MINISTRY OF NATURE PROTECTION OF TURKMENISTAN

GLOBAL ENVIRONMENT FACILITY

CONVENTION ON BIOLOGICAL DIVERSITY

UNITED NATIONS DEVELOPMENT PROGRAMME IN TURKMENISTAN

TURKMENISTAN

FOURTH NATIONAL REPORT
ON IMPLEMENTATION OF THE UN CONVENTION
ON BIOLOGICAL DIVERSITY
AT NATIONAL LEVEL

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EXECUTIVE SUMMARY

The territory of Turkmenistan (49,1 million ha) is located in the heart of the Asian continent and is a part of Turan climatic province and is extreme northern area of continental subtropical climates of the Central Asia. In the north the country borders on the Republic of Kazakhstan, in the east and the northeast – Uzbekistan, the south – Iran and the southeast - Afghanistan. Major part of the country (80%) is occupied by the deserts - Karakum (35 million ha), Sundukli with adjoining low mountains (2,8 million ha) and Near-Caspian deserts. Along the border with Iran the mountains of Kopetdag-Horasan mountain province are located, on the border with Uzbekistan – Koytendag of Pamiro-Altay mountain system, on the border with Afghanistan – Badhyz hilly mountains as northern part of Parapamiz foothills. The contrast of natural and geographic conditions has defined the range of altitude fluctuations, from -92 m (Archakay depression) to 3 139 m (peak of Turkmenbashi, or Ayrybaba mountain, Koytendag range). Feature specificity of natural conditions of Turkmenistan includes considerable duration of solar light, maximum total index of solar radiation, high heating of the air (above 50˚C in the shadow) and soil, sharp continentality and extreme degree of climate aridity.

According to the World Wildlife Fund (WWF), the territory is in limits of one of the 200 global environmental regions in borders of which the two global flashpoints of biological and genetic diversity are located – Kopetdag-Horasan (Kopetdag) and Central Asian (Koytendag) mountains, at a wide range of natural ecosystems. The key role of Turkmenistan in the world consists in preservation of unique mass of natural ecosystems that provide functioning of biosphere as a whole, where the biodiversity acts as the most valuable component of national property and a leading strategic resource of the country.

International agreements. Our country has joined the nature protection conventions of the United Nations which are on a global scale the guarantor of preservation of environment and the prevention of environmental catastrophes, thus having confirmed the readiness to solve issues of the national biodiversity at the international level. Among them, the Framework Convention on Climate Change (1995) and Kioto Protocol (1998), the Convention on Biodiversity (1996) and Cartagena Protocol (2008), the Viennese Convention on Protection of Ozone Layer (1993) and the Montreal Protocol on the Substances Destroying Ozone Layer (1993) and its amendments (1994, 2008), the Convention to Combat Desertification (1996) and the Basel Convention on the Control over trans-boundary transportation of hazardous wastes and their removal (1996), the Aarchus Convention on Access to the information, participation of the public in decision-making process and access to justice on the questions, concerning environment (1999), the Framework (Teheran) Convention on Protection of the Marine Environment of the Caspian sea (2006), the Sub-regional Framework (Ashkhabad) Convention on Preservation of the Environment for sustainable development of the Central Asia (2006), the Ramsar Convention on Wetlands of International Value (2009). As the Convention component on preservation of migrating kinds of wild animals Turkmenistan has signed «the Memorandum of mutual understanding on preservation, recruitment and sustainable use of a saiga *(Saiga tatarica tatarica*)», «the Memorandum of mutual understanding on preservation of white crane (*Grus leucogeranus*)» and «the Memorandum of mutual understanding concerning preservation and recruitment of a red deer (*Cervus elaphus bactrianus*)».

The problem of biodiversity conservation passes through all articles of the Convention on Biodiversity (CBD), also preserving priority in the Convention on Desertification (Article 6 of Appendix 4) and in the Framework Convention on Climate Change (Article 4),

permitting the country protecting, to use its genetic resources. Turkmenistan, being a party of CBD, automatically became the participant of the FAO International Agreement ob vegetable genetic resources for manufacture of the foodstuffs and agriculture management (2007), though for today this Agreement is not signed by any of the Central Asian countries. Turkmenistan is the Party of Regional Strategy on preservation, replenishment and use of genetic resources of plants for the foodstuffs and agriculture in the Central Asia and Trans-Caucasus for the period till 2015 (2007). For the countries of the Central-Asian region it is strategically important to have the interstate agreement on preservation of local/age-old grades of fruit crops and their wild-growing relatives – a natural genetic fund of maintenance of sustainable development of fruit growing.

Turkmenistan, having signed in 1995 the Declaration on prolongation of membership in the Convention of the World Organization of Intellectual Property (WOIP), supports CP-9 decision of CBD (19-30.05.2008) about the importance of the Global Action Plan of FAO in the field of preservation of genetic resources of animals for foodstuffs manufacture. For making a bridge between the user and the owner of genetic resources, it is important for the country to enter the process of bio-diplomacy and to become a Party of Bonn Guiding Principles - the access mechanism to genetic resources and distribution of benefits that will promote protection of food independence of the country.

The problem of reduction of biodiversity has been incorporated into «the National Environment Protection Action Plan of the President of Turkmenistan (NEAP) and is partially considered in the National Action Program to combat desertification, and at the level of forms of adaptation of biodiversity – in the Second national FCCC report (2006-2009). The cross assessment of capacity of the three international conventions (CBD, CCD and FCCC) has allowed the country not only to increase cooperation between them, but also to define resources of maintenance and increase of resistibility of biodiversity components to climatic changes (Potential Assessment … Thematic reports, 2006).

The program document has been developed for improvement of environmental conditions in near-Caspian region of Turkmenistan within the frame of the Caspian environmental program (CEP) - the National Caspian Action Plan (NCAP, 2008) as a basis for coordination of actions for solution of national and trans-boundary environmental problems of the Caspian sea; trans-boundary CEP diagnostic analysis (2007) has been carried out. The leading part in NCAP formation and execution consists in acceptance of measures on urgent regulation of adverse influence on the Caspian sea deep-water ecosystems and species in these areas.

Supporting adopted international conventions, Turkmenistan strives for full-scale implementation of sequential decisions and obligations. Within the scope of CBD implementation, International Workshop on preservation of biodiversity of the Central Asia (1999), National seminar of foresters (2000) and a number of working meetings have been held, such as those related to carrying out of scientific research in the reserves, establishment of first national parks (2006-2008) and preparation of the Second Edition of the Red Data Book of Turkmenistan (1998), etc. At the regional seminar of the Central Asia countries on problems of climate change in the region (Ashgabat, 2008), among others the issues of the biodiversity preservation have also been considered.

The world community has highly appreciated these positive efforts of our country that has found reflection in the decisions adopted by the Interstate Sustainable Development Commission (ISDC) for the countries of Central Asia. In November 2006 the Framework Convention on Environment for Sustainable Development of Central Asia» has been signed, as the integrated environmental strategy. Establishment of common legislative platform will promote to generate additional priorities, to define prospects of the further regional cooperation of the Central Asian countries on implementation of tasks of preservation and

sustainable management of biological diversity resources. Assessment Report on priority environmental problems of Central Asia (2006) and the Integrated Assessment of environment conditions of the Central Asia (2007) have been published. Scientific Information Center (SIC) ISDC provides to the Interstate Commission with information and expert support on implementation of the Regional Action Plan on preservation of the Centrak Asia environment. On 10.03.2009, the Ministry of Nature Protection of Turkmenistan (MNP) and the Ministry of Environment, Nature Protection and Nuclear Safety of Germany have signed the Declaration on intention of cooperation in the field of preservation of the environment of Turkmenistan.

Biodiversity. Studying of biodiversity of Turkmenistan is closely connected with various aspects of preservation of species, habitats and landscapes which as a result define environment key parameters. The understanding of this is clearly reflected in the National policy of Turkmenistan on its way of harmonization of our society, adequately reflecting the global Agenda of the XXI century in *«The Strategy of Social and Economic Reforms in Turkmenistan for the period till 2010»*. Preservation and maintenance of the national biodiversity is distinguished as the important criterion of its sustainable development.

The problem of decrease of biodiversity is included in the NEAP (2002), legislatively approved by the government of the country. The Protocol on Biodiversity to the Frame Convention on protection of marine environment of the Caspian sea is being developed. From 2002 to 2010, the Biodiversity Strategy and Action Plan (BSAP) is enabled in the country. The "*Third National Report on Implementation of the UN Convention on Biological Diversity"* (2006) is presented to the Convention Secretariat and is available at its site http://www.biodiv.org/world/map.aspx?ctr=tm

The biological diversity of Turkmenistan is 3140 higher and 3924 lower plants species; about 13 thousand species of animals, including 683 vertebrates (the state of biological variety of Turkmenistan, 2002). The biodiversity is characterized by high indicators of indigenous development of flora and fauna on the background of morphological-systematic and reproductive features of species forming them. The assessment of risk through disappearance of biodiversity of Turkmenistan on species, sub-species and population levels is presented in the Red Data Book of Turkmenistan (1999). Recognizing biological variety as stabilizing factor of ecosystems sustainability, its national value should be considered at the global importance level.

Mountain ecosystems of Kopetdag, Koytendag and Badhyz are the "hotspots" of concentration of the biodiversity, the key role of which, on the one hand, is connected with the center of the origin of cultural organisms, from the other - the naturally isolated refuges of the most ancient biological and cultural-historical relicts. In the mountains and foothills there are 2/3 of all species of terrestrial vertebrates biodiversity of the country. The major part of territory (80 %) is occupied by arid ecosystems of such large landscape plots, as barchans and barchan-sand dunes, takyrs and takyr-type soils, saline soils and clay badland.

On ecosystem level specific actions for preservation of globally threatened species *(Asian Near East leopard, goitered gazelle, Turkmen koulan, red deer, Caspian seal, Central Asian cobra and lebetina viper*) at places of their inhabitance are implemented. The basic tendencies of threat factors development *(biodiversity decrease, reduction of habitats of various species of flora and fauna, alien species invasions are defined; excessive consumption of natural resources, environmentally dangerous exploration and production of oil and natural gas, global climate change),* threatening the national biodiversity (section 1.2) have been identified.

The forest fund of the country is presented by natural mountain (juniper, pistachio), tugai and desert (saxaul) forests, which occupy 20,3 % of the country's total area. The largest areas are occupied by sand-desert (9351 thousand ha) and tugai (44,5 thousand ha) forests. Artificial woods (36,4 thousand ha) provide forestation of deserted territories and mountain foresting. The main owner of genetic plant resources (GPR) is the state, independently whether they grow in specially protected areas or in forest lands. Due to the absence of fresh materials for forests arrangement, inventory and inspections of forests during last years, the state account of wood fund and conducting the forest cadastre is considerably weakened. At present the issues of preservation of forest resources are included in the governmental programs: «The complex program of development of the forestry of Turkmenistan», the key place being occupied by preservation of forest cultures, pistachios in particular.

In the foothills of Kopetdag, near the capital and other large industrial centers of the country, on the area of more than 24 thousand hectares, the «green zone» of coniferous and deciduous trees and bushes is being arranged (1998-2009), forming «the green belt» for the cities. Formation of the woody and shrub breeds green ring is a part of the process of reforestation.

The main wetlands of the Turkmen coast of the Southeast Caspian sea – Turkmenbashi, North Cheleken, Balhan and Mihajlovsky, from 2009 are under Ramsar Convention as wetlands of the international value. The bay of Turkmenbashi is the Key Ornithological Territory (COT), which in January 2007 was awarded with the first official international certificate. Today the country actions at the Caspian coast are aimed at problem-solving of reduction of the biodiversity and decrease in quality of environment (pollution) on the background of the biological resources reduction (fish stocks), deterioration of the coastal infrastructure condition and habitats, and petroleum industry impact in the region. Within the frame of special program of the integrated management of the Caspian sea coastal territories, problems of preservation of the deep-water genetic resources reducing to a minimum of anthropogenic destruction of habitats, deterioration of soil layer and desertification of territories (Appendix I) have been examined.

Genetic resources. In Turkmenistan 172 species of wild relatives of vegetative cultures have remained, including 40 breeds of fruit crops and the group of leguminous plants and vegetables, making a basis of modern agriculture *(barley, rye, vetch, onion, carrot, etc.)*. They represent 69 % of the total number of breeds of the Central Asian genetic center. Presence of a huge number of endemic species among wild relatives of the cultural plants, specific only to Kopetdag with the adjoining Khorasan and Koytendag, underlines the high global importance of this center of the genetic diversity in the origin of cultivated cultures. This center matches the centers of livestock breed formation: *markhor (Capra falconeri)* and *bezoar goat (Capra aegagrus)* - the ancestor of the domestic goat, and species and subspecies of Ovis genus – of the domestic sheep. Out of all world fauna the representative of *Equus* genus – the Turkmen koulan *(E. hemionus ssp. onager)* has remained only in Turkmenistan. Since ancient times the local breeds of Turkmen greyhound (tazy) and Turkmen sheep-dog (alabai), ahalteke and iomud horses, and Turkmen single-humped camel – dromedary (arvana) are bred here.

The National Genetic Bank of Seeds of "Ak Bugday" (White Wheat) museum possesses 270 kind-samples of wheat, including 42 ancient native local selections and 144 kind-samples of barley. The indigenous core collection of the genetic fund of Mahtumkuli Scientific Production Center of Plant Genetic Resources (MSPCPGR), on 8 fruit crops (pomegranate, apple-tree, pear, plum, fig, pistachio and almonds) and grapes is represented by 409 specimens (including 186 indigenous kind samples and 223 wild-growing forms of the Turkmen origin), or 24,7 % of the general structure of MSPCPGR collection as of 2004.

Protected areas. Environmental sustainability of the country was defined by the national system of specially protected natural areas (PA), aimed at improvement, protection and rational use of ground and water resources, coastal territories and wetlands, providing thus preservation and biodiversity restoration. Protection of the biodiversity of Turkmenistan is implemented in the borders of natural SPA ecosystems of the three provinces: *Turan* where Repetek, Amudarya and Kaplankyr reserves operate. As a sample of natural richness of the Mountain-Central Asian province, Koytendag reserve is represented, where the cultural and natural riches are harmoniously combined. The Syunt-Hasardag and Kopetdag mountain reserves efficiently represent the biodiversity of Kopetdag-Horasan mountain province. Ecosystems of the Badhyz reserve lying on the joint of the Karakum desert, Kopetdag-Horasan mountains and foothills of Parapamiz are protected also. In the territory of Hazar (former Krasnovodsk) reserve, the typically dry trans-Caspian desert contacts the east part of the Caspian sea basin water.

The total area of specially protected natural areas (SPA) makes almost 4 % (or 1916, 02 thousand ha) of the whole territory of the country. The future of SPAs is a development of the advanced territories with different regime of protection *(constant and temporary)* where zoning principle is combined with involvement of environment restoration stakeholders. Territories of the regulated wildlife management of Turkmenistan (50 % of the country area) are detected. «The long-term development plan of the network of specially protected natural areas of Turkmenistan» is developed, the nature protection basic element of which being a national park. Preparation of environmental and economic feasibility study for establishing Sumbar national park in Mahtumkuli etrap (district) of Balkan velayat (region), and Archabil national park in Ahal velayat is in progress. Establishing of these parks, the first ones in the nature protection practice of the country, will lead to considerable expansion of the area of protected territory. The process of investment into development of the environmental tourism in protected areas has been launched that in perspective will generate the new market - the market «debts for the nature». The process of the protected areas management efficiency control is initiated according to the international procedure developed for the World Bank and WWF. Within the framework of 19 projects supported by GEF, international financial aid has been rendered to the country for implementation of the program of works on protected areas (Appendix III).

The electronic illustrated Catalogue of the nature protection objects (landscape, botanical, zoological, water, geological and paleonthologic) of the Southwest Kopetdag (2006) includes 81 of 104 nominees on the “nature monument” status, supported by 800 photos. The most comprehensive information on the reserves of Turkmenistan is published in the «Reserves of the Central Asia and Kazakhstan» collection (2006) by the address: *(http://iucnca.ne).*

50 key ornithological territories (KOT) are identified and described in the territory of Turkmenistan that will serve as a documentary substantiation for enhancement of functioning of the system of protected areas and carrying out of monitoring researches in their territory. The key ornithological territories of Turkmenistan became the component of the world net of the Bird-Life International Union.

