s, many urban population fled to neighboring countries because of the conflicts and the imposed migration, the city's urban population has had declined to almost half. In 2000's onward the population growth crossed around high percentage. Kabul, which is the largest and fastest growing city within the country, now has a population of over 3,7 million.

Migration to cities, especially from the mountainous areas of Afghanistan, in search of jobs, education, and other opportunities, is the main cause of rapid growth in the urban population. Many of them are farmers prior to migration, while the others unskilled young labors and service holders. This indicates that the main cause of rapid urbanization in the country is the inability of villagers in the rural areas to sustain their livelihoods with the very primitive and traditional agriculture only.

Although in line with per GDP grows, urbanization itself is not necessarily a problem as it promotes economic activities, but alleviates pressure on land resources, haphazard and unplanned urban growth generally invite many environmental problems such as public space and river bank encroachment, air and water shortages and pollution, and solid waste generation. Among these, unmanaged issues, low air quality and solid waste seems to be the most visible problems.

Changing consumption patterns and breakdown in the traditional systems of waste management also contribute to the problem of waste management in urban Afghanistan, especially in the city of Kabul. Until now, almost all of Kabul and other major city's waste (organic & inorganic) is not recycled. In many cities elsewhere, the organic waste is to produce compost and to be sold to farmers. It is believed that with the support of a world Bank project to Kabul municipality, the dumping of organic and inorganic waste in Kabul will reduces the traditional system used in the past decades, (World Bank and Kabul municipality 2007). Selling of waste generated in households is not common and there is no individually collecting system yet, except involvement of private sector in 3 municipal districts of Kabul city. The pilot project of waste management and collection by private sector is believed to have positive impact on the removal of waste down the streets and has reduced the pressure on the Kabul municipality and its 18 district units.

Nowadays, either the traditional and municipal systems have vanished or the composition of municipal waste has also changed with the introduction of new materials such as plastics, paper, glass and many other organic and non-organic matters. As a result, most people now dump their waste on the streets or in other public places and only a very small portion of the waste is transported to dumping areas which has not been systematic. During the conflict and afterward the mini recycled system of plastic has also vanished.

Years of conflict and neglects have left all major city's infrastructure in ruins and Kabul City is the top. One of the most pressing problems facing the city is the accumulation, the current generation and the disposal of solid waste. This problem is especially acute in Kabul, which has experienced rapid urban growth due to a large number of returnees and new urban dwellers (a daytime population of 3.4 million, and about a 300,000 floating population) and the increase in waste from growing economic activities. The absence of an effective strategy to deal with the problem and the municipality's lack of capacity, it seems difficult to respond. The capacity deficit is reflected in the estimated 70% of total solid waste that is accumulated on roadsides, back yards, in drains, rivers and open places, and represents a significant environmental hazard.

City-level solid waste collection and removal; capacity-building activities; neighborhood-level organization; and, community awareness-raising and education are the most essential parts of municipal waste management. The program established house-to-house solid waste collection by introducing the "Karachi System", whereby communities pay collection workers to remove the household waste and take it to the city collection point have been effective only in removal of waste from households to local stations. In many cases, municipality has been able to remove local dumped waste to legal dumpsites partially.

5.2. State and Impacts

Compared to other countries, Afghanistan still generates very little waste and most of what is generated is not hazardous and easily recyclable. Therefore, the increasing volumes of waste being generated would not be a problem if waste was viewed as a resource and managed properly. This, however, is not the case as most of the waste is just dumped in

public places. This is causing problems related to environmental pollution and public health, especially in the big cities.

1. Municipal waste

A few very primary studies prepared on waste generation in Kabul city indicate that the per capita waste generation is low compared to most other countries and that about two-thirds of the waste materials are organic. An estimation revealed the per capita waste generation rate in Kabul is approximately 0.25 kg to 0.5/day. Consideration of this rate. Based on the figures estimated for the urban population and the assumption of per capita waste generation ranging from 0.25 to 0.5 kg/day depending on the size of the city. It is estimated that, in 1999, the residents of the country's 10 provincial centers generated approximately 713,000 MT of municipal waste annually. This accounts for about 83% of all solid waste generated, while the estimate in 2017 has been extremely high to 1017965 MT in the mentioned municipal cities and bazars in Afghanistan. Comparison, agricultural waste may accounts for 13% and small scale industrial waste for 9% of the total solid waste.

Very few studies have been carried out on the impacts of municipal waste on the surrounding environment and human health. One major impact of municipal waste is on the health value of rivers flowing in some cities, and the open ditches around and the health of the street people working with waste. Throwing household waste into local streams has affected the quality of water in local streams as well as the aesthetic value of the city of the Kabul and Jalalabad and Pulikhumri. Kabul river is one of the most polluted streams in the country. With regards of health hazards to municipal sanitary workers in Kabul, ministry of public health indicates that scheduled caste people working with municipal waste management, particularly have become prone to health hazards on account of their lacking awareness of the changing pattern of waste and of not using protective measures while collecting it. Engagement of women as municipal waste management's manual workers in Kabul in recent years, while an initiative of gender equality, but with such a low awareness and literacy rates, it might affect the health many lactating mothers, following the infections of infants and children. Aside from municipal waste workers, most of the waste collector in Kabul and other major cities are children (6-17 years old). The impacts are observed on their physical body. This may also impact other children, because they often play each others while working and collecting municipal waste. Because there are no protective measures, such workers most likely carry the pathogens from their working places and may transmit them to other family members at home.

2. Hazardous waste

Due to the low level of industrialization and limited use of hazardous chemicals, such as pesticides and persistent organic pollutants in cities, it is safe to say that Afghanistan probably generates very little hazardous waste compared to other countries. There are few items of hazardous waste that is prohibited elsewhere, but used in Afghan cities, including bullets, plastic toys, amounts of flammable powders used in children toys etc. Hazardous waste is, however, a major concern because the small amount that is generated is not properly managed can be harmful. Despite, imposing a ban on import and use of such

items, no strict actions have taken to stop, to minimize the potential environmental and health risks associated with such waste. This is because of low understanding of policy-makers and society of the impacts as a whole.

