Natural Environment and Biodiversity

- **Conservation of Biodiversity**

The Government of Iran recognizes the importance of biodiversity conservation and in collaboration with UNEP and national stakeholders is updating the framework of "National Biodiversity Strategy and Action Plans" (NBSAPs) for over the next decade.

Biodiversity or biological diversity is the variety life on earth. CBD defines "Biological Diversity" as the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.

Biodiversity provides us:

Life-sustaining Capacity:

Ecosystems provide us the ecological services such as photosynthesis capability, oxygen production, water purification, climate regulation, soil fertility and removal of greenhouse gases from the atmosphere.

Health services:

Gene pool of species provides substances that offer us significant health benefits.

Humanity provision:

The diversity of life forms provides us job security. The employment in different sectors such as: agriculture, fishing, forestry and eco-tourism. Forestry, fishing, agriculture and ranching industry rely on healthy ecosystems and natural processes for their continued viability.

Community health and well-being:

Many communities secure livelihoods and life sustaining capacity on the surrounding of ecological resources including fish, timber, wildlife and agriculture. The future of these communities is directly tied to the sustainable use of biological resources and to the health of the ecosystems of which these resources are a part.

Spiritual values:

The diversity of ecosystems and species is a source of emotion and spiritual inspiration for cultural identity and diversity.

Future perspectives:

Maintaining biodiversity means enhancing resilience capacity for responding to unforeseen and ever changing environmental conditions, like climate change. Create opportunity for discoveries in different industrial sectors. Failing to conserve biodiversity puts pressure on future generations to cope with their lives.

Hence, biodiversity provides the fundamental building blocks for essential goods and services that maintain our personal and social wellbeing.

However, despite efforts to manage threats and pressures to biodiversity, over the past few decades, Iran observes a great lose in biodiversity. The main threats to Iran's biodiversity are:

- Fragmentation and degradation of habitats;
- Spread of invasive species;
- Unsustainable use of biodiversity and overexploitation of natural resources;
- climate change;
- Deforestation and desertification;
- Intrusion of domestic animals to wildlife territory and vice versa;
- Construction of dams and water flow change; and
- Unsustainable agricultural practices

Some current activities in Iran include:

- Conservation of biodiversity through preparation of "Conservation Action Plan" for 30 threatened species;
- Contribution to the "National Development Five Years Plan"(NDFYP) and inclusion of major biodiversity challenges and issue into the NDFYP;
- Continue activities within GEF projects on threatened species and ecosystems like; Cheetah, Zagros, Wetlands;
- Updating comprehensive conservation plan for Crocodiles in the Gando protected area;
- Preparing the study scheme on Talesh toads, as the largest toad species in Iran;
- Preparing the study scheme for mountain salamander in Kurdistan;
- Supervising the preparation of reptiles, amphibians, birds, mammals and inland water biodiversity encyclopedia;
- Supervising the monitoring scheme for reptiles and amphibians at the national level;
- Establishing joint research programs with universities and research institutes on important species of reptiles and amphibians;
- Considering ecotourism program on ecologically reptile and amphibian rich protected areas;
- Creating information bank on species mortality, especially databank of traffic fatalities on reptiles and amphibians and other species road fatalities in order to integrate the comprehensive conservation program;
- Reviewing the programs on environmental documentaries;
- Planning to work with volunteers in conservation study;

- Organizing and equipping the several breeding centers (in progress);
- Developing the capturing system for Onager (in progress);
- Annual mammals, reptiles, amphibian and bird census; and
- Developing guidelines for reducing human-wildlife conflict (in progress);

However, the strategy for the population recovery and management of the Persian fallow deer has been developed.

- **Conservation of Trans-boundary Wetlands and Water Bodies:**

Efforts on establishment of several joint wetland sites with neighbor countries like; Turkmenistan, Azerbaijan, Pakistan, Iraq has been developed.

- **Preservation and Management of Water resources:**

Considering the present global population growth, water demand increases by 64 billion m3 each year. Water demands are becoming increasingly high in areas such as agriculture, economic development and energy production. Moreover, the disturbances induced by climate change have immense impact on the hydrological cycle. The report from Intergovernmental Panel on Climate Change (IPCC) indicates in many regions of the world, we may expect longer droughts and more frequent floods. Such disturbances further aggravate the degradation of ecosystems, which already facing growing anthropogenic pressures.