National Biodiversity Strategy and Action Plan (BSAP, 2002). The BSAP structure is aimed at implementation of the main targets of the Convention. The key target and 12 main targets are identified in BSAP, which have allowed the country to clear up the global target for the period till 2010. 55 actions and 253 activities have been planned, which have been distributed within 14 strategic components (target tasks), showing how the key target and main targets will be implemented. As a result of the target implementation, the indicator "outcome" has been used. Having studied implementation of BSAP main targets for 2008

(Monitoring and efficiency assessment…, 2008), their partial implementation (49,0 %) has been identified. In the list of 12 main targets and target tasks of the national BSAP, 11 global targets and 21 target tasks within the frames of 7 thematic CBD programs are comparatively fully represented, though execution of those is far from full-scale. Certain difficulties have been met during implementation of the 1 and 2 target tasks of the CBD Global program. The resources on expansion of the protected areas network to 6 % by the end of 2008 have not been realized yet

The absence of accurately assigned interdepartmental agreements on the background of the gaps existing in the legislative space of the country, have complicated the process of implementation of the CBD Global targets. The nature protection activity of the country has been directed (section 2.3.) basically on preservation of species and their sustainable use, and to the considerably lesser extent — on training/professional development and monitoring. The activities aimed at creation of the adequate environment, i.e. solving the problems of cooperation, assessing the influence of sectors of the national economy on the biodiversity against reforming of legal issues and search of the financial sources are partially executed.

The solution of a problem of decrease in the process of natural landscapes degradation (4 target task of BSAP) is considered today within the frame of the regional program «Central Asian Countries Initiative for Land Management» (CACILM); its implementation is scheduled for 10 years. In the environmental aspect the Program aspires to reduce the reasons of land degradation and its negative influence on functional integrity of the basic ecosystems by promotion of sustainable land management at different administrative levels. Execution of a number of actions aimed at the development of sustainable system of pasture and ponds management are being planned. Attempts of restoration of some traditional pasturing systems, including the use of traditional gathering of water and its storage are carried out. Within the scope of the CACILM program, the project «Creation of potential and investment at the local level for sustainable land management» was started; its activity is aimed at the restoration of the Central Kopetdag forest recourses and model elaboration on restoration and sustainable management of pastures in mountain and deserted areas.

Considerably low indicator of unprofitable efficiency (49 %) of BSAP implementation is caused also by the partial execution of actions for management in the absence of the information center on BSAP implementation — analogue of CHM center (or the Biodiversity Center). The national BSAP as the state document, has been approved by the State commission on fulfillment of commitments of Turkmenistan with respect to the UN environmental conventions and programs, but has not been confirmed by the head of the state and has not been accepted for management and execution by the national economy sectors.

The national BSAP target tasks have not been included in the corresponding sectoral strategies, plans and programs, except the Caspian environmental program (CEP). Within the frame of CEP such documents, as NCAP and TDA have been elaborated; the CEP Protocol on biodiversity is being developed. According to the EIA demands, actions for environmental assessment are included in each project on the Caspian sea natural resources development. The BSAP list of target tasks does not comprise two global targets: 4.3. «No kinds of wild flora and fauna are subject to the threat by international trade» and 11.2. «Technologies according to item 4 of the Article 20 are transferred to the parties which are the developing countries, for effective implementation of their commitments within the framework of the Convention».

Implementation of the Strategy plan is basically focused on the decrease in existing rate of the biodiversity loss. The national indicators have been presented as results, as criteria of the success estimation or assessment of the completion rate of the given kind of activity. Implementation of the planned BSAP actions promoted elimination or mitigation of certain threats endangering biodiversity. Apparently, to decrease the load on the biodiversity, it is

necessary to engage the economic levers that will enhance implementation efficiency the BSAP itself.

The analytical report «Monitoring and assessment of efficiency of the biodiversity strategy and action plan» implementation (2008) became substantiation for entering of the additional priority actions. This has allowed adjusting the existing BSAP with the subsequent decisions of Conference of the Parties during 2002-2007. Having studied a course of implementation of the strategic plan it was detected that the plan is executed on 49 % and it was offered to add it with 23 new priority actions (Appendix II).

The mechanism of CBD agency. The resources for establishing the planned national Center on Clearing-House mechanism – the tool of intermediation of the Convention on the biodiversity are prepared. The general frame of parameters of national capacity for the formation of the system of biodiversity monitoring is outlined. Functions of the agency mechanism in Turkmenistan are focused on the exchange of the thematic information with all Parties of the Convention and will be used for maintenance of the national (internal) biodiversity resources management. All documents of the country on implementation of decisions of the biological diversity Convention at national level will be presented on CHM site. Works on sustainable use of PA bio-resources and their management enhancement are being conducted. The cross analysis of the problems on biodiversity preservation at three levels (system, institutional and individual) has promoted developing a list of practical recommendations about capacity building for implementation of BSAP priority actions.

Financial resources. Turkmenistan having the status of a developing country is guided basically by national sources of financing. The national budget of the country allocates expenses on scientific biological researches, including also the needs of preservation of the biodiversity.

External financial support (about 40 projects) through the international grants together with budgetary financing has enabled to enhance the state system of protected natural areas, to publish the Red Data Book of Turkmenistan and to generate CHM. Certain BSAP actions have been financed by the international donors. The country has got support of GEF on development of the national biodiversity strategy and action plan, self-assessment of national capacity for the Convention implementation, execution of a number of actions for biodiversity preservation in-situ and ex-situ, and also preparation of national reports on implementation of CBD targets, etc. Despite all these actions, the country does not lack financial resources for BSAP implementation and corresponding CBD programs.

At the same time, for execution of the obligations under the Convention, the country is ready to start formation of the new economic tools and incentives. It is necessary to calculate the cost of “ecosystem services” at national level and make the related assessment of the ecosystems input into the global biosphere sustainability.

Conclusions. Thus, weak inter-sector cooperation on sustainable use of the biodiversity has limited capabilities of the country to fully implement all CBD targets, including Cartagena Protocol themes. The methods of assessment of economic effectiveness of the natural resources are also not introduced into the country practice, although these are reflected in the BSAP target tasks. The absence of Coordination group for management and administration of the process of BSAP implementation has also complicated the problem of collection of the interdepartmental information on main biodiversity components, for assessment and monitoring of the process of implementation of commitments of the country under the Convention on biodiversity.

In the process of development and elaboration of all national reports, materials and surveys, related to implementation of the Convention provisions, the related capacity has been built in the country with broad participation of local communities and persons of the state level. Certain success has been achieved in implementation of the task, targeted on 2010, and strategic plan. Discussion of all issues with the involvement of local population has allowed not only to make clear the importance of the Convention articles for all participants, but also to provide general discussion of possible ways of their solution at local level. Positive results were obtained during implementation of the work program on protected areas (Appendix III b), while having considerable gaps in solving the global strategy of plants protection at national level (Appendix III a).

The representatives of Turkmenistan as members of governmental delegations have participated at the meetings of the CBD parties of the Conference. The Convention plays the leading role in Turkmenistan in solving the international issues related to the biodiversity preservation. Most of the targets and tasks of the CBD strategic plan are successfully implemented in Turkmenistan. Many of the national BSAP targeted tasks (more than 70%) can be executed by the year of 2010.To succeed in future, it is necessary to dedicate attention on integration of the interests of preservation and sustainable use of biodiversity into the regional and national documents and processes, related to the main fields of the country's economics (such as, agriculture, forestry, fishery and trade), and also on the increase of the level of coordination at national scale.

This is why, as of today the key task of the Ministry of Nature Protection (MNP) is to ensure functioning of the National Information Center on biodiversity, as a tool of international cooperation and reporting to the biodiversity Convention. Sustainability of the Clearing-House Mechanism (CHM) will promote building capacity in the country for information exchange, both inside of the country and outside. Turkmenistan shares the opinion of all CBD Parties – the value of the biodiversity is first of all determined by its economic value of the genetic resources, biological species, the role of ecosystems and landscapes in the economics sustainability of the country. The State commission for legislation enhancement and Interdepartmental commission for securing implementation of international obligations of Turkmenistan in the field of human rights act as the country's contribution into implementation of the target. On the basis of priority of international right in the activities for implementation of international commitments, major significance is paid to the existing legislation monitoring and adjusting it in accordance with the international standards.

CHAPTER I. GENERAL REVIEW OF STATE OF BIOLOGICAL DIVERSITY OF TURKMENISTAN, TENDENCIES AND THREATENING FACTORS

The fourth report of Turkmenistan on implementation of the UN Convention on biological diversity ((CBD) at national level is one of the components of the third edition of the Global outlook in the field of biodiversity. According to the UNEP Global biodiversity assessment, 34 000 plant species and 5 200 animal species have already disappeared or are endangered on the planet. At present one third of all amphibians and one fifth of mammals are endangered (The UN Global report on the planet ecosystems state, 2007). Today the loss of biodiversity on the planet is considered as the economic suicide. Turkmenistan, having entered the international community as the independent, neutral and sovereign state, declared its commitment to the international agreements on nature conservation.

Turkmenistan is located in the western part of the Central Asia and occupies the territory of 49,1 million hectares. In the north the country borders on the Republic of

Kazakhstan, in the east and the northeast – Uzbekistan, the south – Iran and the southeast - Afghanistan. Major part of the country (80%) is occupied by the deserts - Karakum (35 million ha), Sundukli with adjoining low mountains (2,8 million ha) and Near-Caspian deserts. Along the border with Iran the mountains of Kopetdag-Horasan mountain province are located (Kopetdag), on the border with Uzbekistan – Koytendag of Pamiro-Altay mountain system, on the border with Afghanistan – Badhyz hilly mountains as the northern part of Parapamiz foothills. The range of altitude fluctuations is from -92 m (Archakay depression) to 3 139 m (peak of Turkmenbashi, or Ayrybaba mountain, Koytendag range). The three floral regions are intersected in the territory of Turkmenistan: Kopetdag-Horasan, Turan and Montane Central Asian, that provides high level of species and genetic diversity and wide range of natural ecosystems.

The study of biodiversity of Turkmenistan – the component part of Mediterranean platform – is closely connected with different aspects of preservation of species, habitats and landscapes that as a result determines main environmental parameters. The understanding of this issue found reflection in the national policy of Turkmenistan that entered the way of harmonization of our society, adequately reflecting the global XXI century Agenda in the *"Strategy of Social and Economic Reforms in Turkmenistan for the period till 2010"*. The biodiversity preservation, being a problem of planetary scale, is equally vital for Turkmenistan, because along with the global climate change prevention and struggle against poverty it is one of the key tasks to be solved by the mankind on the way to sustainable development.

1.1. General review of the biodiversity components state

According to the World Wildlife Fund, the territory of the country is in the limits of one of the 200 global environmental regions, within the limits of which two global hotspots of the biological diversity are located – Iran-Anatolian (Kopetdag) and Central Asian mountains (Koytendag). The key role of Turkmenistan in the world consists in preservation of the unique mass of the natural ecosystems, providing functioning of the biosphere in whole; where the biodiversity is the most valuable component of the national heritage and the leading strategic resource of the country. This is why the leader of our country regards biodiversity as the national wealth, the key constituent part of the sustainable development of the region.

1.1.1. Agrobiodiversity

Agrobiodiversity of Turkmenistan is a part of traditional lifestyle and national culture. More than a half of the Turkmenistan population live in rural area and is engaged in the agricultural activities. On-site preservation of biodiversity is directly implemented by farmers (daykhans).The total area of agricultural lands is 40,2 million hectares, out of which 38,2 are distant pastures with the developed livestock farming and about 2 million ha – irrigated husbandry. Main infrastructure of the agroindustrial complex is concentrated in irrigated areas (Esenov, Durikov, 2007). Along with the state sector in the country, within the frame of *„The New Village"* program the new system of market relations has been formed – farming, a farmer becoming the main engine in implemetation of the food program. As of today the agronomic sector of the country is represented by 497 daykhan (peasants) associations, where 395,7 thousand farmers and private persons got for use about 83% (1,5 million hectares) of irrigated lands.

Cotton growing (42% of the cultivation area) and grain crops (49,0%) are the basis of agriculture in our country, the other crops as melon and gourd cultivation, gardening, vegetable growing and viticulture occupying 4,0%. The share of perennial plantations (including gardens and vineyards) is 0,24%. The area of fruit and berry growing is 20,6 thousand hectares, vineyards – 28,1 thousand hectares.

The existing legislative acts of Turkmenistan have created preconditions for assessing the interrelation between agricultural practice, preservation and sustainable use of the biodiversity components. At present the special program of sustainable use of agrobiodiversity components (biological diversity of agricultural value) is not developed at national level. At the same time Turkmenistan, without being the party of the International convention and the international union for protection of new kinds of vegetation (UPOV), has signed in 1995 the Declaration on prolongation of membership in the Convention of the World Organization of Intellectual Property (WOIP). The possibilities of application of Bonn guiding principles as the access mechanism to genetic resources and distribution of benefits are studied in the country. Preservation of national agrobiodiversity, its species structure with features of concentration in places of their origin is one of the priority problems of NEAP, as legislatively confirmed governmental document, and also BSAP.

Wild relatives of 172 cultural kinds of plants have remained in Turkmenistan, out of which woody-shrub group of wild relatives of fruit crops is represented by 40 species. Many age-old kinds of agricultural crops and breeds of domestic animals, during long period of cultivation well enough adapted to local conditions. Presence of huge number of endemic kinds among wild relatives of the cultural plants, peculiar only to Kopetdag with the adjoining Khorasan and Koytendag, indicates high global importance of this genetic diversity center in origination of the domesticated cultures. Many vegetative cultures *(barley, rye, vetch, onion, carrot, etc.*, totally 172 kinds, *or 69 % from the total number of kinds)*, making a basis of modern agriculture, are originally timed to the Central Asian genetic center. This center matches the breeding grounds of the domestic animals breeds formation: *markhor (Capra falconeri)* and *bezoar goat (Capra aegagrus)* - the ancestor of a domestic goat, and species and sub-species of Ovis genus – domestic sheep. Concerning world fauna, the representative of *Equus* genus – Turkmen koulan (*E has remained. hemionus onager)* has remained only in Turkmenistan. Since ancient time the local breeds of Turkmen Borzoi hound (tazy) and Turkmen sheep-dog (alabai), ahalteke and yomud horses and Turkmen one-humped camel, dromedary (arvana) are being bred here.

Out of big number of agricultural crops, the two most strategically important cultures are cotton *(Gossypium hirsutum)* and wheat *(Triticum aestivum)*, although melons and gourds were the leading sector in agriculture for a long period. For example, melon (more than 400 kind varieties of *Melo sativus*) occupied the first place by plantation areas. However at present, due to the certain reasons, its area and production per capita have dramatically decreased; one of the reasons being plant pests, melon fly *(Carpomyia pardalina)* in particular. Today small production areas are occupied by pomegranate, apple and watermelon plantations; this is mainly caused by the water resources shortage. Xerophytes (drought-resistant crops), like pistachio and almonds, the genetic fund of future forest-gardens, are put in the forefront of the agricultural sector. Sheep, horse and camel breeding are of priority importance in livestock farming. Traditional knowledge of livestock breeding, horse breeding, melons and gourds, dry farming is preserved and handed down from a father to a son or from a tutor to an apprentice. However, the problem of traditional knowledge preservation in indigenous communities (farm enterprises) is not reflected in any of the existing legislative norms.

Strengthening of the national breeding program is aimed at identifying the new perspective production lines of such food crops as wheat *(Triticum L.)*, barley *(Hordeum L.)*

and pulse plants (gram, pea, corn), quick seed reproduction and their introduction in the farm fields. The National Genetic Bank of "Ak Bugday" (white wheat) Museum has a collection of 270 kind-samples of wheat, including 42 ancient natives of local breeding, and 144 kind-samples of barley.

As of today, the specific arrangements for preservation of genetic diversity of all agricultural crops and local varieties, providing food independence of the country (excluding wheat) are not developed to the sufficient extent. The country is not a party of the FAO International Agreement on conservation of plant genetic resources, although the process of forcing away from the market of local ancient kinds of vegetables (tomatoes, cucumbers, eggplants, garden radish, pepper) becomes considerably stronger every year. The information field on GMO products is not created in the country, and even decision-makers do not have clear understanding of this issue. Using "law gaps" in the national legislation, the exporters do not mark the imported GMO products.

Existing laws in the field of intellectual property deal with the issues of bio-security indirectly, without considering legal norms on the nature protection and wood property, in particular, the national property on genetic resources of fruit crops and their wild-growing relatives. Now in Turkmenistan there is a process of preparation of the law *«About protection of selection achievements»*, that will regulate property and personal non-property legal relations, that arise during formation, legal security and use of the new patented kinds of plants. But the question on the rights of farmers remains opened, as well as the problem of the legal security of the species, bred with the use of the wild-growing fruit crops genetic fund.

Having signed the Cartagena Protocol on the CBD bio-safety (23.02.2008), the country initiated the work on preparation of the project offer «Development of the national frame documents on bio-safety», upon completion of which the country will start implementing specific actions within the frame of the next project - «Introduction of bio-safety systems». As a result, necessary capacity in the sectors dealing with GMO products monitoring will be created that will promote introducing bio-safety system, i.e. arranging laboratories for identification and analysis of GMO containing products, establishing the GMO products information field – to have a clear notion about this issue.

CP-9 of CBD (19-30.05.2008) has supported the Global action plan of FAO in the field of preservation of genetic resources of animals as the internationally coordinated structure containing strategic priorities of sustainable use, development and preservation of genetic resources for foodstuffs production. For the Central-Asian region countries it is strategically important to have the interstate agreement on preservation of local/ancient kinds of fruit crops and their wild-growing relatives – a natural genetic fund of maintenance of sustainable fruit-growing development.