Main types of hazardous waste generated in the country are medical waste, obsolete pesticides, batteries, used engine oil, and a few types of industrial waste. On the occasion of air Quality management program in Kabul city, the author estimated that a total of 2850 hospital beds in Kabul generated approximately 205.2 tones of hazardous waste per year. Most of the waste is mixed with other garbage and is either dumped or burned in ordinary kilns. Lack of incineration systems in the hospitals have exacerbated the situation.

Obsolete pesticides or pesticide containers can also be classified as hazardous waste. Currently, tones of hazardous obsolete pesticides are stockpiled in unsafe conditions at various locations in the country. Even, good amount of DDT powder and Carbo furan have been observed in major cities, imported from Pakistan and Iran[18]. The total consumption of pesticides in the country has not been determined yet to show the active ingredients per year (author 2016). According to an observation in 2008, the pesticides use in Afghanistan is common which applies in direction of local supplier nor the technical experts. As per a study on the social environment and traditional conservancy knowledge in three provinces, it was found that 98% of formers are illiterate and can not read even the labels in local languages of such items. The survey also revealed that all farmers use any kind of pesticides without understanding the demands and type of agricultural process. Very few farmers check the indication of date. Dump and or buried is not common. Regarding the fate of empty pesticide containers, many of them are threw them away or use them for other purposes which finally to be thrown away. These data indicate that, although the amount of pesticides consumed in the country is relatively small, mismanagement of pesticide waste is a problem.

Used batteries are another source of hazardous waste in the cities and bazars, because of the heavy metals they contain. All used wet batteries from vehicles are to be re-fixed or to be collected by the very few battery manufacturers for recycling, while dry cells are normally disposed of with other municipal waste. NEPA has in some cases, regulated export of used batteries, under the Basel Convention's transboundary movement of hazardous waste from 2013 through licensed dealers. With the heavy traffic and vehicles in major cities, it is likely to consumes great quantity of batteries per year. Assuming that each cell weighs 50 g, the total amount of dry cells disposed of per year could be hundreds of tones. In addition, more than 10 tones per year of hazardous waste are generated from the battery manufacturing factories in the country. . In 2016, there are around 931,200 vehicles registered inside the country, but good number of vehicles have left un-registered especially in bordering provinces. The annual used batteries in the country is around 423000. If recharging system neglects, there would be more than 500,000 used batteries changed to waste. These are mostly accumulated in the cities and relevant markets. Each battery contains heavy metals, lithium, Pb, and 1.5 litter of acids.

[18] (SEA volunteers/south Afghanistan/2005/)

3. Persistent Organic Pollutants

The National Environmental Protection Agency of the Islamic Republic of Afghanistan has prepared the National Implementation Plan (NIP) in partial fulfilment of its obligations under the Stockholm Convention on Persistent Organic Pollutants (POPs). The Stockholm Convention came into effect in 2001 and Afghanistan acceded in 2013. The Convention exists to eliminate or reduce the release into the environment of POPs, a class of highly toxic and stable chemicals produced by human activity and which accumulate in the environment and are transported and concentrated in certain regions by atmospheric circulation.

Agriculture is the primary mode of subsistence in Afghanistan and engages 80% of the population, but produces only 24% of the GDP. Afghanistan ranked 171 out of 187 countries in the 2015 UNDP Human Development Index, and ranked the lowest in its region of South Asia. Life expectancy was 61 years and under-five mortality was 94 per 1,000 live births. Much of the population continues to suffer from shortages of housing, clean water, electricity, medical care, and jobs.

Despite investment by the international community, the country's infrastructure, which was heavily damaged during the war years, remains inadequate to the needs of a growing population. Proven mineral resources, valued at US$3 trillion, promise future economic growth. Meanwhile the economy remains heavily dependent on foreign aid.
Afghanistan has a diverse natural environment, ranging from high alpine with permanent snow and glaciers to hot lowland desert. It thus supports a wide diversity of wildlife with a high level of floral endemicism. It also lies on main bird migration routes and its limited wetland habitats are of considerable international importance.

It is not possible to measure the direct impact of POPs on the health of the Afghan people or on the natural environment; however, both remain highly vulnerable. In the cities, there is a high level of atmospheric pollution from the use of organic fuels which are known to produce dioxin-like substances. End-of-life products liable to contain POPs, are disposed of in solid waste from which they may leach into water courses and groundwater on which most people depend for their domestic supply. Industrial waste water mixes with domestic sewage and both are discharged in water ways without effective treatment. Only one of Afghanistan's drainage basins discharges into the open sea. The rest drain into inland basins and wetlands, where the accumulation of toxic chemicals will be most damaging.

A largely qualitative inventory of POPs releases in Afghanistan has been made, which identifies clear national priorities for addressing POPs. The most significant is the unintended production of dioxin-like substances from the use of wood and coal for domestic heating and cooking. Also of major importance is the disposal of end-of-life materials manufactured while POPs such as the brominated fire-retardants HBB, PBDE and HBCD were in widespread use. It is impossible to estimate the quantities that may exist in the country as no statistics of imports exist for the relevant period, but any there are will be released into the environment unless the materials that contain them are disposed of in an environmentally sound manner. The same considerations apply in relation to PFOS in textiles, plastics, synthetic carpet and paper products among many

others. This is complicated by its continued acceptable use under the Stockholm Convention for aviation hydraulic fluid, fire-fighting foams and certain medical devices.

The final significant source of POPs that was identified was the remains of the pre-war electrical distribution system in which cooling oils containing PCBs were used in transformers. Over 3000 transformers from this period remain in Afghanistan, some still in use. Less significant, but worthy of note, are contaminated sites where HCH were stored for locust control until the 1990s and incineration of medical waste.

Based on these priorities, chemical action plans have been prepared, involving a number of responsible ministries and agencies. Most importantly, these include ongoing strategies to reduce air pollution and to improve management of solid waste. The electrical supply company, DABS, will undertake a survey of the remaining old transformers to determine their condition and make plans for their replacement and disposal. The Ministry of Public Health has an ongoing project to equip government hospitals with modern incinerators. These POPs action plans also include setting standards for products and materials that exclude POPs, and the Customs Service will develop Tariff Codes to identify commodities liable to contain POPs.