From the health point of view, 80% of the diseases affecting developing countries are waterborne and water-related diseases. This is due to insufficient access to drinking water and lack of sanitation infrastructures, owing to both poor funding and poor political and strategic decisions. This alarming water situation is further stresses by biodiversity lose due to pollution, degradation and overexploitation. In such situation, it is more than ever important to control as completely as possible our water resources, in order to mainstream inland aquatic diversity including migratory birds. It is therefore necessary to be able to monitor and evaluate our national water resources. In this regard Iran with technical and financial assistance of Japan International Cooperation Agency (JICA) have got comprehensive program for national inland water resources conservation.

- **Conducting Joint Studies on Wildlife Migration Patterns, Mortality Rates, and Contagious Diseases and International Trade**

Migration pattern:

Animal migrations are among the world's most tangible and inspiring natural phenomena. Although animal migration may be a cyclical natural phenomenon, it is also a massive

exposure to risks and dangers. In virtually every part of the globe, migratory animals encounter a growing array of threats, including habitat destruction, poaching, overexploitation, disease, and global climate change. Saving the migratory routes would be one of the most ambitious challenges of the 21st century. However, if we fail to do so, aesthetically, ecologically, and economically, we will pay a heavy price for it.

In Iran the threats facing migratory species are not qualitatively different from those confronting non-migratory species. But migratory animals more vulnerable by virtue of the long distances they travel. Their populations can be harmed not only by the loss of breeding habitat but also by changes in their wintering grounds and stopover sites and moreover illegal hunting and poaching in practically every resting stations.

Moreover, many migratory animals aggregate at key places during certain times of the year, a habit that makes them vulnerable to overexploitation, where the rule of law compromising. For example, all of the world's sea turtles are imperiled in part because adult females return year after year to the same beaches to lay their eggs; the slow-moving and defenseless turtles and their eggs are easily harvested at their nesting beaches. Climate change also, has the potential to disrupt the migratory patterns for a wide range of animals. Rising sea levels could submerge the nesting beaches of sea turtles and shore-birds.

The decline of the world's great animal migrations is clearly a major aesthetic loss. But it is also a major environmental and economic problem, given the important ecosystem services these species provide to humanity.

Given the strong aesthetic, environmental, and economic judgment for protecting animal migrations and their temporarily settlement, following question comes in mind:

Why we are so naïve and unsuccessful in protecting the migratory species lives? The answer may lie in the fact that conserving migratory animals poses two unique challenges. First, it demands coordinated planning across borders and boundaries and second is the protection of these animals while they are still abundant.

However, the establishment of early-warning system will increase our capacity to identify how migration may be at risk and how to mitigate the identified risks on species before and after their settlement.

If we successfully save the world's great animal migrations in Iran, we will have conservation connectivity that provides us with numerous ecosystem benefits. By doing so, we will ensure our future generations to enjoy some of the same flocks of birds, schools of fish, and herds of mammals that have inspired and sustained us and our ancestors for thousands of years. However the following program is on progress:

- Identifying migratory routes of Onager (*Equus onager*) in Bahramgoor protected area by satellite telemetry, getting implemented in collaboration by Esfahan University of Technology, Research Institute of Wildlife Ecology, University of Veterinary Medicine and DOE (a sustained program);

Wildlife diseases:

Diseases that officially recorded in Iran's wildlife include:

1. Peste des Petits Ruminants (PPR):

In drought condition and climate change the possibility of disease is more. PPR in the following provinces in the year 2015 was reported:

- Markazi province (Haftad Ghaleh area), more frequently in wild goats, ram and ewe;
- Alborz province (Talaghan area), seen in wild goats;
- Zanjan province (Taram area), seen in wild goats;
- Ghazvin province (Alamut area), seen in wild goats;
- Tehran province (Khajir area), seen in wild goats;
- Zanjan province (Sorkh Abad-Sarayen), seen in gazelles; and
- Fars province (Bavanat area), seen in wild goats

2- Rabies:

In most parts of the country, especially the western provinces and especially in Khorasan Razavi province through wild canines have been reported, but more than 80 percent of rabies has been caused by the mad dogs attack.