Within the framework of cooperation of the Ministry of Agriculture of Turkmenistan with IPGRI, the process of formation of the positive environment for decision-making on working out of measures of stimulation of biodiversity preservation in farms has begun, in particular - preservation of fruit crops and their wild relatives. The genetic fund of a number of crops in-situ in the region of dry subtropics has essentially fallen into decline by the beginning of the new century. This is detected by the results of the 2008 inventory of a live collection of fruit crops of MSPCPGR: 1937 samples against 4040 in 1980. The core collection of MSPCPGR genetic fund by 8 fruit crops (pomegranate, apple-tree, pear, plum, fig, pistachio and almonds) and grapes is represented by 409 specimens (including 186 native kinds and 223 wild-growing forms of the Turkmen origin), or 24,7 % of the total quantity of the MSPCPGR collection. This collection as an information resource is important for the use by local farmers in the course of works on domestication. The ex-situ preservation status in the country is represented by genetic bank of MSPCPGR and «Ak Bugdai», six institutes-ex

situ holders, that collected 14 510 samples; there is a Database available for 908 of them upon the results of inventory (Regional strategy on preservation, replenishment and use …, 2007).

The integration of actions related to the climate change impact, is basically aimed at analyzing of vulnerability of the major sectors of economy and ecosystems. According to experts, the impact assessment of climate change is needed for developing the adaptation strategy as retaliation to climate change that will allow developing the Package of recommendations within the frame of the National Action Plan of implementation of the preparatory measures on greenhouse gases emissions reduction. Within the frame of the project «Turkmenistan: preparation of the second national report on the UN FCCC» (2006-2009), the work on national inventory of the greenhouse gases is being executed. On the basis of the analysis of adaptation of biodiversity to possible climate change, the corresponding assessment of vulnerability of their components will be given (Akmuradov, Ballyev, Eeberdyev, 2007).

Climate warming leads to reduction of precipitations amount practically on the whole territory of the country and to the increase in annual amount of evaporations from the water surface. The quantity of winter "droughts" as well as need of plants in water (probably, up to 60 — 70 %) is considerably increasing. The lack of winter/autumn accumulation of soil moisture negatively affects growth and development of pasture vegetation, influencing productivity and qualitative forage structure. The target task of burden decrease on biodiversity, caused by climate change, is included in additional actions of BSAP (Monitoring and an efficiency assessment …; 2008).

The basic source of fuel and electric power in Turkmenistan is a fossil fuel - the natural gas, which resources, in due course can be limited. Today almost all territory of the country is covered by the system of gas supply, and special requirement in renewable fuel sources is not visible yet. Besides, the solar energy is utilized in a very limited amount.

However, the biological diversity of Turkmenistan can also be used for the stable provision of biomass for bio-fuel manufacture *(for example, from sugar cane, corn or excrement of sheep and goats)*, thus satisfying the growing energy needs of the population. Thus, dense reed-beds of sugar cane *(Saccharum spontaneum)*, or Gallam in Turkmen, along the high-water bed of Amudarya river and upper reach of Murgab are suitable for production of ethanol bio-fuel; it is extracted from the vegetative cellulose. Such bio-fuel can be mixed with automobile gasoline and diesel fuel, the products of oil refining. The "switching over" of vehicles to the renewable energy sources instead of burning fossil fuel will allow reducing the motor emissions.

1.1.2. Biodiversity of Forest Ecosystems

The forest ecosystems provide a wide spectrum of goods and services. Being the CBD party, Turkmenistan automatically became the participant of the International FAO Agreement about vegetative genetic resources for manufacture of the foodstuffs and conducting agriculture, and the Party of the Regional strategy of preservation, replenishment and use of genetic plant resources for the foodstuffs and agriculture in the Central Asia and Trans-Caucasus for the period till 2015 (2007). Within the frames of BSAP (2002-2010) the special package of "insurance" actions aimed at preservation ex-situ and protection of forest genetic resources of the country is developed. The mechanism and the form of implementation of the Strategy isn regional cooperation, partnership and activity coordination on genetic resources which is executed by the Central-Asian and Trans-Caucasian network on genetic plant resources.

The total area of the state forest fund (SFF) of Turkmenistan is 20,3 % of the country's total area (49 120 thousand ha). The area covered with forest occupies 41 % of the SFF area, or 8,1 % of the country territory. Forests of Turkmenistan perform protective functions and are referred to the category I. The category I forest areas include mountain (524 thousand ha) forests with the very limited area of juniper (archa) light forests, and especially fruit crops (data on areas by species are absent). The largest areas are occupied by sand-desert (9351) and riparian (tugai) (44,5 thousand ha) woodlands.

Up to 14.04.2009 the main part of the forest fund of Turkmenistan was managed by the forestry enterprises which have been united in "Gyok Gushak" (Green belt) association. At present forestry enterprises and specially protected natural areas (reserves, sanctuaries) are at the possession of the Ministry of Nature Protection. The local authorities give the plots of woodland for execution of the forestry activities to the possession of the forestry enterprises, forest and pilot farms. Therefore the main proprietor of the genetic plant resources is the state, independently, whether GPR grow in specially protected areas or the woodlands.

Archa *(Juniperus turcomanica, J. zeravschanica; 66,2 thousand ha)*, pistachio *(Pistacia vera; 100 thousand ha)* and deciduous mountain forests *(Acer turcomanica, Celtis caucasica, Ficus carica, Berberis turcomanica, Crataegus pontica, etc.)* of Kopetdag, Big Balhan and Koytendag canyons form a unique biological backbone of wood plantings – a major factor of sustainable preservation of all mountain ecosystems.

During the last century the area juniper woods was reduced by more than 30-40 % and their environmental border has risen by 500-700 m above its optimum (500 m above sea level). If in the end of XIX - the beginning of XX century the area juniper forests in Kopetdag was 420 thousand, then by 1990 there remained only 42,02 thousand hectares. The density of plantings has fallen from 0,8-0,9 to 0,1-0,3. The archa light forest of Kopetdag, at suppressed natural reproduction of saplings, has turned into *rare* (rarity) *community*, outside of functioning of which it is impossible not only to preserve the rarest species of the mountain forest flora, but also to provide economic sustainability of the mountain region and adjoining plains. For the purposes of the public attention attraction to the crucial role of juniper in preservation of biotic and abiotic factors of habitat, this species has been included in the Red Data Book of Turkmenistan (1999).

Desert forests (688,1 thousand hectares) are presented on hilly sands by white-saxaul *(Haloxylon persicum)* communities, plain sands - by black-saxaul *(H. aphyllum)* with participation of Richter glasswort *(Salsola richteri)*, varieties of kandyms *(Calligonum)*, ephedra *(Ephedra)*, sand acacia *(Ammodendron)*, etc. The typical riparian (tugai) vegetation of river valleys is rerepresented by blue-grey leaved poplar *(Populus pruinosa)*, dzhungar willow *(Salix songarica)*, eastern oleaster *(Eleagnus orientalis)*, tamarisk *(Tamarix)* with the obvious abundance of reed, wetlands grasses and macereed varieties *(Typha)*. In the open areas with centers of steady salinization, poplar communities were replaced by tamarisk groupings with desert thorn *(Lycium kopetdaghi)*, galotamnus *(Halothamnus glauca)*, wormwood *(Artemisia kopetdaghensis, A. oliveriana)* and tall grasses synusias.

Apart from natural plantings huge areas are occupied by artificial forests (36,4 thousand hectares), providing forestation of desert territories. Mountain foresting activities are in progress also. In the foothills of Kopetdag near the capital and other big cities on the area of more than 24 thousand hectares, the woodland park zone is created (50 million trees) composed of coniferous and deciduous trees and bushes (1998-2008), forming «a green belt» of the cities.

Importance of wood plantings is legalized by the Forest Code of Turkmenistan (1993): it does not comprise such categories, as forest genetic resources; country of origin of genetic resources; country providing genetic resources; there are no data on the legal rules of protection of wild relatives of wood cultures. Starting from 2001, preparation of the new

Forest Code edition is in progress; it will lay a way to the development of private forest ownership. Due to the absence of fresh forest arrangement materials, inventory and inspection of forests, during recent years the state account of forest fund and conducting the forest cadastre is weakened. At the same time the state programs are functioning in the country (2005-2010) aimed at restoration of juniper forests and creation of pistachios forest parks. Prevention of woodlands fragmentation is one of the alternatives of adaptation to climate change consequences.

The issues of preservation of forest resources are included in the governmental programs scheduled for the period from 2005 to 2010: «Restoration of juniper forests in Turkmenistan" and "Creation of pistachio forest parks in Turkmenistan». The Memorandum of mutual cooperation between Turkmenistan and the Turkish Republic in the field of forestry (1997) is signed. The Turkish company «Finturi L.T.D., together with «Gyok-Gushak" JSC, has developed "The Complex program on development of the forestry in Turkmenistan for 2001-2005», a key place whereof is occupied by preservation of forest cultures, pistachios in particular. Within the framework of the joint project of the Turkish agency on cooperation (TICA) «Creation of pistachio forest parks» (2006-2008), works on preservation of their natural genetic fund are developed.

1.1.3. Biodiversity of Wetlands

After ratification by Turkmenistan of the Ramsar Convention (03.03.2009), the basic wetlands the Turkmen south-east Caspian coast: Turkmenbashi, North-Cheleken, Balhan and Mikhaylovsky, the bays of the southern part of Hazar reserve, including Delili lake, the system of lakes within the boundaries of Kelif reserve together with Zeid reservoir storage, the valley of Amudarya within the limits of the same name reserve, Hauzhan water reservoir storage and the lake of Sarykamish – can be nominated as the wetlands of international value.

In Montreal (09.01.2007) the innovative cooperation standards within the frames of Ramsar Convention and Convention on Biodiversity (CBD) have been established, by means of joint action program development. Within the framework of Bonn Convention, the Inter-State Agreement about preservation of the Afro-Eurasian migrating wetland birds is functioning. Certain actions on the wetland birds preservation implemented by Turkmenistan within the frames of international cooperation enable its joining to this Agreement.

Turkmenbashi bay is the first Ramsar land in Turkmenistan and the first key ornithological territory that in January 2007 was awarded with the first official international certificate. *Hazar reserve* with Ogurchinsky sanctuary and protected zone is functioning on the south-east Caspian coast. The sea ecosystems PA area is 268 thousand hectares, or 14% of the total PA area. Due to the excessive consumption of the resources and distraction of habitats by commercial fishery, in the coastal zone of the bays and in the coast depressions the processes of anthropogenic desertification, salinization, flooding, water-logging and swamping are developing. High mineralization of soils and ground water (more than 100 g/l) led to nearly total loss of vegetation on Balhan residual salt marshes.

The wetlands biodiversity of the Turkmen Caspian coast are subject to some stresses; and to define its condition the full-scale monitoring program is needed, based on the remote probing that should be connected to the programs on fishery, pollution and oceanography. The available data on ground biodiversity, monitoring of the protected area of Hazar reserve and adjoining territory are insufficient for identifying the risk factors and tendencies of threatening factors development. To have better understanding of the system and forces, that control marine biodiversity as of today, it is very important to identify trophic relations between plankton/pseudobenthos and higher predators. For example decrease in water purity

has already led to appearance of different types of abnormalities among fishes (TDA CEP, 2007).

The modern database on biodiversity and a number of monitoring programs on coastal and maritime trans-boundary Caspian ecosystems have been developed and created. The inventory of especially vulnerable Caspian territories has been executed; interactive map and "Action plan on Caspian seal protection" have been developed. It is discovered, that the main threats for the Caspian seal *(Phoca caspica)* are: dog hydrophobia, resistant toxic chemicals that decrease the cow-seals breeding performance and increasing commercial fishery. The state of seal population is also negatively influenced by deterioration of its nutritive base, for example sprats, as well as by over-fishing and navigation during the period of whelping. The number the Caspian seal population is still under doubt – from 110 thousand to 350 thousand animals along the whole Caspian seashore (TDA CEP, 2007), and not exceeding 1 thousand (Erohin, 2008) in the Turkmen water area part.

The last aviation-account data (2007) has shown that in the wetlands territory of the Turkmen part of East Caspian more than 289 species of birds are concentrated (from them 166 wintering). 48 kinds of fishes and the biggest of mammals, the Caspian seal – endemic of the Caspian sea inhabit the area. 41 species of algae macrophytes and 5 kinds of underwater hydrophytic plants inhabit the sea bays. The coastal flora of vascular plants is represented by 502 kinds, that structurally is close to the flora of Karakum (Kamahina, 2008). The nutritive base for birds and representatives of ichthyofauna is formed by hydrophytic plants and 29 kinds of zoobenthos (crustaceans, worms, mollusks and insects). According to the wetlands classification (Rustamov, Milyutin, Belousova, 2008), 14 habitats of wintering waterfowls of the East Caspian which have been distributed by 10 types inside of maritime, valley and watershed kingdom with blind areas are identified. This data will be used for conducting the wetlands monitoring.

Annually part of birds perishes during migration along the coastal (the East Caspian direction) and continental (Uzboy-Caspian and Prikopetdag-Atrek) transmigration route The trend of reduction of a number of birds in wintering, approximately by two-three times, was detected since 1980 The tendency of the birds abundance reduction, that is correlated with the cycles of change of birds amount during the nestling period against variability of separate climate parameters (Vasilev, Rustamov, Milyutin, Belousova, 2007) is also preserved. The winter quantity of wetland birds at the Turkmen Caspian sea coast in 2007 amounted at 439779 units (41 species) in January, 184359 in November that confirms their key role on transmigration route (Rustamov, Shcherbina, Guychgeldyev, 2007).

The marine aquaculture in Turkmenistan is practically only starts developing. During recent period activities on artificial cultivation of the Caspian sturgeon kinds of fishes (beluga — *Huso huso*, Russian sturgeon — *Asipenser gueldenstaedtii*, starred sturgeon — *A. stellatus)*, and caviar production manufacture are being implemented, and also works on restoration of trade stocks of crayfish and ponds cultivation of *Artemia salina*. Own manufacture of natural and artificial fish forages (the Third national report, 2006) is arranged.

For enhancement of environmental conditions in near-Caspian region of Turkmenistan, since 12 August 2006 functions the Frame (Teheran) convention on protection of the sea environment of the Caspian. The National Caspian Action Plan (2007), as a foundation for coordination of actions on solution of national and trans-boundary environmental problems has been developed. Within the framework of the Caspian environmental program (CEP) the Protocol on biodiversity to the Frame convention on

protection of the Caspian sea environment is developed. The regional consultative group on biodiversity and alien species is operating. Implementation of "The Regional strategy and action plan» (2004) will enable the countries-participants (Russia, Kazakhstan, Azerbaijan, Iran, Turkmenistan) to solve certain national problems on sustainable fishery management and all its biological resources. The quantitative assessment of coastal and sea habitats of the Caspian sea is executed, preliminary list of near-Caspian habitats is developed and the updated database of experts in the field of the Caspian sea biodiversity is created. With the grant support of «the Darwin Initiative», the project on preservation of the Caspian seal and works on introduction of educational curriculums on biodiversity of the Caspian sea is launched. The key target of sustainable use of the Caspian sea bio-resources is included in NEAP (2002) and BSAP (2002).

1.1.4. Biodiversity of River Ecosystems

Biodiversity of inland waters is a key source of foodstuffs, incomes and means of livelihood. The river ecosystems provide preservation of hydro-biological balance and habitats of numerous plants and animals. The relict near-terraced forests of elm-trees *(Ulmus),* poplars *(Populus),* ash trees F*fraxinus),* tamarisk (*Tamarix),* etc. are formed along the valley *(Amudarya and Murgab)* and mountain *(Sumbar, Chandyr, Atrek, Ssherlok and other)* rivers of Turkmenistan.

The present tugai forests in Amudaya and Murgab flood plains with their feeders are developed and degraded today differently, occupying interrupted strips from 50 to 500 meters. They are represented by big variety of indigenous and derivative phytocenosis that during the long period of time have gradually been displaced by agricultural crops plantations. As a result of extensive decrease of the river flood plains vegetation areas, the “grass” tugais with small share of tamarisk bushes are primarily developed. The riparian forests degradation is accompanied by their displacement by communities comprising glasswort *(Salsola dendroides),* wormwood and thistle groupings *(Halostachys caspica and Halocnemum strobilaceum).* Willow *(Salix acmophylla, S. excelsa)* and Asiatic poplar *(Populus pruinosa)* have either disappeared or continue to disappear from the community; oleaster formation remained only as small fragments in the near-bed of Amudarya and on large difficult to access islands. The delta of Atrek, the biggest mountain river of the south-west Kopetdag, today is practically deforested, and in Sumbar and Chandyr valleys, the wood-bushy riparian forests of different degradation degree are still remaining on the area not exceeding 16-17% (Gladyshev, 1992; Kuzmina, 1997). The project development of *«Provisions on protected areas and bank strips of Amudarya»* is finished that will have posistive impact on preservation of habitats of rare species of plants and animals. The basic species of economically valuable kind for this ecosystem is licorice *(Glycyrrhiza glabra).*

`The fauna of river fresh-water ecosystems with a separate exception includes almost all its representatives of inland reservoirs. Amphibious are represented by green and danatin *(Bufo viridis, B. danatensis)* toads, frogs *(Rana macrocnemis, R. nigromaculata, R. ridibunda),* many lizards, snakes, etc. Wild boar *(Sus scrofa),* otter *(Lutra lutra),* muskrat *(Ondatra zibethicus)* and nutria *(Myocastor coypus)* are the mammals representatives. The loss of tugai vegetation on big areas has led to the number decrease of francolin *(Francolinus francolinus),* pheasant *(Phasianus coichicus),* Turkestan lynx *(Lynx lynx)* and to disappearance of Turan tiger *(Panthera tigris).* In the valley of Amudarya during last years grey crane remains for wintering *(Grus grus).* Using modern methods of fish marking, examination of big and small Amudarya spade-nose *(Pseudoscaphirhynchus kaufmanni; P. hermanni)* have been conducted. New data on the area of distribution, quantity, systematics,

reproduction biology and migratory activity of these kinds of fishes have been obtained, and also measures on their preservation have been developed.