5.3. Responses

The most common response to the problem of solid waste management in Afghanistan is the term of “eversight, & never mind”. The attitude of most people as well as the authorities are to sweep the streets and dump the garbage in an area where no one will complain. Waste is often treated as a nuisance rather than a resource, and the long-term implication of poorly managed waste is not considered seriously. The country is in the process to formulate policies on waste management, but implementation of these policies require technical and financial resources which is clearly lacking at present. In recent years, however, the waste management crisis in Kabul and other major cities are a challenge, the environmental organizations prompted citizens, local community groups and the municipalities to make some improvements. Although, it is a positive starts, but needs strict follow up associated with public awareness. There is now an urgent need to build on these efforts and coordinate the activities of the government, municipalities, and local communities.

1. Central government

Managing and convincing municipalities in all cities to identify and legalized destined dumping sites instead of the existed one close residential and commercial areas. Decentralized municipal system and second authority to municipal district office for improved waste management services. Capacity raising and upgrade municipal network at the national level. Strengthening provision of necessary support as well as proper coordination between concerned NGOs and municipalities. Close links between environmental protection authorities and municipalities are symbol of co-working process, that needs to be created. To make solid waste management simple and effective

- Minimize environmental pollution and adverse effects on public health caused by solid waste, in accordance to NEPA strategic short-medium and long term plans and goals.
- Mobilize solid waste as a commercial resource to support urban economy through waste to energy, waste to compost and waste trade mechanism
- Engage private sector and privatize solid waste management
- Obtain public support by increasing public awareness about waste management. Although the National Policy is supposed to be a good start on the part of the government to address the issue of waste management.
- Promote House to house segregation system, the mechanism of reduce, reuse and recycling system, by motivating people engaged in the recycling business
- Make legal provisions for mobilizing NGOs and the private sector effectively in the field of waste management

Strengthening NEPA's policies and legislation dealing with hazardous waste and other wastes. There are literature and regulations to indicate that the government define hazardous waste or has had issued standards for its management. Now, it is cleared which government agency is responsible for dealing with issues related to hazardous waste. The government has initiated a program for hazardous waste management in accordance to ENVIRONMENTAL ACT (1386/2007) and relevant conventions especially, transboundary movement of hazardous waste and other waste.

2. Municipalities

At present, the municipalities are totally responsible for solid waste management in all large to small cities. Municipalities have given financial management authorities to remove the system of poor crisping. Although it is a move in the right direction, most municipalities do not have adequate resources and technical capacities to manage their waste effectively. As a result, most municipalities are now struggling to mobilize resources just to meet their regular expenses. The municipalities of Afghanistan are therefore unable to spend enough on waste management, especially on capital investment for the purchase of equipment and the construction of infrastructure. Most municipalities are only involved in sweeping streets and dumping the waste along a nearby river or in a public place.

Kabul, Mazar-i-Sharif and Hirat is the only municipalities with a landfill site. The Kabul landfill site in Botkhak is, however, not environmentally safe, due to absence of liners and leachate collection, or a treatment system. Currently hundreds tons of waste from Kabul city are dumped on daily basis. Compaction and covering system with soil has not been considered properly. Hazardous medical waste is also disposed of at the site.

Chamtala landfill site which was the only site for more than 35 years, has been converted to illegal residential areas. Health impacts and prevalence of disease in the areas is tangible, because the area has been encroached and developed without consideration of infrastructural best practices, rigidity for buildings and health effects, at present hundreds mud and brick made houses are constructed. Any infrastructural collapses, and chronic health impacts are expected especially very dry and very wet seasons. Similar concerns have also expected in other populated cities, if proper and systematic approaches is neglected.

The municipality and other responsible departments, has not yet been able to prohibit the illegal constructions in all major cities. Rate of new buildings without proper visa and studies especially land use, use of water, wastewater issues etc.

Yet, there is low understanding of environmental regulations including Environmental and Social impact Assessment of all type of projects and activities,

Although the exact amount of resources allocated to waste management by municipalities are not known, the number of municipal staff involved in waste management indicates that most municipalities still do not consider solid waste management to be a priority sector in which a significant amount of investment is required.

3. Citizens

Most urban residents dumped waste in public places or in fixed sites along the streets. Yet, there is shortages of 'fixed sites' which have not been delimited or marked in any special way. A number of fixed sites in cities have simply developed through use of waste containers. Since children are the households principal collected trash movers, almost 70% of trash and wastes dropped around the containers, instead inside. This has made local collections more complex. Because, collection of bottles, cans, plastics happened before load and moving to landfills. Municipality workers and trucks collect the garbage and waste from fixed accessible sites. Many residential areas are not accessible because of narrow streets and unmanaged housing system.

Almost all households owned a toilet and local latrines. They do not throw organic waste in it. The few existed public latrines in the cities especially Solabs, are used by citizens, but lack of sewerage and urban canalization system and sometimes water makes it improper. An earlier study also indicated that in the cities only 25% of the urban population were served by the Municipal Solid Waste Management units in major cities (Malikyar/ 2015).

In the absence of adequate waste management services, people have begun to take action in a few municipal districts in 6 major cities, where the problem of waste collection is the most severe and where people are aware of the implications of improper waste management. Herat City is the pioneer for such a pilot one. While this is not a door to door collection but municipal workers collect the waste from fixed site regularly. In most places, this is in the form of door-to-door waste collection. There is no record on the number of such groups. Mazar-e-Sharif has also follow clean services.

4. Private sector

Recycling of waste in large amount is not common in Afghanistan. The private sector is mostly involved in purchasing inorganic waste such as cans, oil packs, plastic bottles and bones. Scavengers and scrap dealers buy or collect scrap materials and sell them to factories in Pakistan. The amount of recyclable robber and polyethylene that remain in waste indicates that recycling by the private sector can be only in plastic shoe factories.

5. Gaps and Challenges

5.1. Policy gap

NEPA with the technical support from UNEP, made efforts to develop the first Municipal Waste Management Regulation in 2010. A comprehensive consultation meetings and workshops were conducted. Due to absence of Kabul municipality, the regulation has been left in ministry of Justice for almost couple of year. In 2017, NEPA consulted IDLG to support the consultation to finalize the regulation. As mentioned earlier, NEPA, Independent Local Governance and recently established Capital Zone are supporting development of National Municipal Waste Management Policy. However, many municipalities lack the technical knowledge and financial resources for effective waste management. For instance, Kabul municipality has around 3000 sweepers and 180 trucks to manage waste generated by almost 3.7 million residents. There have been little efforts on the part of the government and citizens to address these problems. Even, when some municipalities have tried to find solutions on their own, the government has not provided necessary support. This is a perfect example of how the urban environment is not in the priority list of government. This has led to almost big gap and failures to implement its own policies of empowering local governments, involving the private sector in waste management, and maximizing recycling. Therefore, there is an urgent need for the government to enforce the policies and start implementing them in a planned manner.