3- Highly Pathogenic Avian Influenza (HPAI):

In 2005 for the first time was reported in swans in the Anzali port area in the north of Iran and from then, there was no other official report.

4- Tick:

Tick (seen in Tandooreh-Kolah Ghazi-Dashte Naz National Park) and some parasitic diseases such as Myiasis seen in Khuzestan province in fallow deer species

5- Entertoxemia:

Enterotoxemia in spring season in some areas seen in wild herbivores

6- FOOD AND MOUTH DISEASE (FMD):

In the year 2016 seen in wild goats (total 7) in Khorasan Razavi province

7- Paramyxo virus-type 2:

In terrestrial birds, for the year 2014 seen in Hormozgan province

Diseases that are not officially reported by the Veterinaries and up to now by sampling also not been confirmed, but may be present in the wild life include:

1- Botulism:

The death of birds that feed on the stagnant waters, since the water level is dangerously decreasing due to the continuing drought conditions and unsustainable use of water resources

2- Tularemia:

In rabbits

3- Ectima contagious

4- Crimean Congo Fever

International trade:

The global trade enhanced prosperity and benefits to societies around the world, much of which would be impossible without the exchange of goods, including food crops, fish and livestock products, raw materials, manufactured items, etc. The negotiation of multilateral and regional trade agreements including, the World Trade Agreements (WTA) in 1994, reflect a consistent effort by countries to expand and facilitate international trade across national borders. However, the movement of goods through such trade has provided pathways for invasive alien species to spread and colonize new areas. The transfer of these species is often unintentional, but too many times they have been intentionally transported by the hand of humanity. These invasive alien species can have an exceedingly broad range of economic, environmental and social impacts. Ecologically, Invasive Alien Species (IAS) and habitat destruction are the top two threats to the survival of endangered species.

- **Restriction on the Introduction of Alien Fauna and Flora**

Invasive Alien Species (IAS) are plants, animals and pathogens introduced outside of their natural range and whose establishment and spread can adversely impact other species, habitats and ecosystems. These invasions state one of the most significant, international threats to our biodiversity, human health, livelihoods, local cultures and national economies. Most countries now face threats from non-native species and are struggling to prevent the influx of more invasive species as the global economy expands and the movement of goods, services and people continues to grow. Unfortunately, scientific knowledge and institutional mechanisms are currently insufficient to effectively predict, prevent or mitigate the impacts of invasive species.

Iran has experienced a number of biological invasions, some of which had significant consequences on socio-economic status. Notable example includes the water hyacinth (*Eichhornia crassipes*) in our national water bodies.

- Sustainable Development of Ecotourism

  Strengthening the conservation cooperation with other neighboring countries and institutes for the management of the threatened species such as: the Birds of Prey, Houbara (*Chlamydotis undulate*), Lesser White-fronted Goose, White-headed Duck, etc.

- **Major Ongoing & Fresh Environmental Projects:**

  - Implementing an integrated conservation roadmap to the native cat species in Iran;
  - Designing a workshop on new methods for updating ungulate status;
  - Searching new methods for Red deer (*Cervus elaphus*) censes in the North of Iran;
  - Finding new conservation approach for Roe deer (*Capreolus capreolus); and*
  - Searching on Sand Cat migratory routes and its distribution (a continuing project)

  - **Difficulties Encountered:**

- Habitat degradation and fragmentation and isolation of the populations ;
- Destruction of habitats by chemical wastes, agricultural debris, urban and industrial pollutions;
- Unregulated and illegal introduction of alien species into protected areas;
- Illegal hunting and poaching;
- Exceeded number of livestock in the rangelands;
- Lack of wildlife databank;
- Overgrazing of domestic cattle within protected areas,
- Illegal trade of wildlife;
- Lack of equipment, human resources and their capacities;
- Climate change;
- Wildlife diseases (reported and unconfirmed); and
- Weaknesses in law enforcement

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