The Memorandum of mutual understanding on preservation of tugai deer *(Cervus elaphus bactrianus)*, signed within the framework of the Bonn Convention by the Central Asian region countries *(Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan)* became the political result of the undertaken efforts. In the middle flow of Amudarya, the Amudarya reserve (49,5 thousand hectares) with Kelif sanctuary (103 thousand ha) is functioning. The PA area of river ecosystems is 152,5 thousand hectares, or 7,6 % from the total PA area.

1.1.5. Biodiversity of mountain ecosystem

In the history of nature and culture of Turkmenistan, the key centers of biodiversity remain Kopetdag mountain ecosystems together with Big Balhan – marginal ridge of Turkmen-Horasan range, and Koytendag - the southwest end of Gissar mountains of Pamir-Alay range. Due to the insignificance of absolute heights, the mountains do not reach the present altitude of glaciation and do not provide sufficient moisture for the territories. This region is distinguished by great variety of the ecosystems, obvious wealth of kinds, high number of endemic and endangered species and big genetic diversity of agricultural crops, livestock and their wild relatives.

High level of cultural diversity of the mountainous Kopetdag, B.Balhan, Koytendag and ridges of Parapamiz is defined, first of all, by a key role of local communities in preservation and management of biological diversity. At the same time, mountain areas are exposed to stress as a result of anthropogenic activity, for example excessive overgrazing of pastures (Esenov, Durikov, 2007).

In mountain ecosystems of the Central Kopetdag, the *Kopetdag* reserve (49, 8 thousand hectares) is functioning with 2 sanctuaries, 2 nature monuments and protected zone (108,02 thousand ha). In the south-west - *Syunt-Hasardag* (26,5 thousand ha) with a sanctuary (3,8 thousand ha) and Koytendag – *Koytendag* (27,14 thousand ha) reserve with 4 sanctuaries (95, 23 thousand ha). In the Southeast of Turkmenistan in Kushkinsko-Tedzhen interfluve in the foothills of East Kopetdag (Gyazgadyk range) and Paropamiz, *Badhyz* reserve (87, 7 thousand ha) is established with 3 sanctuaries (57 thousand ha). The mountain ecosystem PA area is 428,05, or 22,3 % from the total PA area.

The mountain ecosystem, occupying less than 5% of the territory of Turkmenistan, is a “hotspot” of the biodiversity concentration, the key role of those is connected to the center of cultural organisms origination, and from the other side – natural isolated shelters of the most ancient biological and cultural and historical relicts. 2/3 of the whole species biodiversity of the ground vertebrates are found in the mountains and foothills. In the territory of the Turkmen part of Kopetdag grow about 2 thousand kinds (Kamelin, 1973) and intersect the areal boundaries of 332 (or 18%) of endemic and sub-endemic species of Kopetdag-Horasan relationship. Among them - 27 narrow local endemic taxons in the Central Kopetdag and 48 – in the South-Western. The “island” range of B. Balhan numbers 475 species of vascular plants, Gissar Koytendag – 982, including 39 local endemics. Nearly 1600 species of local flora contain biologically active substances (State of biological diversity. Review, 2002).

Considerably rich is the vertebrate fauna: in Kopetdag -372, B. Balhan – 196, Koytendag – 226 species. High index of the flora and fauna endemism is related to the fact, that the boundaries of three large provinces are intercrossed here: Kopetdag-Horasan of the Mountain-Central-Asian *(Koytendag)* and Turan *(Karakums)* with a transition territory of Badhyz and Karabil. This was always attractive for the researches of all generations. The

poison of cobra and lebetina viper, poison of some spiders, toads and insects is also used for producing medicals and experimental drugs.

Non-regulated overgrazing of pastures has considerably undermined the natural resources of indigenous plants communities *(juniper, mountain mat-grass and fescue steppes, sibljak communities)* that led to the soil compaction and washout, surface flow and decrease in soil moisture. This has facilitated destruction of archa plantlets, preventing natural reproduction of small plants and thus intensifying the processes of mountain desertification. In the result of anthropogenic transformation of the mountain ecosystem groupings, the territory of long-standing abnormalities *(continuous utilization of pastures, diverse land fallowing, especially dry farming)* was enlarged by the plots of the newest failures. Wormwood communities are actively spreading out *(Artemisia turcomanica, A. ciniformis, A. gypsaceae, etc.)* with "weeds" groups of anthropophytes, migrating during recent years.

Prohibition of snake exportation from the country and closing down of the three serpentariums during the last 15 years created favorable conditions for restoration of their populations with the natural habitat limits. As a result, the number of the Central-Asian cobra *(Naja oxiana)* and lebetina viper *(Macrovipera lebetina)* increased by two times. It is offered (Shammakov, 2007) to exclude cobra and also grey monitor lizard *(Varanus griseus)* from the list of rear and disappearing species and to transfer them to the category of "restored species". This is related to the strict prohibition of the customs of any kinds of animal exportation from the country.

The quantity reduction of the mountain hoofed mammals – bezoar goat and markhor *(Ovis vignei)* has negatively influenced the leopard population *(Panthera pardus ssp. saxicolor).* Decrease in quantity of necrophage birds – griffon *(Gyps fulvus)*, black vulture (*Aegypius monachus)*, bearded vulture *(Gypaetus barbatus)*, etc., made them dependant on the conditions of the local livestock farming. As the activities of the natural regulator, leopard, the key component of the mountain biota becomes weakened, the number of wolves *(Canis lupus(* increases. They are better adapted to the inhabitance in anthropogenic environment, representing its sustainable element. Due to this, a special strategy of goitered gazelle *(Gazella subgutturosa)* reintroduction was developed from Ogurchinsky island (the Caspian sea) and other regions of the country to the south-west Kopetdag. The natural stock of its population was created, the quantity of which is gradually increasing. This gazelle population is utilized for providing of natural nutritive base for leopard population.

In the conditions of global warming, when average near-ground temperature may be increased by 0,6+/-0,2oC, the general climate change features will negatively impact the natural ecosystems (for example, juniper and deciduous forests, natural mountain pastures-steppes, etc.). This will increase existing risks of extermination of some of the most vulnerable moisture-loving species and loss of larger part of biodiversity *(especially among bulbous and tuberous plants).* Therefore, mitigation of the climate change impact on biodiversity should be considered as necessary condition for provision of the human population welfare and health, and also as national safety in the wide sense.

1.1.6. Biodiversity of sub-humid and arid lands

The plain-desert ecosystems *(Karakun sands, Sundukli, outh Usyurt and near-Caspian sands)*, that are dominating according to the area (80% of the territory) are related to sub-humid and arid lands of Turkmenistan. Karakum sand desert (35 million hectares) are inhabited by 757 species of higher plants, or 25,2% of flora) and 25 rare endemic species (Geldihanov, 1995). In Sundukli desert, together with the adjoining low-hills (2,8 million ha),

located on the right bank of Amudarya river between Farab and Koytendag foothills, 710 species were encountered (Yellybayev, 1996). In the desert of the north-western near-Caspian part of Turkmenistan – 434 (Rustamov, 1972), South Ustyurt desert – 294 species (Kogan, 1954). The composition of the Karakum flora is dominated by the goosefoot family species *(Chenopodeaceae)*, Compositae *(Asteraceae)* and cereals *(Poaceae)*. Too little trees (1,4-1,8%), annuals prevailing perennial (1,4-1,8%) grasses.

Predominant are such large landscape allotments of arid ecosystems as barkhan (dune) sands, fixed sandy-pebble and gypsum-bearing sands, kyr ridges of Zaunguz strata, takyrs and takyr-type soil, salt marshes and clay badlands. Shrub and sub-shrub vegetation of saxaul, mixed white-saxaul, wormwood, ephemeral-wormwood and other formations is predominant. Goitered gazelle and koulan are the national emblem of the desert; and of flora – white saxaul *(Haloxylon persicum)*, black saxaul *(H. aphyllum)* and varieties of sand acacia *(Ammodendron conollyi, A. karelinii)*. The area of saxaul plantations occupies 13,7 million ha, mixed white-saxaul – 63,4% of the Karakum area (Kaplin, 2008).

The arid lands are especially vulnerable to climate change, specifically to long-term drought, being constantly stressed by re-formations related to agricultural holdings, introduction of invasive species and environment pollution. Slight changes in temperature and precipitation regime can lead to serious consequences for biodiversity, as well as for the population and economy.

The arid conditions of Turkmenistan restrict to excess the biological potential of useful and perspective for practical utilization wild-growing plants. Turkmenistan did not join the Washington Convention on trans-boundary trade in wild fauna and flora species that are endangered (CITES), but it fulfils its demands. The normative and legal foundation exists in the country (The Customs code of Turkmenistan and Rules on moving the goods across the customs border), corresponding to the CITES principles, really influencing poaching and illegal trade. The total gasification of the settlements has already influenced and continues to positively effect the reduction of the desert ecosystems trees and bushes cutting.

Saiga *(Saiga tatarica tatarica)* is found in the northern and north-western part of Turkmenistan, generally near Karabogazgol area, South Ustyurt and Sarykamysh depression; hunting for it is prohibited. The wintering Ustyurt population numbers 2-3 thousand individuals. Solution of environmental problems in relation to saiga demands joint coordinated actions of the border countries. The signing of *"The Memorandum of mutual understanding of preservation, restoration and sustainable use of saiga"* provides Turkmenistan with the possibility of trans-boundary cooperation with Kazakhstan and Uzbekistan in relation to the issues of preservation of saiga and its habitats along migration routs, wintering and summering.

The first results of activities aimed at near improvement of the Turkmen koulan population status, included in the IUCN Red List (2007) are becoming obvious. Arrangement of high security level at the territory of Badhyz reserve promoted the animal number increase to 900 individuals by the end of 2004 (against 200-300 in 1999). This has led to the concentration of koulans into groups and reproduction. This quantity corresponds to the pasture capacity of the habitats. The action plan on stabilizing the number of this population has been developed.

Repetek sand-desert biospheric reserve (34,6 thousand hectares) is functioning at the junction of Central and South-Eastern Karakums. In future it will possibly become the national park of nature. In the contact zone of South-Eastern outskirts of Ustyurt, Zaunguz Karakums and Sarykamysh depression, *Kaplankyr* reserve is operating (282,2 thousand ha) with 2 sanctuaries (720.2 thousand ha). The PA area of the arid lands is 1 037,6 thousand ha, or 54,2% of its total area.

1.2. General review of threat factors development tendencies, endangering national biodiversity

The problem of damage prevention to the biological diversity is indirectly studied within the frames of the national EIA (2001) that is the key component of the environment impact assessment. Facilities that are potentially dangerous for biodiversity pass through the obligatory EIA procedure, especially those dealing in the field of oil production, transportation refining in the Caspian sea. A big portion of preventive measures is implemented through international agreements, and also at the national scale.

1.2.1. Tendencies of biodiversity decrease

Tendencies of biodiversity decrease in Turkmenistan occupy specific place among major environmental problems of the present. This is why maintenance and supporting of the national biodiversity is put forward as important criteria of the sustainable development of Turkmenistan. In spite of intensive efforts applied during last years, many species of flora and fauna of Turkmenistan have disappeared, before a human being has evaluated and provided sustainable management of biological resources and their use. As of today, populations of such species as small Amudarya spade-nose fish, Kugitang blind trout *(Nemacheilus starostini)*, marble teal *(Anas angustirostris)*, Pallas' sea eagle *(Haliaeetus leocoryphus)*, Caspian snowcock *(Tetraogallus caspius)*, and many others are of very little number. The loss of genetic diversity is observed among sturgeon fishes *(beluga, Russian sturgeon, starred sturgeon)* and Caspian seal. Little quantity of front-Asian leopard negatively impacts the environmental functions of the whole biota, thus influencing biodiversity in wide sense through "domino effect".

Rapidly decreasing is the quantity of all three kinds of ureal *(Ovis vignei)*, being heavily pressed by a man. The number of Kopetdag ram in Kopetdag mountains *(O.v. varentsovi)* by the end of the XX century was 2,500-2,800 units, ustyurt ram *((O.v.arcal)* – 1000-1100, and bukhara ureal *(O.v. bokhariensis)* in the foothills of Koytendag – 80-100 units (Lukarevsky and others, 2001). Due to exhaustion of the nutritive base *(decrease of the amount of mountain goats and rams)*, there is a real danger of loss of birds of prey – forest aid-creatures. Certain previously migrated to Kopetdag Iranian kinds of vegetation, are absent in its flora today: gold-eared locoweed *(Astragalus chrysostachys)* and kuchan locoweed *(A. kucanensis)*, kossinski dionisia *(Dionissia kossinskyi)*, medlar *(Maspilis germanica)*, etc.

Especially evident is the tendency of species diversity and quantity reduction among many groups of waterfowls of the Turkmen Caspian sea coast. The tendency of decrease in common abundance of birds at wintering for the period 1996-2004 was observed: from 424147 to 147119 units (Vasilyev, Rustamov, Milyutina, Belousove, 2007). However accounting of birds in January 2007 registered the reverse tendency of a number increase – 439779 individuals related to 41 species (Rustamov, Scherbina, Guychgeldiyev, 2007). At the background of decline of wintering conditions in the north, and presence of dried-up sites in the south, the environmental conditions for birds in the system of bays of Turkmenbashi part of Hazar reserve became considerably better. The former shallow water areas and even dry plots were filled up with water; Dagata peninsular became the island. A few dozens of thousands hectares added to the water surface of Balhan bay. This area can be regarded as the eastern buffer zone of Hazar reserve. At present 55-60% (previously not more than 50%) of the total amount of birds coming to our sea sector are wintering in this zone.

Agrocoenosis is also losing many kinds of useful species due to the increase of the field pesticide loads. The crisis of entomofauna biodiversity in the conditions of developing desertification leads to the disturbances in natural connections balance, thus producing new vermin and outbursts of their mass reproduction. Of no fewer specifics for Turkmenistan is the role of underground waters, as a variety of fresh-water ecosystem forming flora and fauna composition of the mountain very deserted region.

The main tendencies of the biodiversity reduction are clearly reflected in the Red Data Book of Turkmenistan (1999). 261 species (152 animals and 109 plants) are registered as critically endangered or having the "rare" status, among them vertebrates prevail quantitatively (107 species). The I category species of the Red Data Book of Turkmenistan – endangered or under the threat of disappearance, includes 17 species of animals and 28 plants. Part of specimens of 135 kinds of animals and 71 plants (or 78,9% of the total number) are protected on the territories of existing reserves and sanctuaries. Previously, the IUCN Red List comprised 82 kinds of flora and fauna of Turkmenistan, protected at PA territories (formerly 26 of them were not included into the Red Data Book of Turkmenistan). 119 species of fauna (insects – 7, whelks -1, actinopterygian fishes - 22, reptiles – 4, mammals – 62, birds – 23) are enrolled into the last edition of the IUCN International Red List (2007).Flora is represented only by 11 endangered arboreal kinds of plants of Turkmenistan *(bukhara almonds, bristled kandym, Paletski kandym, walnuts, esa Caucasian, fig, pistachio real, grey-leaf poplar, pomegranate and Androsov tamarisk, Sivers apple-tree Turkmen sub-species).*

The main nationally recognized indicators of preservation of species in their natural habitats are: enhancement of the protected areas managements system, sustainable use of the most important ecosystems, preservation of rare and endangered species and increase of the role of local population in protected areas management (Monitoring and assessment …, 2008). Protection of the world and national biodiversity in the country shall be done by supporting of harmonic use of natural ecosystems and social-economic development of local communities' capacity.

1.2.2. Tendencies of habitats decrease

Destruction of habitats by a human being is at the first place among those factors conditioning vanishing and decrease in number of different kinds of flora and fauna. This is caused both, by anthropogenic *(overgrazing, wood cuttings, virgin land ploughing, road construction, mining activities)* and natural reasons *(elevation of sea level, global climate warming, acid rains, toxic substances emissions into atmosphere and soil, natural disasters, drought, etc).* Destruction of habitats resulting from the human activities, especially annihilation of mountain, desert and tugai forests entails the most damaging consequences.