NEPA has setup the first environmental penalty process to reduce the impacts of waste many urban services and activities. Similarly, a number of government regulations are also not synchronized with environmental policies. The scrap, sanitary and pollution taxes, which is charged by municipalities, on street cleaning, sanitation and collection for dumping, is a perfect example. This system has hurt the feelings of citizens and most of them does not willing to pay for.

The current municipal legislation for waste management, the Solid Waste Management and Resource Mobilization, is obsolete and needs to be changed. A new legislation on waste management, which clearly defines the responsibilities of various organizations, such as municipalities, NEPA, Ministry of Health, and other relevant stakeholders, and states the applicable standards and guidelines for effective waste management practices, should be enacted.

As per the environmental law, there was an urgent need to develop policies and legislation related to hazardous waste management. NEPA has clarified the responsibilities for managing various types of hazardous waste and issue guidelines for their handling, storage, transportation, treatment, and disposal. The first hazardous waste management regulation has been developed and handled to Ministry of Justice for process and approval.

Door to door collection by municipalities and communities have not yet started to take effective action. Composting, involving the private sector, and mobilizing public participation is still . The challenge is to replicate these efforts on a larger scale and coordinate efforts to solve the growing problem of waste management. More efforts are

required to create awareness among city dwellers at the local level about managing solid waste.

5.2. Information gap

Effective management of waste requires information on the amount of waste generated, characteristics of various types of waste, resources allocated for waste management, effectiveness of waste management systems, and impact of waste on human health, the environment, and the economy. This information is lacking. There should be a system for regularly collecting such information and storing it so that it is easily accessible, can be used for analysis for planning and management purposes, and can be disseminated to all stakeholders. At the municipal level, municipalities are responsible for collecting and managing this information, and at the national level, NEPA is responsible for collecting the information from all the municipalities and regularly monitoring their activities.

6. Recommendations

1. There is an urgent need to finalize and implement Solid Waste Management National Regulation, followed by policy implementation
2. Management and Resource Mobilization)
3. Strengthen the government defined hazardous waste and support the implementation of formulated policies, legislation, and guidelines for its management.
4. As organic waste is the main type of waste currently not being recycled, production of compost. Waste should be recognized as key economic development tools in urban areas by cities municipalities. It should be promoted.
5. The capacity of municipalities should be strengthened and upgrading municipal system is key to urban environment management.
6. The government should provide municipalities with technical and financial assistance for managing their waste.
7. As there is a significant gap in the information available on waste management issues, regular waste surveys and analysis of waste management practices in various cities should be conducted.

8. Way Forward

In order to implement the provisions of the Environment Law 2007, Government of Islamic Republic of Afghanistan has taken a number of policy and regulatory measures, namely:

- Interim regulation on Environmental Impact Assessment was introduced in 2008 to ensure the integration of the environmental concerns into sectoral development projects.
- National Environmental Action Plan, National Policy on Waste Management, and Clean Air Regulation were approved in 2009 to address the urban environmental problems.
- Regulation on Domestic Waste Management, Regulation on Biomedical Waste Management, and Regulation on Noise Pollution Control are already drafted and currently are in the approval process.

- Strategic Plan for Control of 15% of Air Pollutants by 1393 was brought on 2011 and implemented.
- National Ambient Air Quality Standard introduced in 2011.
- Recently Drinking Water Quality Standard, Noise Quality Standard, Standard for Discharges of Effluents to Surface Water and Land; Emission Standards for Industries; are approved by Supreme Standards Council
- Supreme Standards Council also approved the National Standards on Vehicular Mass Emission for Import of Vehicles into Afghanistan (as per EURO 3 and 4 standard) and also standards for fuel quality as per Euro standards are approved to address the vehicular pollution.
- Government has made a number of decisions to address the air pollution problem in Kabul, namely:
    - Ban on import of more than 10 years old vehicles
    - Ban on open burning of solid wastes
    - Ban on use of used tires and plastics in the brick kilns and other industrial facilities
    - Ban on the roadside generators
    - Use of LPG in public bath houses

9. Coordination and Cooperation in Implementation of Regulatory Measures

As per the provision of Clean Air Regulation, A High Level Commission on Air Pollution is constituted to provide policy guidance to NEPA and facilitate the implementation of action programs to deal with air pollution problem. Realizing the challenge of addressing the high level of air pollution in Kabul city, Council of Minister in May 2012 have constituted a high level Commission on Environmental Inspection headed by the Minister for Interiors with representative from twelve different ministries and institutions. In November 2012, the high level commission constituted the Executive Committee under the Chairmanship of DDG/Policy and International Affairs NEPA with authority to take action on non-complying industrial and commercial activities. The Executive Committee takes complaints from concerned citizens, makes observation tour of the city, mobilizes staffs to figure out the polluting activities, and agrees upon in the committee about the activities for sudden inspection. As such Inspection Plan is developed prior to making inspection. Sudden and Informed both type of inspection is practiced by this committee. Since November 2012, this executive committee is continuing the weekly inspection program primarily focusing to promote cleaner techniques/fuels and proper maintenance of fuel burning technologies in commercial facilities and highly polluting commercial vehicles. According to the latest database of NEPA, a total of 6157 commercial and industrial activities are monitored. Majority of these activities are in operation with improved techniques/practices/technologies and about 140 of them closed down. This is a very praiseworthy and exemplary initiation in the field of environmental protection in a developing country like Afghanistan.

The progress in Environmental Inspection and management

1. Environment management

Environmental Management Act of Afghanistan is key to environmental management in the country. This act followed by a number subsidiary regulations and policies.