Really, during the last century the natural ecosystems of Turkmenistan have considerably been transformed, or, as for example the water area of the Caspian sea, suffered strong pollution. This is caused by the increasing demands of population in foodstuffs, fresh water and timber. For example, the progressing land degradation process of different forms affected 91,4% of the total area of Turkmenistan, including degradation of the vegetation cover (74,9 of the area) of all ecosystems that are quite resistant to stabilization (Assessment of capacity for implementation of the UN global economic conventions. Thematic reviews, 2006). The leading mountain ecosystems *(juniper forests and mountain steppes)* are partially degraded, or are being used without rehabilitation, until complete deterioration. The shrub-grassy pastures of the Karakum desert are gradually displaced by wormwood and grass

communities. At the same time, gasification of the major part of the territory of Turkmenistan decreased logging amount consumed by population for fuelling purposes that promoted the process of sands overgrowing and partial "moss-covering" of their surfaces. Increase of economic use of the Turkmen coast and East Caspian waters, especially by oil and gas production industry, led to the reduction of habitats of separate representatives of flora (for example, Eichwald sand acacia – *Ammodendron eichwaldii,* registered in the Red Data Book of Turkmenistan) and fauna, especially among waterfowls.

Non-regulated grazing and pasture over-loadings in the mountain and plain territory have resulted in soil compaction and washout, surface flow and decrease of ground moisture. This has activated the process of desertification of the whole territory in general. Reduction of juniper (archa) light forest areas became one of many reasons of the problem of habitats decrease for many species of flora and fauna. Solution of degradation problems of the Central Asia mountain ecosystems has found reflection in the Sub-regional Strategy on sustainable region development.

Each measure on preservation of biodiversity components habitats is closely interlaced with actions within the framework of the National environmental action program, NEAP and Environment impact assessment standards (EIA), that directly or indirectly are aimed at mitigation of the vegetation cover degradation process.

1.2.3. Tendencies of alien species invasion

The alien species invasion is deservingly considered to be the third by value threat to biodiversity. The problem of alien species immigration and biological pollution is of considerable importance for Turkmenistan, because they are definitely damaging agriculture, forestry and fishery. Today dozens of species-invaders of animal and vegetative origin are moving around the country's territory, and many of them are capable of leading to the most serious environmental, social and economic consequences.

The first list of key alien species of adventive fauna is prepared in the country: 25 species of vertebrate and 32 invertebrate animals, invasive nature of which is revealed in 24 species (Kamahina, Annachariyeva, 2008). The list is a component of the Global invasion species register. From the birds, especially aggressive is the Indian starling *(Acridotheres tristis)* and ringdove *(Streptopelia decaocto decaocto),* fishes – Korean sawbelly *(Hemiculter leucisculus),* Amur false gudgeon *(Abbotina rivularis),* spotted bitterling *(Rhodeus ocellatus),* thomback *(Gasterosteus aculeatus),* etc. Invasive nature has also been discovered in barnacle *(Balanus improvisus)* and ctenophora-mnemiopsis *(Mnemiopsis leidyi)* – competitively active hydro-biont displacing marketable kinds of fish. Being the biological pollutant of all Caspian sea system, Ctenophora is considered to be the main reason in reduction of sprat and other fishes landing. However, it is not ruled out that the environmental gap for this invader was formed also due to the excessive fisheries – potential nutrition competitors (NCAP, 2008).

Within the frames of the CEP second phase the investigational program on identification of the species-invaders scale of movement into the Caspian sea and back was started. The investigation results will help to select the most economic measures for this movement control. Invasion species are a serious threat not only for biodiversity of the Caspian sea, but also for its ecosystem functioning. Many invaders have considerably affected plankton; for example the kind of copepods *Acartia tonsa*, invaded in 70-s of the last century, became predominant, and sometimes is the only kind in those places where there were 10-15 cpecies before (TDA CEP. 2007).

Among phytophage insects the most dangerous are the invasions of greenhouse whitefly *(Bemisia tabaci),* melon fruit-fly *(Myiopardalis [Carpomyia] pardalina),* Comstock

mealybug *(Pseudococcus comstocki)*, etc. For many other kinds, invasions become possible with the related environmental changes. Mass blossoming of toxic blue-green algae *(Nodularii spumigena and N. harveyana)*, producing substances that are toxic for a man and a fish, leads to creation of hypoxia zones. Starting from 2004 during summer seasons, local occurrences of mass death of fish were observed *(grey mullet, bullhead)*. This brings one more element of uncertainty into the situation in bio-resources of the Caspian sea (NCAP, 2008).

The adventive fraction of local flora does not exceed 20% of the total composition. Among them 5 naturalized arboreal species can be distinguished, 39 new advent-kinds (brought in), 20 "refugees" from the culture and 646 kinds of "weeds" biota (315 genera, 61 families), which for the period of less than 50 years increased by 31% (Kamahina, 2009). This is related to the presence of free environmental gaps in the cultural plants crops and disturbed habitats. In the territories of the neglected gardens in many valleys of South-Western Kopetdag the running wild is observedof a number of cultural or cultivated species: giant reed *(Arundo donax L.)*, fig *(Ficus carica L.)*, German medlar *(Mespilis germanica L.)*, unabi *(Zizyphus jujube)*, narcissus *(Narcissus lacticolor)*, domestic plum *(Prunus domestica L.)*, pomegranate *(Punica granatum L.)*, common pear *(Pyrus communis L.)*, etc. as an example of re-domestication (Levin, 2008).

Financial resources of the country are not sufficient for implementation of its commitments in regard to the alien species. At present, state control and monitoring are being executed only in relation to the group of quarantine plant disease-producing factors, plant and products of vegetative origin pests and weeds, forest and agricultural crops vermin insects, and also monitoring of water organisms (mnemiopsis). The country has organizational foundation for execution of activities on alien species study, arrangement wider control of those and monitoring, although specialized structural departments (institutes, laboratories) are absent.

Additional actions (Monitoring and assessment…, 2008) were developed in order to provide control of the main ways of species invasion into the territory of Turkmenistan and to evaluate the risk of reintroduction consequences. This issue is described in the National Caspian Action Plan (NCAP, 2008) and the Third National Report on Implementation of the UN Convention on Biological Diversity (2006).

1.2.4. Tendencies of excessive consumption of natural resources

Excessive use of the gifts of nature is poaching - hunting for foodstuffs provision, gaming and hunting with the purpose of getting of separate organs of the animals used in traditional medicine *(for example, fat of the Caspian seal, or poison of lebetina viper and cobra)* and also illegal commercial gathering of the vegetation raw material. Poaching capture of wild rams, goitered gazelles and argali, including poaching in the protected areas, is also a big problem that has led to the sharp reduction of their number. Overgrazing of natural pastures gave birth to desert-depleted mono-dominant communities, caused transformation of feather/fescue-grass steppes and reduction of the miscellaneous herbs amount, especially among corm species. Fires and non-controlled cutting of saxaul, juniper, etc. for heating purposes have led to disappearance of mountain and desert forests that resulted in soil degradation, development of wind erosion, decrease of water springs, use of forest territories for livestock grazing.

Large-scale exploration of the Caspian natural resources caused their diminishing. Increase rate of disturbances, non-regulated production and high level of water contamination around the whole Caspian sea brought to apparent degradation of the total population of the

Caspian seal, including the Turkmen sector. Sea water pollution increased cow barrenness, thus creating reproduction crisis. In 2000 the cases of mass death of the seal have been registered along the whole Caspian coast, in 2007 – only in the territory of Mangistau region of Kazakhstan (NCAP, 2008). Today the project "Identification and elimination of the Caspian seal threats" (2007-2009) is in operation. Approximately from the end of 2000 the fishing amount of sprat is being decreased in Turkmenistan and neighboring countries (6 tons a day against 20-25 tons a day per sea vessel). Due to the excessive fishing, the resources of sturgeon fishes (beluga and starred sturgeon) continue to decrease. This negatively influences well-being and living standards of all people, regardless of their social status. Poaching fishery amount is at least 10-13 times more than officially permitted fishing quota. The problem of preservation and restoration of sturgeons has acquired special inter-state character as a trans-border problem related to all Caspian countries NCAP. 2007). For the purposes of enhancing activities on fishery management of the Caspian countries (the Republic of Azerbaijan, the Republic of Kazakhstan, the Russian Federation, Turkmenistan and Iran from 2002), the regional Caspian commission on water bio-resources has been established, which together with CITES has conducted the work on identifying the fishing quota and on struggle against illegal sturgeon fishing (TDA, 2007).

The mass capture of waterfowls and near-water birds resources during 1970-2000 has also led to a number decrease of the populations of 40 birds species, i.e. 14,2% of the total number. By the year of 2000 (Vasilyev, 2001) at the south-eastern Caspian coast, such species as common bustard, little bustard, demoiselle crane, small or Bewick's swam, red-breasted goose, red kite have completely disappeared; many others got the status of the endangered species.

In this regard, the small grants program of the project "Sustainable Caspian coastal communities development – Azerbaijan. Kazakhstan, the Russian Federation, Turkmenistan" of the second CEP phase, has secured certain decrease and prevention of the natural resources excessive use and consumption in the Caspian sea region. Alternative local population life support sources (42 projects) were targeted at diminishing of the usage rate of the Caspian sea resources.

The results of the actions on land degradation combating in three regions of Turkmenistan (NAPD, 2002-2005) have showed the real possibility of fixation and forestation of the movable sands in the Central Karakums**,** thus mitigating water erosion effects. The country is also conducting works on elimination of the negative factors of land degradation, preservation and rational use of vegetation resources. A separate program of activities on arid lands adaptation to climate change is being developed.

1.2.5. Tendencies of environmentally insecure oil and natural gas exploration and production

The human economic activities (oil exploration and production), repeated Caspian sea level fluctuations (transgression and regression) and development of landscapes extremely sensitive to desertification processes – caused contamination of the Turkmen part Caspian sea waters, endangering biodiversity. Oil pollutions prevent phytobenthos and phytoplankton of the Caspian sea, reduce oxigen production, pollutants are accumulated in the bottom sediments. Pollution increase negatively impacts the exchange between water surface and atmosphere. Waterfowls, birds and other animals are exposed to the most harmful influence of oil pollution (NCAP, 2008).

Although the exploration rates of oil fields and natural gas have increased, as well as transportation, direct consequences from the fields development in the form of oil spills or detection of new reserves have not arisen yet, and influence on environment considerably decreases. Recently the contents of oil products and phenols in the sea environment has decreased. If in 1988 according to the report of State Nature Committee of the USSR (Moscow, 1989) the numbers showed 2-3 maximum concentration limits (MCL) on oil products and on phenols 4-6 MCL, today (2006) correspondingly - 1,4 and 3 MCL.Within permissible limit are concentrations of such pollutants as heavy metals which act on the background of the oxygen and biogene mode norm. Pollution of atmospheric air was identified by presence of 4,2 MCL of sulphur dioxide, 1,5MCL of nitrogene dioxide and 1,3 MCL of dust (Kurbanova, 2008).

The further intensification of hydrocarbons production and development of commercial marine fleet with its infrastructure will lead to te economic potential growth and expansion of environmental problems. Therefore Turkmenistan, being concerned by threats that endanger genetic resources, actively participates in the work of the Caspian environmental program (CEP) within the frames of which NCAP (2008) and TDA (2007) are developed - the Protocol on biodiversity is at the stage of completion. NCAP provides the list of actions and processes which have adverse influence on deep-water ecosystems and species. Actions of the Transboundary diagnostic analysis, the Strategic actions program and national sectoral plans are targeted at regulation of adverse influence on deep-water ecosystems and species and on perfection of implementation of the sea and coastal areas complex regulation. Monitoring of transboundary resistant toxic substances, including resistant organic pollutants, oil products and heavy metals pollution is carried out in the country.

Biodiversity protection is one of priority directions of the «Frame Convention on protection of the Caspian sea environment» (2006). Article 14 (e) to the Convention describes the measures on protection, preservation and restoration of endemic, rare and endangered species, Article 12 - measures on invasion prevention, control and struggle with invaders.

The EIA standards are applied in the country; and the regional consultative group on biodiversity and alien species is operating, and also the regional «Strategy and action plan» (2004, GEF). The undertaken actions enable the countries-participants of the near-Caspian states (Russia, Kazakhstan, Azerbaijan, Iran and Turkmenistan) to resolve separate national problems on sustainable management of the fish economy and all its bio-resources. The key target on sustainable use of bio-resources is included in NEAP and BSAP.

1.2.6. Tendencies of global climate change

Turkmenistan is related to the regions, where the problem of climate change and its influence on the biodiversity structure is regarded a necessary condition for providing of welfare and health of the population, and also national security. Taxonomic composition of national biodiversity and ecosystems sustainability considerably depend on global climate change. Although the target task on biodiversity load reduction caused by climate change was not included into NEAP and BSAP, the search for control indicators of the climate change consequences (and their impact) on the biodiversity components is very important for the country.

Within the frames of the Global concept of environmental safety, the territory of Turkmenistan in the Central Asian region is regarded as a component of the common interstate system of the environment monitoring (2004-2015). If before, during implementation of the UN FCCC First national report this problem was only partially touched upon on the agrarian sector level, in the Second report (2006-2009) it is separated into the block “Biodiversity and climate change”. It deals with the forms of biodiversity adaptation in

the conditions of observing and forecasted consequences of climate change. In 2008 the regional seminar of the Central Asian countries on the problem of climate change, including the problems of adaptation was held. It is planned to hold a Conference of the ministers of environment protection of Asian-Pacific region countries on the same problem in 2012.

Investigation of assessment of vulnerability and adaptation to climate change of agro-biodiversity components *(cotton, wheat and Lucerne)* enabled to develop the Package of recommendations within the National Action Plan on implementation of actions leading to reduction of the greenhouse gases emissions. The climatic shifts *(first of all, autumn-winter draughts)* in the territory of Turkmenistan may lead to the considerable disproportion of heat and moisture. And this will promote crop capacity decrease and mass drying-out of shrubs, semi-shrubs and perennial grasses. Probability of extinction of species with the certain demands to habitats *(tugai arboreal-shrubby vegetation, relict kinds of trees and separate families)* will be increased. The process of expansion of "weed" kinds, well adapted to setting in new places, as the goosefoot family and also succulent plants and haliphytes will be activated.

Climate change may also result in critical changes of natural habitats areas, fragmentation of their ranges and in reorganization of landscapes. The process of alien species expansion will become stronger; many of them may expose invasive nature. The shift of some certain kinds of animals range borders to the north is probable, the others – environmental shifts, or change of wintering places. Decrease of water sources quantity will reduce the amount of many mammal species. The amount of plankton can also be reduced, negatively influencing composition of marine kinds of birds and fishes.

This is why, it is very important for Turkmenistan to start the process of projects implementation on mitigation of the climate change consequences and adaptation to those. The projects should also deal with the issues of preservation and sustainable use of biodiversity in the conditions of desert communities advancing behind the limits of climatically defined borders. The cross-assessment of the three international conventions capacity (CBD, CBO and FCCC) made it possible to identify resources needed to support and increase resistance of the biodiversity components to climatic changes (Assessment of capacity… Thematic reports, 2006).

A new version of the national *Strategy on biodiversity preservation* can also serve as the supporting mechanism, aimed at increase of resistibility of biodiversity components to climate change. In the conditions of global warming, expansion of the protected areas (PA) network is not sufficient for solving the problem of sustainable use of natural resources. Transition is required from the monitoring program on species level to the program of ecosystem approach that was actually fixed in the decision of the Seventh meeting of conference of CBD parties. Taxonomic initiatives, cultural traditional knowledge related to biodiversity preservation and regulation of quantity of the invasive (alien) kinds, capable of threatening separate species and ecosystems habitats (for example, moving into the territory of Turkmenistan of the new kinds of mosquito – decease-carriers) should be the priorities of the new Strategy version.

1.3. Impact of changes in biodiversity state

The CBD Global initiative according to ecosystems assessment, has concentrated attention on interrelation between the services of ecosystems and well-being of people, between their changes and mankind development as a whole, paying special attention to influence of the changes in biodiversity state to well-being of people in definite district. For ecosystems management enhancement and, accordingly, for the contribution to well-being of

people and poverty decrease, identification of policy at local, national or global level is important.

Special attention in CBD is paid to «sustainable regulation of agriculture biodiversity by forces of farmers and their communities». The legislation existing in the country provides execution of main provisions of the international environmental agreements, although the mechanism of their implementation is not always described. Not all accepted international obligations find reflection in the existing environmental legal space. In particular, there are no legal norms in the country on protection of the rights of farmers on access to genetic resources, on material and technical support from the government, on privileges, on equal for participation in benefits sharing, etc. (Article 8j and Article 19 of CBD). In this regard it is important for Turkmenistan to become the party of the multilateral system of access and distribution of benefits, established by the International FAO agreement dated 03.11.2001. Among the big list of food and bean forage crops (95 species) covered by the multilateral FAO system, 64 kinds (or about 70 %) grow in the territory of Turkmenistan.