1.1. Legal Framework and Policies

- Environmental Law (Gazette # 912/ 2007
- Wildlife Protection and Hunting Management Law (Finalized/ its in presidential office)
- Forest law (MAIL/NEPA 2014)
- Rangelands Law

1.2. Regulations

2. Control Ozone layer Depleting Substances Regulations
3. Environmental and Social Impact Assessment Regulation
4. Control of Air Pollution Regulations
5. Control and Protection of Water Quality
6. Control and Inspection of Noise Quality Regulation
7. Control and Inspection of Clinical Waste
8. Draft Protected Area System Regulation
9. Finalize Hazardous and POPs Waste Management Regulation

2. Policies and strategies

1. National Environmental Impact Assessment Policy (Social impacts integrated in 2017)
2. Waste Management Policy
3. Pollutions control policy and strategy
4. Review and upgrading environmental profile of Afghanistan
5. National Environmental Strategy
6. Strategy and plan of action of Natural Resource Management
7. National Strategy and Relevant Policies of Climate Change and Adaptation
8. National Protected Area System of Afghanistan
9. Air Pollution National Policy and Strategy
10. National Strategy for Biodiversity
11. National Strategy for Communication and Outreach
12. National Air Quality Management Strategy
13. National Strategy for Kabul Air Quality Management
14. Strategic plan for Environmental Protection (short-medium and Longt term)
15. Five Year Strategic Plan for Urban Air Quality
16. Emergency Response Plan for Urban Air pollution
17. Designated National Authority for Clean Development Mechanism (CDM) Projects in Afghanistan

18. Low Emission Development Strategies for Afghanistan
19. Framework for a comprehensive Climate Change Strategy – Draft
20. National Adaptation Plan of Action
21. Climate Change Country Profile
22. Initial National Communication for CC to UNFCCC
23. Intended Nationally Determined Contribution
24. GHG inventory
25. Develop Environmental Action Plan with the support of relevant Government Institutions
26. National Capacity Assessment and Plan for Environmental Management
27. National Self Assessment Plan of Action for Climate Change

Procedures

1. Procedures and ToR of High Commission for Air Quality Management
2. Procedures and ToR of Focal points
3. Procedures and ToR of Afghanistan Wildlife Executive Committee
4. Procedures and ToR of National Climate Change Committee
5. Interim Procedure for Protected Areas
6. Procedure and ToR Committee of Environmental Coordination
7. Procedure and ToR of Local Environmental Communication Councils
8. Procedures for Environmental Inspection (finalized)
9. Procedure for International Trade on Endangered Species of Fauna and Flora

Environmental Guidelines

1. Guideline for integration of Environmental Issues into national, and national government policies and document (drafted)
2. Guideline of municipal businesses and urban activities (drafted)
3. Guideline of Environmental Compliance for Crasher Companies in Afghanistan (Drafted)

Standards

1. Natioanl ambient Air Standards
2. National Standards of Water Quality
3. National Standards for Industrial Pollution and activities
4. National Standards for Vehicle Emissions
5. Noise Pollution Standards (Drafted)
6. Imported New Vehicles Standard (Drafted)
7. Manufacturing Emission Standards (drafted)
8. Develop Environmental Education Curriculum and integrated into Education Curriculum from 4-12th Grade
9.

Environmental Coordination

1. National Environmental Advocacy Council

2. National Advocacy Councils in 22 provinces
3. National Environmental Coordination Committee
4. High Commission for Air Pollution
5. High Commission for Environmental Management
6. Executive Environmental Group
7. EIA expert Group
8. Afghanistan Wildlife Executive Committee
9. Paris Agreement National Committee
10. Projects Steering Committees (6 Committees)
11. Steering Committee for POPs
12. Creation of Environmental Science Faculty in Kabul University
13. Creation of Environmental Departments in various faculties and Universities (public and private)

National Environmental Management Position

1. Member of Cabinet
2. Member of Ministerial Council
3. Member of Economic Committee of Ministerial Council
4. Member of Supreme Council of Standards
5. Member of Emergency Response Committee
6. Member of Supreme Council of Urban Development
7. Member of Supreme Council of Arazi and Water
8. Member of National Returnees Committee
9. Member of Executive Committee of Sustainable Development Goals
10. Member of inter-Ministerial Committee for Mines
11. Member of National Transport Committee
12. Member of Share Holders of Afghan Water Supply and Canalization Company

Part 6.

Ozone Layer Protection (Ozone Depletion Substances Unit)

1. General information

In terms of its obligation as signatory to Montreal Protocol and as the least developed country, Afghanistan has made its ultimate efforts to move forward to phase down Ozone Deleting Substances at the national level and assist to reduce the challenges at the regional and global level.

Afghanistan re-initiated the national ODS inventories which the reports have been submitted to the secretariat. The country is a special case in terms of its campaign to reduce import and use of ODS. The tasks are not to end by working with costume houses around formal borders and major cities, but to control illegal import from the secondary points and road. This is an extremely risky task. The plans for quota system and licensing has been going well during the years, and despite all challenges, the efforts for registration of importers have been success and most importers are now under control.

Afghanistan supported the proposed amendment with the consensus of all parties in 2016. The year 2017 has been the proposed time as the start for baseline date. With regards to Freeze date, Afghanistan support the ideas of 2025. On the phase-down schedule, it was preferred to adjust the schedule with careful coordination between non-Article 5 and Article 5 phase-down schedules.

Afghanistan initiated to incorporate *Ozone and climate change into its national strategy and action plan and working towards reducing HFCs under the Montreal Protocol.* Following ratification of Montreal Protocol, Afghanistan has made good progress in achieving the targets:

1. Implementation of first phase of Montreal Protocol and phaseout of CFCs. Holones, Carbon Tetra Chloride (CTC) in 2010
2. Reduction and prohibition of import of CFCs including R12 with the support of relevant organizations. This has resulted that Afghanistan receive the award of successful country in 2008,2009, 2011 and 2012
3. Under the 2nd stage of MP, works on gradual phase out of HCFC and prohibit the production and import of the said gases until 2040.
4. Training and capacity building of 866 custom officers
5. Training of 105 of law enforcement organizations
6. Training of 380 technicians
7. Distribution of 18 RTI
8. Distribution of 130 ODS recycling facilities machines
9. Training of 5 master trainer of refrigerators technicians
10. Reduction of 176 MT ODS
11. Prohibition of CFCs, Carbon Tetra Chloride , Haloons
12. Fixation of HCFC consumption in 2013
13. Public Awareness
14. Publish of 10 questions and 10 answers.
15. Initiation of ODS survey in 2016
16. Technical support for cooling system local industry
17. Establishing first Green Custom in Afghanistan
18. Capacity building of customs and government institutions
19. Capacity upgrade of Ozone unit team
20. Finalize ODS survey

Through a UNEP supported “Ozone Unit” in National Environmental Protection Agency-NEPA major achievements were possible in recent years by reducing used ozone-depleting substances. Chlorofluorocarbons, the most critical compounds under the ozone-depleting substances, where fully phased out in 2010.

2. Actual achievement for the course of reporting year

HPMP Launched on 31st January, 2012: The major achievement of the National Ozone Unit (NOU) in the year 2012 is launch of HCFCs Phase out Management Plan (HPMP).

Afghanistan's HPMP (**H**CFCs **P**hase-out **M**anagement **P**lan) stage 1 (2011-2020) was approved by the Multilateral Fund In May 2011and the inauguration session and stakeholders meeting was held on the 31st of January, 2012.

- **HCFC quota system established**

  As part of HCFCs Phase out Management Plan (HPMP) the NOU established the HCFC quota system.
  NOU issued quota to 5 ODS importing companies listed below:

  1. Rahim Khan Parsa 33 MT.
  2. Biradaran Hashimi Noman 41 MT.
  3. Iqbal Wali 17 MT.
  4. Omid Ali Musavir 14 MT.
  5. Jahan Sarmaish 5 MT.

3. Freeze consumption by January 2013

Afghanistan target to freeze the consumption of ODS at base line of 23.3 ODP tons (428 MT) by January 2013. NOU has achieved the target.

4. National Workshop for enforcement authorities held

National Workshop for the enforcement authorities. 50 officers from different stakeholders attended the workshop mainly from Ministry of Commerce, Afghanistan Custom Department, Border Police, AISA, ANSA.

5. Celebration of the International Ozone Day

16th of September has been declared as the International Ozone Day by UN General Assembly. NOU celebrated the day in a major ceremony held in Kabul, northern province of Balkh, eastern province of Nangarhar (major port of ODS import), western province of Herat (major port of ODS import), and other cities as per annual plan. The program not only strong country's commitment, but also is source of public and government awareness process.
NOU Has carried many other activities such as regular surveys of Air-condition and Refrigeration servicing workshops, inspection of these workshops, monitoring the importers of ODS and many more.

6. Details of the variance between planned target and actual achievements (if there is gap)

1. Total investment for achieving the indicator (if data is available)
2. National Ozone Unit had a budget of 90000 USD to achieve the above main targets.
3. Key challenges against achieving the indicated targets and recommendations

Next Steps

7. Specified targets for next 3 year

The targets for the National Ozone Unit are set by the UNEP Regional Office for Asia and Pacific OzonAction Program approved by the Government of the Islamic Republic of Afghanistan. The present Small Scale Funding Agreements (SSFA) had set the targets 2025. NOU will follow the targets set by UNEP Regional Office agreed upon by the Government of the Islamic Republic of Afghanistan for years to come

The Main Targets which were carried out as per the work plan of 2013 under HPMP are listed below:

8. HCFC Phase-out Policy and Enforcement.
   i. Formulated and strengthened licensing system and regulation;
   ii. Completed stakeholders workshops;
   iii. Completed workshops for enforcement officers;

9. Capability Certification system and good practice program for servicing workshops technicians
   i. Completed Train-the-trainers workshops;
   ii. Completed training program for RAC technicians;

10. Enhanced communication and outreach
   i. Completed research and analysis;
   ii. Completed communication strategy;
   iii. Completed stakeholder workshops;
   iv. Continuous media campaign;

Targets set under Institutional Strengthening (IS Phase V):

- Adoption/implementation of ODS legislation and regulation to control and monitor ODS consumption;
- Efficient and timely data collection and reporting;
- Consultations and coordination with other national agencies/stakeholders;
- Supervision of timely implementation of phase-out activities and reduction in ODS consumption;
- Awareness raising and information exchange; and
- Regional cooperation and participation to Montreal Protocol meetings.

Part 7

Traditional and Islamic Knowledge of environmental protection

1. Population and Environmental degradation

People are without doubt a valuable source in both, protection and the degradation of environment. Degradation of environment moves side by side with population needs and their struggles for survival. While protection requires strong policies and implementation power along with strong commitment at all level. Just if people is part of the problem, they are also part of the solution. The key to protecting the biological heritage lies in involvement of public, and their traditional knowledge in protection and faith.

Since Afghanistan is a country of geographical diversities and consists of different communities, it is obvious that all these communities have rich traditional knowledge which is a richest sources of definition of indigenous people. Moreover, the country is small, and consists of different multi-cultural, multi-lingual and multiethnic diversities. The traditional knowledge mentioned below is only a small fraction of the combined traditional knowledge of the communities. This is to learn about the traditional knowledge and methods to work with them. To enrich the context, there has to be a wide range of research on them.

2. Knowledge of Environmental Protection

There are good examples of environment protection in Afghanistan in its long history. Keeping in view the times of various emperors, kings and local authorities, environmental protection has undergone centuries ago. The articles and the stories in the country indicates the environmental panorama around 17th century that had no parallel in Europe. The country's natural resources especially forest and rangelands had been pinnacle. Local authorities had serious look to environmental issues. For instance, in Moghol period, Babur Shah were the one who always thinking for greenery and recharging rangelands and plant covers in very primitive and local methods. Deforestation and clear cutting was punished even to deceasing stages. Come across to sanitation, strict rules and regulation were in hand for garbage and rubbish collection. Pollution preventive measures were conveyed brain to brain. Even, horse riders were not allowed to ride fast in residential areas. There was a common behaviors among people to think for future generations. Trees were cut on selective manner. Coal was made only from the trees over hundred years at very sensitive styles not to pollute the air. Warming and heating had been limited to available resources in hand. Traditional water reservoirs, wise utilization of resources and limitation on resource uses were regulated.

However, like many other countries in the world, Afghanistan had always been attracted the interest of others. The ancient history of the country explains the story of silk rout and the leading army of Great Sikandar of Greek to India through Afghanistan that had left both the positive and negative effects on the environment. From one hand if they left negative impacts by degradation of their rout forest, plants, and other natural resources, the ethnic group of soldiers remained in Afghanistan left a positive impact on the

environment because of their culture of regeneration and protection the flora and fauna including wildlife.