With a view of support of efforts of farmers on preservation of vegetative genetic resources in their fields, the list of local Turkmen species and forms of wild fruit crops and grapes, collected in the live collection of MSPCPGR is made. This is the first step in the country to prevention of genetic erosion of food fruit crops, directing the researcher to search of local forms in-situ. It will enable the farmers to expand the range of genetic variety used. For this purpose it is necessary, that in the national legislation there should be a preliminary justified consent (the frame document) about access to genetic resources and distribution of benefits.

Understanding by everyone that well-being of a family as the society cell, depends very much on a wildlife condition is important. Preservation of elements of the nature can act and as a way of gaining additional profit. For example, for the purpose of increase of local population significance in PA management in Sumbar valley of Mahtumkuli etrap (Southwest Kopetdag), from 2000 works the system of compensation for the damage to local population from attack of leopard on livestock. The insurance herd (200 units of sheep) is formed near Mahtumkala village and Council of local community of livestock-owners association is elected. For today the flock number has increased (about 600 sheep), long-term strategy and action plan on leopard preservation operates. Besides, since 2005 the agreement is concluded between administrations of “Turkmenmallary” Association and Kopetdag, Syunt-Hasardag and Badhyz reserves of the Ministry of Nature Protection, permitting seasonal grazing of livestock in the territory of the sanctuaries of these reserves.

Practice has shown that small mitigation of social and economic living conditions of local population of the East coast of the Caspian sea implemented within CEP framework, succeeded in positive life changes, having directed efforts to decrease in reduction of populations of rare species of fishes and near-water kinds of birds. It is known that local communities suffer from reduction of fish stocks. Absence of conditions for spawning of fishes in Etrek river against deficiency of corresponding (alternative) social village infrastructure was complicated by conditions of local population survival. The program of small grants developed within the frames of CEP project enabled local communities to develop alternative and sustainable sources of their life-support. As a result, the local community of Etrek etrap has arranged the olive oil manufacture. In Karabogazgol a small poultry farm, in Hazar - cattle-breeding has been constructed. People have gained experience on development of alternative, sustainable source of life-support, having understood how to come to economic revival of region in the conditions of the reduced influence on local natural resources.

For the health protection of population, the legal security of genetically modified food products is necessary. Enhancement of juridical mechanism will provide security of genetic resources and will create legal environment for increasing possibilities of the farmers and local population in in-situ/on-farm preservation of the local kinds of fruit crops and their wild relatives. In the nearest future it will promote forming the legitimate space capable to adequately react on genetic resources preservation and their rational use.

CHAPTER II. CURRENT POSITION IN IMPLEMENTATION OF BIODIVERSITY STRATEGY AND ACTION PLAN OF TURKMENISTAN

The Ministry of Nature Protection of Turkmenistan, together with UNDP prepared and published two documents in Russian, Turkmen and English languages: "Turkmenistan. State of Biological Diversity. Review" (2002) and "Biodiversity Strategy and Action Plan of Turkmenistan" (BSAP, 2002). The review became the first national report of the country to the Convention. The problem of biodiversity reduction is included into the "National Action Plan of the President of Turkmenistan on Environment Protection" (NEAP, 2002) as one of the priority national environmental tasks.

The structure of national BSAP is aimed at implementation of the main Convention targets: preservation of biological diversity, sustainable use of its components, fair and equal right distribution of benefits in using genetic resources. The problem of biodiversity reduction is included into the "National Action Plan of the President of Turkmenistan on Environment Protection" (NEAP, 2002) and Protocol on Biodiversity to Frame Convention on Protection of Marine Environment of the Caspian Sea (2008).

2.1. BSAP priority actions

In Turkmenistan BSAP the national target is established – *to preserve, restore and rationally use biological diversity of the country for the present and the future generations*. 12 national target tasks which have enabled the country to clarify the global target for the period till 2010 according to the adopted decisions of the Parties Conference and Convention Secretariat are identified.

BSAP main targets

1. Achievement of integration of planning of actions for biodiversity preservation at all levels of the governmental programs by 2005.

2. Revision and development of nature protection laws in accordance with CBD for elimination of gaps in the legislation by the end of 2006.

3. Decrease by the end of 2007 by 20 % of relative level of environmental contamination on the basis of revision and improvement of the nature protection legislation and technologies.

4. Suspension by the end of 2010 of process of degradation of natural landscapes on 30 % of their territory.

5. Preservation of current state of large forests and restoration of 5% of their area by the end of 2010.

6. Improvement of knowledge of the population on the value of biodiversity by 50 % and raising by 10 % of level of their environmental education by the end of 2007.

7. Expansion of network of protected areas to 6 % by the end of 2008 and maintenance of their efficient management.

8. Improvement of preservation of agro-biodiversity and natural genetic fund in ex-situ habitats by 30 % by the end of 2008.

9. Development and implementation by 2010 of the methods of economic incentives for raising of level of local population interest in biodiversity preservation.

10. Securing of internal and external investments for BSAP projects for the whole period of their implementation.

11. 30% increase of investments for maintenance of scientific capacity of the institutions dealing with the problems of biodiversity by the end of 2010.

12. Development by 2006 of the biological resources management plan for decrease in their overrunning; and implementation of this plan.

55 actions and 253 activities have been planned, which were distributed within the limits of 14 strategic components *(target tasks),* showing how the key target and 12 main targets will be achieved. The issues of the Articles 6-20 of CBD are clearly presented within the frames of the strategic components. Implementation of the Strategic plan is focused on decrease of the existing rates of Turkmenistan biodiversity loss. Each target task has reflected the related Convention article and is aimed at solution of the specific programs at sector level.

The level of correspondence of main CBD articles to strategic components *(or target tasks)* of BSAP and completion rate (%) of BSAP activities for the period 2002-2008.

A. In-situ preservation (8 actions, 44 activities) – conforms to the CBD article 8) in-situ preservation). The most priority measures on preservation of species in their habitats – improvement of the system of protected areas; preservation of rare and endangered species of animals; preservation of migration corridors (in-situ) – have already achieved partial progress. Executed 11,1% of all BSAP activities.

B. Preservation ex-situ (6 actions, 18 activities) – corresponds to the CBD article 9 (preservation ex-situ). Preservation outside of the habitat (collections, botanical garden, nurseries) shall be considered as support to in-situ preservation. Executed 4,6% of all BSAP activities.

C. Sustainable use of biological and landscape diversity (5 actions, 23 activities) – corresponds to the CBD articles 6 (common measures on preservation and sustainable use) and 10 (sustainable use of the biodiversity components). With mechanism of sustainable use,

the process of biodiversity preservation is closely connected with the needs of the local population. Executed 3,8% of all BSAP activities.

D. Institutional capacity development and training (3 actions, 12 activities) – conforms to the CBD article 12 (investigation and training). The priorities were identified in the country in establishing capacity, its main tasks were identified, and supportive activities were implemented aimed at analysis and assessment of the capacity for biodiversity preservation at three levels: system, institutional and individual. Executed 3,1% of all BSAP activities.

E. Environmental education and public participation (6 actions, 32 activities) – corresponds to the CBD article 13 (public awareness and education). Public awareness laid down the basis of all implemented nature protection activities that took place outside of protected areas. The environmental education process was connected with wide involvement of public into environment protection activities. Executed 4,8% of all BSAP activities.

F. Identification and monitoring (4 actions, 26 activities) – corresponds to the CBD article 7 (identification and monitoring). Establishing in the country of the mediation mechanism (CHM) enabled to create foundation for implementation of activities aimed at development of the biodiversity monitoring system Executed 4,9% of all BSAP activities.

G. Researches (4 actions, 19 activities) – corresponds to the CBD article 12 (researches and training). Permanent study of biological system by the research centers, environmental and nature protection services has laid down a basis of reorganization of their management practice. The country preserved the infrastructure of national taxonomic collections, supporting activities on strengthening of taxonomic capacity are necessary. Executed 4,0 % of all BSAP actions.

H. Exchange and access to information (3 actions, 10 activities) – corresponds to the CBD article 17 (information interchange). For effective work on exchange and availability of the information to public, the CHM Center establishment is planned, as the information exchange mechanism on implementation of CBD. It is executed 2,3 % from all BSAP actions.

I. Cooperation (technical, scientific, interstate transfer of technologies) - (2 actions, 13 activities) – corresponds to the CBD article 18 (technical and scientific cooperation). Rates of regional and international cooperation considerably outrun the process of interdepartmental cooperation. It is executed 1,8 % of all BSAP actions.

J. Impact assessment (2 actions, 8 activities) – corresponds to the CBD article 14 (impact assessment and minimizing of undesirable effects). Though amendments of specific influence on biodiversity (J.1.2.) are not entered into the national EIA standards, in the country on a design stage the assessment of impact on environment of the units under construction is being carried out. It is executed 0,9 % from all planned BSAP aimed at on reduction of negative factors of impact on biodiversity.

K. Incentives measures (6 actions, 9 activities). – corresponds to the CBD articles 11 (stimulation measures) and 19 (implementation of biotechnologies and distribution of the related benefits). The country started the process of rendering of economic assistance to farms and carrying out of the economic assessment connected with consumption of natural resources is planned. The complex of works aimed at increase of possibilities of farmers and

local population in preservation on places in-situ/on-farm of local kinds of fruit crops and their wild relatives is being done. It is executed 1,7 % from all BSAP actions.

L. Legislation (3 actions, 14 activities) – corresponds to the CBD articles 15 (access to genetic resources) and 16 (access and transfer of technologies). The process of harmonization of the national legislation has begun, which is not supported yet by adoption of new laws that can provide effective support of the planned activities. It is executed 1,8 % from all BSAP actions.

M. Financial sources (3 actions, 13 activities) – correspond to the CBD article 20 (financial resources). Plan implementation is carried out on the state budgetary funds and the funds of the international donors. It is executed 2,4 % from all BSAP actions.

N. Coordination and monitoring of BSAP (3 actions, 11 activities) – corresponds to the questions presented in articles 6 to 20 of CBD, and is supported by administrative and management structure inside of the plan itself. It is executed 1,8 % from all BSAP actions.

2.2. Target tasks and indicators of BSAP

National BSAP as the state document, has been confirmed by the State commission on fulfilling of obligations of Turkmenistan following from conventions and programs of the United Nations on environment, but legislatively has not been confirmed by the head of the state and has not been accepted for management and implementation by national economy sectors.

At CP-7 which took place in Malaysia in 2004, that is in two years after establishing of the national BSAP, the priority in progress definition on execution of decisions and work programs of the Convention, monitoring and system of indicators had been selected. BSAP comprises 12 main targets which accurately enough reflect the global target of CBD. National indicators have been presented only as results, as «criteria of estimation of success or definition of degree of completeness of the given kind of activity». Unfortunately, these national indicators poorly meet the indicators of the global CBD programs and demand corresponding completion.

2.3. Contribution of BSAP measures to implementation of Convention articles, thematic programs and prevailing questions

For the estimation of progress in achievement of the CP-7 target outlined for 2010 on decrease of the rate of biodiversity loss at the national level, the review of implementation of the Convention targets through assessment of effectiveness of execution of its Strategy plan was conducted in the country. The target tasks (strategy components) in the analytic report *"Monitoring and assessment of effectiveness of biodiversity strategy and action plan implementation"* (2008) act as main elements of control, which were grouped into the next five sets:

1. Preservation of species and their sustainable use (A+B+C): A and B – preservation of species in-situ and ex-situ; C – sustainable use of biological and landscape diversity – executed 19,5% of the planned BSAP activities;

2. Adequate environment (I+J+L+M): I – cooperation (technical, scientific, interstate technologies transfer); J – assessment of the economy sectors impact on biodiversity; L – legislation; M – financial sources - executed 6,9% of the planned BSAP activities;

3. Information/education (D+E+H+K); D – institutional capacity development and training; E – environmental education and public participation; H – exchange and access to information; K – incentive measures; - executed 11,9% of the planned BSAP activities;

4. Monitoring (F+G); F – identification and monitoring; G – research - executed 8,9% of the planned BSAP activities;

5. Management (N): n – introducing coordination and BSAP monitoring - executed 1,8% of the planned BSAP activities;

Study of the course of implementation of the national Strategy plan for the intermediary period (2002-2008) showed, that the country has actuated its activity, mainly, on preservation of species and their sustainable use (19,5% of implementation), and to the considerably less degree on training/professional development (11,9%) and monitoring (8,9%). In limited amount presented measures aimed at creation of favorable environment, i.e. solving of problems of cooperation (1,8%), assessing the economy sectors' impact on biodiversity (0,9%) at the background of legal issues reformation (1,8%) and search for financial sources (2,4%). Relatively low cost-based effectiveness of BSAP implementation is also conditioned by partial implementation of activities on management (1,8%). The informational center on BSAP implementation, analogue of CHM center is absent in the country (Monitoring and effectiveness assessment…, 2008).

In spite of all gaps, the country during the period of 2002-2008 has implemented 49,0% of all planned BSOP activities and is ready to introduce additional measures into the Plan (Supplement II) in the light of implementation of the Conference of the Parties decisions (Monitoring and assessment …, 2008). The rate of implementation of the scheduled BSAP activities allow to think, that the bigger part of target tasks, except the group of activities on adequate environment, can be implemented, although not always in full amount, by the year of 2010. For enhancement of the BSAP activities contribution in implementation of the Convention articles, 23 priority measures to the existing strategy plan have been developed. These activities have been discussed at the velayat (regional) seminars and at the round-table meeting with involvement of local public that enabled to considerably improve the existing strategy plan.

The indicator of achievement of the CBD Global target in Turkmenistan could be the renewed variant of the national Red Data Book (third edition), which could register certain amount of species with changed status – against common decrease of the quantity of species enrolled into this Book, as an indicator of decrease of threat factors. The indicators of sustainable use are developed for the Central Asian region countries. Endangered species, their quantity, and also general factor of the fauna and flora specific wealth act as the indicator of biodiversity state on the species level. The environmental monitoring factors are indexes and species diversity models. Quantity of the reserves and sanctuaries and their area, and also total PA area in percentage to the area of the country's territory are the response indicators.

Process of implementation of the BSAP activities, undoubtedly, has rendered positive changes on biodiversity, having improved condition not only of its separate components, but also has changed the relation of the population to them. For the first time in one edition the

multi-plan information on biodiversity, aimed at capacity support and enhancement has been presented that as a result became the country contribution to implementation of CBD. The CBD material became demanded not only by local users of resources, but also by the persons, making decisions and providing sustainable use and management of natural resources. Therefore "injections" of financial assets both from internal, and from the international sources, have reached certain successes, and what is more important – they promoted attraction of a wide range of consumers to understanding of importance and value of biodiversity on a way of implementation of the Convention.

Implementation of scheduled BSAP activities promoted elimination or mitigation of the separate threats endangering biodiversity. Apparently, inclusion of economic levers in process of decrease in loading on biodiversity, and adequate financing of actions that will raise efficiency of realization of BSAP itself is necessary. In the updated GEF-5 rules adopted at CP-9, it is underlined that those priority projects for the country which are included in national BSAP are financed, stressing thereby the importance of this document.

2.4. Brief review of progress priority activities implementation

Assessment of implementation efficiency of the national strategy and action plan on biodiversity preservation (Monitoring and assessment …, 2008) for the intermediate period (2000-2007) has shown certain progress in realization of CBD articles and decisions of the Conference of the Parties (CP–6, CP–7 and CP–8). The assessment of local agro-biodiversity state has revealed activation of processes of genetic agro-biodiversity preservation in farms. At the same time, it has shown the necessity of assessing the status of biodiversity in agricultural territories. When activating the process of attraction of the international cooperation means to maintenance of economic viability of agricultural ecosystems, rich in biological and landscape diversity, the country can provide integration of biodiversity interests into the agricultural sector in practice.

Progressing processes of dry and sub-humid lands degradation (desertification) have complicated country possibilities to provide sustainable use of ecosystems and bio-resources. Within the frame of the regional program «The Initiative of the countries of the Central Asia on land resources management» which general concept coincides in general with the NEAP targets, investments for implementation of projects on rational use, restoration and prevention of land degradation are secured. The key target of this initiative is combating degradation of land and improvement of well-being of agricultural population in the region countries.

The first work experience *(«Preservation and sustainable use of global value biodiversity in Hazar reserve at the Caspian sea coast», (2006-2010)* has shown that by means of strengthening of sustainability of the national system of protected areas, development of inter-departmental cooperation of organizations located in a coastal zone of the Caspian sea, and local population support, it is possible to provide biodiversity preservation on a global scale. Demonstration of the adaptive approach to preservation and management in Hazar national reserve with the subsequent duplication in the whole system of protected territories of Turkmenistan will enable not only to enhance interdepartmental capacity, but will also provide the integrated coastal management aimed at preservation of biological diversity.