2.1 Traditional Knowledge

Traditional knowledge within the community identifies many protective ways for the environment and natural resource in the country. This knowledge comes in the form of stories, fictions and appreciations. The examples of protection in the form of stories are common. It is rather an informal education from the parents to children[19]. Telling the outcome of aggressive who ruthlessly cut the trees, or vegetation covers from the top and hillside receive rage and punishment from ALLAH Almighty is a common knowledge. One of the main stories that most of elders and children remember throughout the country" is flood flow in a rural mountainous areas because of over exploitation. Such stories are main preventive knowledge of people inherited generation to generation.

Prohibition of hunting, egg collection, and trapping during breading seasons is very ancient tradition among local people. They believe this will cause God Almighty's rage. This story conveys brain to brain and generation to generations that offenders are stroke by God. Very small incentive can keep them aside to prevent disturbance and habitat destruction.

2.2. Traditional Knowledge of Wetlands Protection/conservation

Afghanistan is a subtropics where water resources is scarce and most of the areas classified as arid and semi-arid, located in two transitional zones of Palearctic and the oriental. It has a diversity of wetland ecosystems. 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, biologically productive ecosystems that are considered to be of international importance for migrating and wintering water birds. Lack of adequate management of water resources along with competition for scare water resources has led to the degradation of water quality, loss of natural habitats and subsequent elimination of wildlife and fauna species. Wetlands conservation will be included as part of establishment of protected parks.

Wetlands are one of the most productive ecosystems in the country. There are two type wetlands ownership. (i) Government property; (ii) communal property. Non or very less private ownership is existed. The wetlands extend all over the country with large and small sizes. People have considerable knowledge for wetlands:

- Possible site as market hunting and trapping which provides many local people with a livelihood
- Main sources for reed and other hydrophytes, and
- Places to convert for agricultural purposes.

Local people conserve wetlands as water reservoir. They believe that where there is reed-bed it would keep water for long. They will then use the water for irrigation and other purpose. Traditionally, the community does not cut the reeds during breeding of ducks and other waterfowls. Only small children collect eggs for fun. But most of them prohibited by elders. The importance of seasonal wetlands are not feeling much. Making drainage and conversion to agricultural lands and housing is normal.

[19] Such stories have left positive impact to the brains of children religiously.

2.3. Technical Knowledge

The question of how natural resources and environment come under pressure in the long history of Afghanistan has been lack of support to traditional institutions and the absence of modern institutions is still on board. While traditional institutions for the management of environment was weak the new ones have also not been effective. Universities and education system's curriculum is still weak and offer low capacity. Basic environmental services and the existing institutions left with name and a few disqualified staffs. Few specialized agencies have been created by the government and civil societies in the last few years but little interventions has occurred that could qualify them as service oriental agencies. The contribution of private sector in environment management is regrettably naught. Few international organizations and national organizations are active, mainly in the field natural resource management, but local expertise is limited to a few. The most striking feature of the environment from the knowledge point of view is that the capacity is extremely low and much efforts is needed.

2.4. Knowledge of Water Resource Protection

This is the most ancient and Islamic knowledge among people. Protection of water resource and wise utilization has been very common. Water harvesting and creation of water reservoirs has special place in the society. Surplus water from irrigation and other purposes are being kept in the form of ponds and depth holes. Specifically, the styles for protection of drinking water from contamination and pollution has been in very effective measures.

"ISLAM SHARIA" offers an extensive guidance for utilization of water for all purposes. Water for washing, drinking, abolition, body wash etc should be clean. There are many verses in Holly Quraan in respect to water utilization.

Traditionally, water resource utilization and wise use knowledge was essential lessons in the very childhood which is partially neglected during the war. Prior to installation of hand pumps for drinking water, communal wheels played key role in water conservation. Communal wheels were supplied with traditional water output equipment and covering system. Only elders have been able to withdraw water. Well water conservancy system was extremely effective. It was managed out of reaching the children. Establishing a wooden or concrete water reservoirs for surplus water was well managed beside with an outlet. Least water was spoiled. These reservoirs were main sources for animal drinking. At the meantime, one of the substantial advantage of such water utilization is supplying water for the consumption of household only. Sense of water recharge was a common feature especially at the time of low water table. The village elder or leader announcing low water table and range for recharging. In these period they used to bring water as much as severely needed. Water withdraw spacing was highly considered.

During the past years and near recently, the indiscriminate use of tubewells in rural areas, scattered drilling of deep and shall wells with hand pumps and water pumps in urban areas have created serious problems. Owners of orchards and farms typically sink tubewells, run them round the clock on electricity or diesel at a flat rate, and irrigate their

orchards to produce fruits worth thousands of Afghanis. What the users have failed to understand, however, is that groundwater is a infinite resource. Their actions have led to a decline in the level of groundwater in many places and an acute shortage of water, even for drinking purposes. This ominous scenario is gradually unfolding throughout the country.

KARIZE (underground water canal) is traditionally a very effective source of water. It serves as a major source of irrigation and drinking water in arid areas. These are usually constructed on a communal basis, yield up to 200 liters/second and serve a maximum of 200 shareholding families. Each share in a Karez represents the amount of time that water is available for irrigation purposes. These shares may, in turn, be rented out and are often fragmented into very small units. The nature of the karez system helped create particular societal relationships and socio-economic conditions in the villages they served. Unfortunately, with the sophisticated machineries, and sink up dug wells this tradition source is outmoded.

Drying up of karizes due to the installation of tubewells and dugwells, lack of maintenance and droughts in the country put all users in critical pressure. Misuse of water and lack of coordination and research in the country is also a problem. Lack of water board, planning and management in the government sector of water basins which is useful step towards sustainable use of ground water and an efficient irrigation system is an other major question.