Engagement of economic levers of influence aimed at decrease of pollution, rational wildlife management, encouragement of "pure technologies», will lead to preservation of stocks of sturgeon fishes in the Caspian sea. Artificial commercial cultivation of sturgeon in Kiyanly village of Balkan velayat will promote production of sturgeon food goods, including

caviar. The facility activity is aimed at preservation of valuable kinds of fishes by means of sustainable reproduction. After formation of female and mate school, they will come to the young of fish sturgeon cultivation (beluga, Russian sturgeon, starred sturgeon) for fish replenishment of the Caspian sea.

A number of the investment projects intended for updating of available material and technical resources, use of modern technologies, establishment of environmentally-friendly and safe production, and also creation of new workplaces for local population has served as a new impulse in development of fishery activities of Balkan velayat in the economy of Turkmenistan. Creation of alternative sources of life-support of local population has enabled to reduce the amount of natural resources use of the Caspian sea. Establishment of management system in accordance with eco-system principles, with due regard of the interests of local communities and environment, is important for modern economic calculations of the further sustainable development of the region and its biodiversity.

The problem of enhancement of the system of protected areas management in Turkmenistan was considered during ECONET projecting for long-term biodiversity preservation in the Central Asia. In the course of work territories of the regulated wildlife management are revealed. It includes 18 knots of environmental carcass (50 % of the area of the countries) — valuable from the point of view of biodiversity, natural sites, half of which are operating reserves representing "cores" of environmental skeleton. Besides, protected natural territories with a special mode of use and protection are identified. Natural corridors *(transit territories)* — valleys of the rivers and coast of Caspian sea, are presented by fragmented complexes, altogether providing continuity of environmental space. The “ECONET” structure basis has served as a foundation for the Protocol on biodiversity preservation of the Frame Convention on preservation of the environment for sustainable development of the Central Asia (2006).

«The long-term plan of development of a network of especially protected natural areas of Turkmenistan» in which the future of PAs is - modernized territories with different mode of protection *(permanent and temporary),* where the zoning principle would be combined with inclusion of sites of environmental restoration is developed. The national park *(the second category of IUCN)* will be a basic element of nature protection activity in our country. Existing reserves *(the first category of IUCN)* will become its basis. The area of these territories in future will make 30,8 % of the country area. Environmental and economic justification has been developed for creation in Mahtumkuli etrap of Balkan velayat of Sumbar national park, and in Ahal velayat – Archabil national park. For mountain regions creation of environmental corridors between future national parks (Archabil and Sumbar) with soft forms of the regulated wildlife management and, on the contrary, – creation of new PAs of high nature protection rank in droughty ecosystems seems to be the most actual in the nearest future.

The Ministry of Nature Protection has prepared Substantiations *(a set of documents)* for establishing of Balhan - in the mountains and in the desert – of the Central-Karakum reserves. Within the frame of implementation of requirements of the Convention on World natural and cultural heritage (1994), the Representation of World Wildife Fund (WWF) in Turkmenistan together with MNP developed a set of documents on nominating of Badhyz, Repetek, Syunt-Hasardag and Koytendag reserves for the status of "units of the world natural heritage of UNESCO». The electronic illustrated Catalogue of nature protection units *(landscape, botanical, zoological, water, geological and paleontologic)* of Southwest Kopetdag has included 81 of 104 nominees on the "the nature monument" status, supported by 800 photos. The most complete information on reserves of Turkmenistan is published in the collection «Reserves of Central Asia and Kazakhstan» (2006); addressed: (http://iucnca.ne).

Measures on further enhancement of legislative, legal base for regulation of nature protection activity in this regard are provided for. Offers on enhancement of the law "About the state specially protected natural areas" are made: it is offered to put into circulation such concepts as "national park" and "biospheric reservation". This, in turn, will demand development and approval of the corresponding typical provisions providing interaction of protected zones with adjoining territories, development of approaches and restrictions to certain kinds of activity for the period of migration of animals, etc.

The species included in the Red Data Book of Turkmenistan are protected by country laws, customs rules, and other standard documents, however their value is not that great, and development of the special legislative measures aimed at restoration of their number is necessary.

MNP together with WWF on the basis of Badhyz, Syunt-Hasardag and Amudarya national reserves are implementing projects on preservation of koulan, leopard and red deer. The software and uniform computer format on conducting the program of the reserves' "Nature Chronicles» are developed and methodical instructions on conducting effective monitoring are prepared. Five years' intermediate term management plans *(management-plan)* of Repetek, Amudarya and Syunt-Hasardag national reserves are developed. The concept of the regional ECONET has been integrated into the Frame convention on preservation of the environment for sustainable development of the Central Asia (2005).

In the territory of Turkmenistan (2005-2008) 50 International key ornithological territories (COT) are identified and described, covering all natural ecosystems of the country and occupying 7 % of its area, third of which (32 %) are connected with PA to different extent. Almost half of the Turkmen COT territory is inhabited by the communities limited by one biome, the major part of which (60 %) is suitable for waterfowl and near-water and-or terrestrial kinds of birds live. The destiny of 17 species of birds causes a global scale concern: three kinds critically endangered; 2 - disappearing, 8 - vulnerable and 4 - close to the endangered. Results of works have served as a substantiation for improvement of operating system of protected areas and carrying out in their territory of monitoring researches within the frame of the developed Strategy on preservation of birds species in COT territory (2008-2010). The steady theoretical base for development and implementation of the national program on protected areas is generated in the country and the directory «Key ornithological territories of Turkmenistan» which will be published in the middle of 2009 is prepared

Environmental tourism (ecotourism), aimed at preservation of biological and landscape diversity of protected areas can be an example of sustainable use of ecosystems of specially protected natural territories, capable of providing the goods and services and means of existence to local population. In the country started The project «Support to activities of the country for implementation of the Program of CBD work on protected territories» has begun in the country, intended for the development of Strategy on environmental tourism and enhancement of national PA system through implementation of economic assessment of natural resources. Working out of legislative documents will enable to activate participation of the local population in granting services to environmental tourism. According to the international technique developed for the World bank and WWF, the process of efficiency management control on for protected territories was started. The seashore territory of the Turkmen Caspian sea sector - "Avaza", since August, 2007 was declared as the first operating free tourist zone. This action will become a long-term basis of fruitful international cooperation and dynamic development of sanatorium and resort infrastructure.

Turkmenistan, starting the process of assessment of consequences of climatic changes for integration of the results into the projects structure, has put a basis for the policy targeted at mitigation of the climate change impacts and adaptation to them. Studying and support of forms of adaptation will allow to consider questions of preservation and sustainable use of

biodiversity of Turkmenistan at the level of a separate species or species group in the conditions of desert communities advancement beyond the limits of climatically defined borders.

The working group *«Enhancement of institutional and legal frameworks for environmental management»* has executed the monitoring analysis of the current legislation and the legal norms related to the management of the reserves territories; and have prepared the collected articles of the existing international and legal nature protection laws. At the regional seminar in Tashkent (10.-14.10.2008), *«Legislation, the mechanism of distribution of benefits from use of genetic resources of plants and protection of the rights of farmers»* special attention was paid to weak level of informing on the rights of farmers. Inadequacy of legislative base to requirements of development of farms has encouraged development of the concept of two interconnected project offers *«About measures on rendering of support to farms on cultivation of local kinds»* and *«About protection of the rights of farmers and the mechanism of distribution of benefits»*. While preparing legal documents, it is necessary to pay attention to the solution of such priority issues, as provision of economic incentives to farmers, creation of commodity market and material and technical support rendering to the local farmers, engaged in cultivation of local breeds and wild-growing kinds of fruit crops and grapes. The process of intensifying of the farmers' activity should pass through enhancement of legislative space, in particular in the field of intellectual property.

Increased cooperation of MNP with the Representation of the World Wildlife Fund (WWF) has resulted in obvious progress in nature protection activities related to rare species in the territories of existing reserves. Starting from 1999, activities aimed at preservation of globally important species (IUCN, 2007) have been executed: leopard in Kopetdag region, the red deer population *(Cervus elaphus bactrianis)* in Amudarya river valley and koulan in Badhyz (Pereladova, 2005, 2006, 2006 b). Assessment of possibility of cheetah *(Acinonyx jubatus)* reintroduction into the boundaries of its historic habitat was made – North-Western Turkmenistan (Ayrakly upland), foothills of East Kopetdag (Meana and Chaacha village) and in Badhyz.

With support of the population and local authorities number of leopard population — vanishing species of Kopetdag (IUCN, 2007) — has increased from 70-75 individuals in 1999 to 85-90 and is now stable *(Lukarevsky, 2003; Pereladova, 2005)*. The method of reintroduction of goitered gazelle to Southwest Kopetdag as an object of leopard nutrition is developed. In Turkmenistan on Ogurchinsky island in the Caspian sea the natural stock population (800–1000 individuals) was created for reintroduction of goitered gazelle into the places of former inhabitance. In the territory of Amudarya reserve and surroundings, activities have been executed on assessment of the present state of red deer population groups and its habitats. Its number has increased from 29-32 individuals in 1996 to 56-65 in 2004 in the territory of Amudarya reserve, in Amudarya water meadows – about 120. Implementation of the *«Action Plan on protection of red deer»* made it possible to establish on the basis of the reserve the center for environmental education and development of environmental tourism in the region. The number of Turkmen koulan population has increased in Badhyz from 200–300 in 1999 to 800-900 units by the end of 2004 that corresponds to the capacity of local pastures.

Results of researches of CEP (2000-2002) have established the reason of mass destruction of the Caspian seal because of the dog distemper virus. Purposeful studying of the age structure of population of a seal, its biological features, number, food structure by the seasons of year, the death rate reason will allow to eliminate by the end of 2009 a certain part of its threats. The control winter aviation account of birds (21–22.01.2007) of the eastern coast of the Caspian sea has revealed the structure of wintering component of birds (300 species), among which - 120 kinds of wetlands complex. The «Field identifier of the birds of

Turkmenistan» (407 species of birds) is prepared for publishing. New data on distribution, number, systematization, biology of reproduction and migratory activity of big and small-nose Amudarya spade-nose fish are received.

During the long period (1965-1990) of over-consumption of poison of the Central Asian cobra — a species included in the Red list of IUCN (2007), and lebetina viper, a number of these species on all area, especially in Kopetdag, has considerably decreased. Prohibition of export of snakes from the country and closing of three serpentariums promoted creation of favorable conditions for restoration of populations of these kinds of snakes within the area. Preconditions to current situation improvement in the nearest future are observed. According to herpetologists' data, a number of cobra and lebetina viper has increased approximately by 2 times, and it is necessary to note that this has not required the governmental subsidies and donors funds. Considerable increase in number is noted in Murghab river and Karakum canal valleys, and also in Kopetdag mountains. During 42 excursions in the Central Kopetdag (Hindivar mountain) 38 cobras were counted; lebetina viper accordingly – 68 days and 69 individuals. The area cobra habitat in Turkmenistan is 44 million hectares, lebetina viper – 2 million hectares. Due to the conditions improved stability and increase of a number of cobra it is possible to exclude it from the list rare and endangered vanishing species and to move to a category «the restored kinds» (Shammakov, 2007).

In the Global strategy of CBD special value was given to the system of the further enhancement of process of scientific and technical exchange and intermediary in information exchange that is the system of formation of Clearing-House Mechanism. The detailed analysis of long-term requirements of CHM capacity in Turkmenistan made possible to define its audience, to establish priorities for institutional capacity in general and capacity of specially protected natural areas. Possibilities of institutional capacity potential for work in priority directions are considered; taxonomic initiatives, researches on alien species and actions on support of traditional knowledge. Results of the executed projects, including national reports on biodiversity, are adapted to CHM program. The general range of parameters of national capacity is identified for establishing of the future system of monitoring which in the result should lead to creation of CHM Center in the country. The functions of the mechanism of mediation in Turkmenistan are focused on thematic information sharing with all Parties of the Convention and will be used for maintenance of national (internal) biodiversity resources management.

2.5. Financing of priority actions (national and international)

Turkmenistan having the status of developing country is guided basically by national sources of financing. The national budget of the country allocates expenses on scientific biological researches, including also the needs of preservation of biodiversity in protected areas. However there are no national trust funds or the target financial programs aimed at BSAP implementation. The measures on tax exemptions for the purposes of biodiversity preservation are not in use in the country. Monitoring of financial support of works on biodiversity preservation is not arranged in the country and BSAP coordination group which could become the center of development of new financial mechanisms, establishing relations between donors and the organizations-executors is not created,. Therefore it is very important for the country to have the national Plan of sustainable financing, with assessment of financial requirements on biodiversity support, identified available amount of financial resources and the requirements for innovative mechanisms of financing, in particular in management of off-budget means.

It is necessary to mention the tangible GEF contribution to the country on reduction of current level of losses of national biodiversity within the frame of PA and support of efforts on capacity building. In the field of biodiversity during 2000-2007 Turkmenistan has implemented 36 projects, 18 of which have been invested by GEF and 9 – with participation of the international public fund WWF. The country has got support of GEF on development of the national strategy and action plan on biodiversity preservation, carrying out of self-assessment of national capacity for Convention implementation, execution of a set of actions on biodiversity preservation in-situ and ex-situ, and also elaboration of national reports on implementation of CBD decisions, etc. The main thematic areas financed by GEF are: preservation and sustainable use of biodiversity within the frames of PA; agro-biodiversity; capacity requirements; research and the sea ecosystem. External financial support through the international grants together with budgetary financing has enabled to enhance the state system of protected natural areas, to publish the Red Data Book of Turkmenistan. Separate BSAP actions have been financed by the international donors.

Unfortunately, the private sector funding has not been used on biodiversity maintenance. In this field of activity between the state and the private sectors there is no mutually advantageous cooperation. Thereupon there is a necessity for implementation of the specific projects targeted at training of representatives of interested parties (public represented by private business and the financial program of state structure) in the field of development of relations of their cooperation. At CP-9, the CBD Secretariat has urged to essentially increase international and internal financing of biodiversity to developing countries, and the four-year structure of 6 priority programs has been confirmed. These decisions will help Turkmenistan to provide adequate financing of BSAP actions on support of biodiversity and implementation of three purposes of the Convention.

2.6. Review of achievements and obstacles

During the difficult period of reformation, the country has kept capacity of 8 reserves and 14 sanctuaries and has developed Biodiversity Strategy and action plan of Turkmenistan (BSAP). Certain actions for preservation of key globally endangered species have been implemented and a basis for the national Center on Clearing-House to the mechanism has been established. Creation of green ring of arboreal-shrubby breeds around Ashgabat and industrial centers of the country is considered as a process part of reforestation. The started process of investment in development of environmental tourism in protected natural areas is a birth of the new market - the market «debts for the nature». Within the frames of CEP susutainable monitoring works on ctenophores are conducted and the struggle actions aimed at decrease of its number and reduction of the area of its secondary (anthropogenous) habitat in the Caspian sea are developed. Progressing is the construction of the new Zoological park of the country - the National museum of wildlife, with the area of 40 hectares, where nearly 300 kinds of animals will be represented, the overwhelming majority being representatives of local fauna.

Actively implementing many priority tasks of BSAP, the country made assessment of obstacles for realization of this strategy on biodiversity preservation. The BSAP Document has not been confirmed on a legislative basis by the head of the state and has not been accepted to management and execution by national economy sectors. At the same time, the model of CHM site is developed in the country that will make the national BSAP accessible in the Internet. Assessments of requirements for building CHM capacity has revealed necessity of legal (juridical) recognition of the mechanism in the country, elaboration of offers on introduction of CHM system of monitoring. Its results became a justification for

establishment of the National biodiversity center, or CHM Center in the structure of the Ministry of Nature Protection of Turkmenistan. Subsequent activation of the process of access to the financial resources, provided through the mechanism of Convention financing *(especially on taxonomic to researches, alien species and adaptation of biodiversity to climate changes)*, will promote to supplement the budgetary funds with financial resources of international, donor, private and other possible sources.

Absence of Coordination group on management and administration of BSAP process implementation has complicated a problem of gathering of information on the basic components of biodiversity for assessment and monitoring of process of execution by the country of commitments under the biodiversity Convention.

At the same time, the country is ready to start formation of new economic mechanisms and incentives for execution of obligations under the Convention. It is necessary to enhance measures on preservation of front-asian leopard, Turkmen koulan, bezoar goat, goitered gazelle, etc. in the environment. Thereupon, the economic assessment of natural ecosystems is of great importance for the decision-makers. Such assessment can show possible benefits from direct use of the ecosystem resources and from performance by them of media-forming functions. The international donor investments, being based on implementation of article 15 of the Convention on access to genetic resources and fair distribution of benefits for using them *(medicinal raw materials of vegetative and animal origin, selection resources, cryobank materials, etc.)*, could support the country's intention to make the market of genetic resources its leading strategic component.

Considering the contribution of natural ecosystems of Turkmenistan to global stability of biosphere, of special importance for the country becomes also the market of ecosystem services, based on international mutual payments. In Rio de Janeiro the developed countries have assumed the liability to allocate about 0,7 % of gross national product on means for indemnification to local communities for preservation of ecosystems of global value, for example mountain juniper woods. According to the scheme of mutual settlements, our country has a real chance to obtain compensation for the preserved wild nature if the developed countries fulfill their obligations. For this purpose it is necessary to calculate at national level the cost «ecosystem services» and to make corresponding assessment of the ecosystems contribution to global biospheric sustainability.