2.5. Knowledge Carriers

Generally, the carriers are elders of the community. Most of the elders like to explain his/her life carriers to youngest and children. Religious leaders, tribal elders, members of Jergas, teachers and people commending respect in society are the immediate guide in the issue. They mostly conveys the messages through gathering places. The only gathering place and time to this group is summer evening in traditional lawn or green areas and winters in mosques and sunshine. It is somehow informal networking between the communities. *For instance, the author remember when one of the village elder was expressing his experience from the local government rules and regulation on promotion of community forestry program through participatory approach (Hashar work) who forced people to plant trees and protect greenery in the villages*. Such knowledge has often been in the memories and moves forward. Knowledge barriers are:

- Elders and religious scholars
- children to children in the form of short stories and drama
- visitors of other districts or provinces
- school teachers
- extension workers in the time of stability
- stories and fictions

2.6. Hashar (Labor Exchange)

Hashar is an Arabic word meaning exchanging labor. It is a regional level TK of the indigenous community. In this system, people form a group and work for each other without paying money. Since it is hard for one man to work in own field, people form a group for this purpose. This group of people works on the field of one of the members of

the group whenever necessary. If there is a need to work on the field of another member of the group, they again work for that person. Simultaneously, this group of people works on each and every field of the members of the group without receiving or paying. This tradition is called ‘Hashar’ or the exchange of labour. Here, no cost is incurred and people get a lot of benefit from it.

2.7. Threats to Traditional Knowledge

Although the traditional knowledge of the Indigenous Peoples has been found to be very useful and effective, it has still been neglected by many means. There are many threats like environment, urbanization, globalization etc. to traditional knowledge, some of which are mentioned below:

- migration and displacement by natural and manmade disasters leave an adverse effects on the traditional knowledge. This has been a big gap in Afghanistan.

- Climate change or Global Warming is one of the major threats on the Traditional Knowledge of the communities. This has led to the displacement of the communities from their places and made difficult to pass down the traditional knowledge.

- Urbanization also poses threats on Indigenous peoples’ traditional knowledge. It has occupied the territory of these communities which, in turn, has displaced them. A first hand example in Kabul is development of urban areas to Chardehee area which has left negative impacts on the tradition of communities.

- The contradiction between the national policy, constitution and legislation with customary laws of the Indigenous peoples is also seen as one of the major threats.

- Negotiations for access to global market has posed a threat on TK of the indigenous communities as the government’s negotiations has neglected specific needs of the indigenous peoples to protect traditional farming systems.

- It is believed that future plans for national parks or wildlife reserves that would be established by the government without the involvement of the indigenous peoples can also be one of the major threats. The establishment of these parks or reserves will lead to the occupation of the territories of these communities and has resulted in the loss of Traditional Knowledge.

- Loss of Indigenous languages is also a threat on TK since the traditional knowledge of the communities is passed down orally.

- Loss or disappearance of traditional knowledge, particularly from indigenous peoples, is rapidly occurring due to the encroachment (intrusion) of state and market forces and the decease of elders carrying that knowledge. Once lost, orally based knowledge cannot be retrieved.

3. Ways of integration of traditional knowledge into modern env. Knowledge

Raising public awareness in environmental issues in a country with almost 92% illiteracy rates is a formidable challenge. With such illiteracy rate, inadequate road network, multilingual population and a dominant rural tribal social set-up, getting the messages across is not an easy task. Traditional channels such as newspapers, have non or limited readership and penetration. Coverage issues such as environment on Television which can be popular but is inadequate. A vast majority of the population owns radio sets but the duration of the local transmission in not even sufficient to provide entertainment. Public libraries are limited, and literature on the environment is not existed yet except small works by the NGOs. The public is not in the habit to visit libraries. These limitation has kept the population of regular and update knowledge in environment.

In a traditional society like Afghanistan informal channels of communication is more important than the formal ones. In this regard understanding the rural sociology, psychology and traditional knowledge play key role in implementation of environmental awareness.

4. Role of Islam in Protection of Environment

People's priorities and therefore perception of "environment" depend to a large extent of their situation along the path of development from poverty to affluence. For the majority of people in the developing world, degradation of environment is seen and felt in terms of the struggle to meet their basic needs at the household and community levels.

In Afghanistan for most of the population environment is a matter of choice, their views of the environment is Allah given gift to use it. While, understanding the environment in the spirit of HOLY QURAAN is that! Allah Almighty has given us all good things free and in abundance and one would not be able to count them if he intends to do so. If we are grateful to Allah, Allah Almighty will add more for us, and if we show ingratitude, the consequences will be dreadful indeed. In all these things there are sings of "Allah Almighty's Hekmat" for those who consider and look into them with true spirit of faith and reverence. All these things have not come up by "mere chance" but have been created with a definite purpose and are protected and regulated in just measure and proportion, and there are indeed Allah Almighty revelations which lead us from darkness (ZULMAT) toward light (NOOR) and Allah is so gracious that has given us all that we have asked for. Wise utilization of resources is one of the main orders in Islam.

Key solutions to challenges include:

- Strive to end conflicts and stabilize population movements.
- Strengthen governance of natural resources with enhanced participation of local communities.
- Implement the Paris agreement and strengthen Nationally Determined Contributions before 2020.
- Address air pollution and reduce greenhouse emissions that contribute to climate change.

- Reduce fossil fuel subsidies in every region (a G7 commitment), which can accelerate deployment of renewable energy technologies, improving human health, access to modern energy services, and potentially reducing the long term threat of climate change.
- Incentivize behavioral change through tax policy and public awareness campaigns.
- Enact policies that reduce consumption of natural resources and identify solutions that promote conservation, reuse, and recycling. (New food waste reduction strategies in the US and the EU are examples of this.)
- Implement new water conservation and harvesting strategies that respond to the changes in glacier/mountain regions that will protect fragile ecosystems and maintain hydrological balances.
- Commit to zero deforestation (as proposed in the Sustainable Development Goals) as soon as possible particularly critical in Southeast Asia, Latin America, and the Congo Basin in Africa.
- Adopt new management practices for handling and reusing municipal solid waste, which poses a threat to water quality and human health in many urban areas
- Invest in urban and coastal flood control systems to improve resilience to climate change.
- Intensify and expand local, national, regional, and global cooperation on environmental information, trends, response measures, and best practices. And ensure public participation through awareness raising, media outreach, and education

Technical Partners and implementing partners

- United Nations Environment/Afghanistan Program
- Asian Development Bank
- World Bank
- United Nations Development Program
- United Nations Food and Agriculture Organization
- European Union
- Wildlife Conservation Society/Afghanistan Program
- GIZ
- Multilateral Environmental Agreement
- National and International NGOs

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