CHAPTER III. INCLUSION OR ACCOUNT OF BIODIVERSITY SUBJECTS AT SECTORAL AND INTERSECTORAL LEVELS

The program document of the country on preservation of the environment – operating NEAP, having valid law force, is also the environmental component of the National program «Strategy of economic, political and cultural development of Turkmenistan for the period till 2020». Turkmenistan, having started introduction of the mechanism of long-term international cooperation on preservation and sustainable use of biodiversity and coordination of actions within the frames of Pan-European strategy of biodiversity preservation and implementation of the targets of the Convention on biological diversity, operates within the frameworks of the Regional action Plan on preservation of the environment of the Central Asia.

3.1. Scale of inclusion of biodiversity subjects in sectoral and national strategy and programs

Scales of inclusion of subjects of biological diversity depend on the scale of involvement in work of the basic sectors and the key subjects affecting preservation and its sustainable use. Problems of preservation and sustainable use of biodiversity in the related sectoral plans and programs (C and D) it is included in BSAP. However for many sectors of national economy, implementation of BSAP did not become priority and has not been integrated into their national plans and strategies. Weak coordination or integration between MNP actions and the institutions, directly influencing biological resources, have created certain difficulties. Though the BSAP actions have been confirmed by the State commission on maintenance of fulfillment of obligations of Turkmenistan following from conventions and programs of the United Nations on environment, but the corresponding executive office - the Coordination center on biodiversity has not been established and additional expenses on support of biodiversity and strengthening of its capacity have not been included in the country budget. All this as a whole has complicated the process of BSAP implementation, gathering of information and inclusion of biodiversity subjects in sectoral and national strategies and programs of environmental sector *(agriculture, education, public health services, forestry, fishery, gas and oil production, tourism, trade)* and social sector *(national plans of meeting the Targets of development for the millennium, etc.).*

The problem of sharing of benefits from sustainable use of biodiversity was not considered at sectoral level of other programs and plans of action. Maintenance of high level of people's well-being is based on development of economic basis, in which questions of economic support of biodiversity by forces of the local farmers cultivating age-old kinds of food value are not included. Problems of preservation of biodiversity and its sustainable use have not been included in the National Action Program to combat desertification (NAPD, 1996), action Plan on mitigation of global warming impacts; and have not been considered at the work analysis of sectors of economy in the program document « Sustainable development of Turkmenistan, RIO+10» (2002). Partially this problem has been covered in such documents, as *«the Regional action plan on preservation of the environment for the Central Asia»* (UNEP, 2001) and the First national report under the Frame convention of the United Nations on climate change in Turkmenistan.

3.2. Functional mechanisms of strategy, national and regional programs and memoranda

Partner cooperation on regional and international levels enabled to promote introduction of the advanced world level scientific achievements into the country industry. Turkmenistan, being the party of Regional strategy of preservation, replenishment and use of genetic resources of plants for the foodstuffs and agriculture in the Central Asia and Trans-Caucasus for the period till 2015, does the first steps on fulfillment of the international commitments in the field of agro-biodiversity.

The international community, represented by such international institutions as the International Center of Agricultural Researches in Droughty Areas (ICARDA), the International Plants Genetic Resources Institute (IPGRI), etc., recognizes the achievements of selectionists of Turkmenistan, aimed at increase of agricultural crops production by raising crop yield. With Consultative group support on the international agricultural researches (CGIAR), the Network on genetic resources of plants of the Central Asia and Trans-Caucasus (CATCN-PRG) is established. Since 2006 "the Agreement between the Ministry of Agriculture of Turkmenistan and the International Center ICARDA about joint cooperation in the field of agricultural science", intended for maintenance of technical support of agrarian

researches on increase of efficiency and stability of crops of the basic food cultures and management of natural resources functions in the country.

Among international programs, establishment of regional the information-analytical centers (RIAC) in five states of the Central Asia (Kyrgyzstan, Kazakhstan, Tajikistan, Uzbekistan, Turkmenistan) and creation of complex system of monitoring of natural ecosystems of the Caspian sea can be mentioned. Besides, within the frames of initiatives of the countries of the Central Asia on land resources management (CACILM), the process of the development of actions on prevention of land degradation has been started.

At the International conference devoted to the World water forum (2005) as priority direction has been recognized the concept *"the Integrated water resources management"* - as the mechanism of water management which can not only solve organizational questions on prevention of water crisis, but also apply them in practice.

Within the frames of the Caspian Environmental Program, the Report on biodiversity to the Frame Convention on protection of the Caspian sea environment is developed. The regional consultative group on biodiversity and alien species operates. Implementation of the regional *"Strategy Action Plan"* (2004, GEF) will enable the countries-participants (Russia, Kazakhstan, Azerbaijan, Iran, Turkmenistan) to solve separate national problems on sustainable management of fish economy and all its bio-resources.

As the Convention component on preservation of migrating kinds of wild animals Turkmenistan has signed "the Memorandum of mutual understanding on preservation, restoration and sustainable use of saiga *(Saiga tatarica tatarica)"*, "the Memorandum of mutual understanding on preservation of white crane *(Grus leucogeranus)*»"and "the Memorandum of mutual understanding on preservation and restoration of red deer *(Cervus elaphus bactrianus)"*.

3.3. Ecosystem approach and its use

The ecosystem approach is the main basis of the balanced decision on protection and rational use of water and land resources, wetlands and biodiversity restoration. The operating mechanism capable of creating favorable environment for developing in the nearest perspective of sectoral strategies and plans, aimed at minimizing of adverse influence on biodiversity, is the Clearing-House Mechanism (CHM). For today the Ministry of Nature Protection has developed a site model on CHM. As the key indicator of monitoring the *national biodiversity monitoring system* (NBMS) – the CHM structure component will act. It is necessary to develop the integrated program of biodiversity monitoring and a uniform methodical basis for regular data collection from different sectors of national economy on their influence on biodiversity.

Turkmenistan has entered the process of long-term interstate cooperation on biodiversity monitoring (ECONET; COT) on ecosystem level. Later Turkmenistan is planning to introduce biodiversity parameters in the mechanism of conducting monitoring of negative climate changes impact on biodiversity. National requirements and priorities concerning use of the Guiding principles adopted at VI meeting of the Convention Parties are partially identified in the country. The mechanism of coordination of national programs with the purpose of application of Guiding principles also requires strengthening.

For solution of common environmental problems of the Central Asia, the Environmental strategy of Eastern Europe, Caucasus and Central Asia countries (EECCA) was developed in May 2003 with participation of Turkmenistan (Kiev), aimed at the search of close cooperation and partnership of East-West. Considering and recognizing interrelation between economic, environmental and the social problems, this strategy is directed on

enhancement of environmental sustainable development component – that is search for ways of effective solution of environmental problems. Reckoning with, and supporting substantive provisions and purposes of EECCA environmental strategy, participants of the meeting consider that it is necessary to recognize as a strategy priority the creation of elements of sub-regional institutional bases for solution of trans-boundary problems on the basis of already existing interstate institutes. First of all, it is the operating Central Asian Countries Special Program (CASP), ISDC and the International fund of rescue of Aral (IFRA). The EECCA strategy should be accompanied by the plan of specific joint actions of the countries and the international institutions, guiding by existing sub-regional plans such as, for example, NEAP.

Priority main targets of the national Strategy on capacity support in the field of successful management of ecosystems (including biodiversity) are presented in the report *"Capacity assessment for implementation of global environmental Conventions of the United Nations. Thematic reviews"* (2006). The target task on sustainable use of bio-resources is included in NEAP and BSAP. Within the frames of CEP the Protocol on biodiversity to the Frame Convention on protection of the Caspian sea environment is developed. The regional consultative group on biodiversity and alien species is operating. Implementation of the regional *"Strategy and action plan"* (2004, GEF) will enable the countries-participants (Russia, Kazakhstan, Azerbaijan, Iran, Turkmenistan) to solve separate national problems on sustainable management of fish economy and all its biological resources.

The Ministry of Nature Protection tries to solve the problems of the national biological diversity preservation and sustainable use of bio-resources through the Clearing-House Mechanism system, and to suggest including of those in all sectors of national economy in the nearest future.

3.4. Scale of inclusion of biodiversity subjects into environmental consequences assessments

Questions of impact of environmental contamination through water resources, land and air on biodiversity components are included in NEAP and BSAP. The set of nature protection laws and by-laws operating in the country regulates the relations connected with the solution of problems of adverse consequences from negative impact on environment. The "National plan of Turkmenistan on prevention and liquidation of oil spills" (2001) is developed in the country and the Decree of the President about approval of Rules of protection of coastal waters of Turkmenistan from sea vessels pollution (2005), aimed at execution of obligations following from the international agreements on preservation of the environment is adopted. According to application of the Law on the state environmental examination (1995), the Ministry of Nature Protection enhances the mechanism of control of the national economy sectors impact on environment.

The Standard currently in force in the country on assessment of environmental impact (EIA, 2001), is needed as a working document at planning of certain categories of units and kinds of activities, including also environmental impact on biodiversity. At the project development stage the analysis of environmental influence on animals and plants is made, and recommendations are developed, for example, on treatment of ballast waters of Caspian sea, sewage treatment utilities, clearing of Soymonov bay, etc. Methodical recommendations about maximum permissible emissions in the atmosphere are confirmed. The technique of calculation of the damage caused to the state by infringement of the water legislation is improved; the amount of the claims which are subject to collecting for pollution of atmospheric air is defined; the damage of burning of oil and oil products is defined, etc. The works on forecasting of CO2 emissions model and other greenhouse gases in the atmosphere,

connected with the global warming continue. Development of control indicators over pollution impact on biodiversity remains the country priority for the nearest future.

The law on nature protection (1991), being the main nature preservation document, stipulates legal, economic and social bases of preservation of the environment. In the Criminal Code of Turkmenistan and the Code of Turkmenistan on Administrative misdeeds, the assets on infringement of the property right for forest, animals and plants, regulations on protection of water resources and land use, fire safety demands, etc. are provided.

The State Commission on emergency cases functions in the country, which makes strategic environmental assessments at different levels. The Law on prevention and liquidation of emergency cases (1998) that stipulates implementation of scientific researches on the environmental safety issues has been adopted. At the stage of discussion is a question on signing of the Convention of the European economic commission by Turkmenistan on trans-boundary impact of industrial accidents, which often have considerable influence on biodiversity.

In November 2006 "the Frame convention on environment for sustainable development of the Central Asia", as its integrated environmental strategy has been adopted in Ashgabat. It is necessary to notice that such Convention will help to unite legislative frameworks and mechanisms of already existing agreements between the countries in this field. Establishing of integrated legislative platform will promote generating additional priorities, identifying prospects of the further regional cooperation of the Central Asian countries on implementation of tasks in the field of preservation and sustainable biodiversity resources management. Separate articles of this international document consider the general questions/frames of monitoring and assessment of pollution of atmospheric air and waters, exhaustions of water resources, land degradation, mountain ecosystems, and waste management.

Special attention in the Convention is paid to scientific and technical cooperation in solution of environmental problems and development of joint actions on biodiversity preservation (article 13). Issues of information exchange and access, and also public participation in its implementation are identified. The separate Protocol on biodiversity to this Convention will start operation after its signing and ratification by all countries of the Central Asia. Within the frames of ISDC activities, the Assessment report on priority environmental problems of the Central Asia (2006) and the integrated assessment of the environment state of the Central Asia (2007) have been prepared and published.

CHAPTER IV. CONCLUSIONS: RESULTS OF IMPLEMENTATION OF THE GLOBAL TARGET AND CBD STRATEGY PLAN IN TURKMENISTAN

Assessment of national results of target implementation, targeted for 2010 is made on the basis of CBD VIII/5 decision, using temporary structure of targets and target tasks (Supplement II. Guiding principles of the fourth national report submission).

A. ASSESSMENT OF RESULTS OF TARGET IMPLEMENTATION PLANNED ON 2010

Protection of biodiversity components

TARGET 1. PROMOTION OF ECOSYSTEMS BIOLOGICAL DIVERSITY PRESERVATION, HABITATS AND BIOMS

Target task 1.1. Effective preservation of no less than 10 % of each of the environmental regions of the world

The scale of protected areas of Turkmenistan is has been generated during more than 80 years, since 1927, and is for today 1916,02 thousand hectares, or 3,9 % of the country territory. Protection of biodiversity of Turkmenistan is provided in the borders of PA natural ecosystems of three provinces: Turan (Repetek, Amudarya and Kaplank reserves), Mountain-Central-Asian (Koytendag reserve) and Kopetdag-Horasan (Syunt-Hasardag and Kopetdag reserves). Ecosystems of Badhyz reserve lying on a joint of Karakum desert, Kopetdag-Horasan mountains and foothills of Parapamiz, and Hazar (former Krasnovodsk) reserve where typically dry trans-Caspian desert contacts the east part water area of the Caspian sea (*Review of reserves of Turkmenistan, 2006)* are protected also.

Now under the authority of PA network there are 8 national reserves of the I IUCN category (789, 2 thousand ha), 17 nature monuments of the III IUCN category (2,02 thousand ha), 14 sanctuaries of the IV IUCN category (1 061,2 thousand ha) and protected zones of the reserves (63,6 thousand ha) of the V IUCN category. All of them are in a state ownership and are subordinated to the Department flora and fauna protection of the Ministry of Nature Protection. The PA network was arranged in the habitats of rare, vanishing species, including those that are the IUCN Red Book and in the Red Data Book of Turkmenistan (Appendix III b). The country takes specific measures on expansion of the system of protected areas by establishing national parks, the differentiated wildlife management and enhancing management capacity. According to the international technology developed for the World Bank and WWF, the process of control of management efficiency for protected areas of Hazar and Badhyz reserves is started.

BSAP target tasks for protected areas have been added by 3 activities of the strategic component A (Appendix II), having reflected the targets and the target tasks identified by VIII/15 decision of CBD Secretariat to the more full extent.

Target task 1.2. Protection of the areas presenting special importance for biodiversity

The species fullness and character of distribution of species at ecosystem level act as the indicator of protection of habitats of biodiversity components. Ranges of Kopetdag, Badhyz and Koytendag mountains - one of the priority regions of the planet characterized by indicators of specific richness at high level of endemism (18 %). In the mountains and foothills there is 2/3 of all specific biodiversity of on-land vertebrates of the countries at obvious indicator of floristic richness. In Kopetdag and Koytendag speciation processes, due to spatial and environmental isolation – species formation and endemism at genus and specific levels are actively developing.

Comparatively high concentration of species variety of mountains have caused requirement for improvement of PA management efficiency, having generated the new system of zoning of territory. Apart from a reserve zone it was proposed to establish a national park (II IUCN category) in Southwest (Sumbar NP) and Central (Archabil NP) Kopetdag in the existing PA system.. The sub-zone of special nature protection mode (present territory of reserve) will enter into the borders of a national park (NP), having supplemented it

by the zone of nursing and recreation and a new category – "protected landscape" (category V of IUCN) of foothills plains with semi-desert low hills. Besides, the existing national system of protected areas will be included in the projected regional network ECONET for long-term preservation of biodiversity in Central Asia, covering also key ornithological territories, the quarter of which overlaps the ECONETWORK of protected areas. This will enable to considerably expand the system of protected areas by inclusion of the priority zones representing special importance for preservation of biodiversity of the country.

TARGET 2. PROMOTION OF ECOSYSTEMS SPECIES DIVERSITY PRESERVATION

Target task 2.1. Restoration, preservation or restriction of reduction of populations of species of separate taxonomic groups

Activity of operating reserves and sanctuaries of the country is aimed at protection and restoration of separate taxonomic groups of endangered plants and the animals, though the degradation of vegetative cover occupies today 74,9 % of its area, and it yields to stabilization with difficulty (NEAP).

The program document on restoration of number of endangered plants and animals species is the Red Data Book of Turkmenistan (1999). Breaking of biocoenotic connections in PA natural ecosystems is correspondingly reflected in taxonomic structure of protected species. Out of 261 species (152 animals and 109 plants), included in the Red Data Book of Turkmenistan, part of individuals (135 kinds of animals and 71 — plants) (or 78,9 % of total number) are protected in the PA territories of existing reserves and sanctuaries. The Red List of IUCN (2000) comprises 82 species of flora and the fauna of Turkmenistan protected in PA territory, but 26 of them have not been included in the Red Data Book of Turkmenistan. In total 120 kinds of animals and 10 species of plants of Turkmenistan are put on the IUCN Red List of 2007 edition, being endangered to different degree. This list of species is an indicator of existing threat factors to biodiversity (or limiting factors), from the other side – an index of modern state of affairs concerning preservation of rare and vanishing species at national, regional and international levels. The quantity of species which are endangered acts as the indicator of conditions of national biodiversity.

Target task 2.2. Increase of the status of endangered species

Assessment of risk of disappearance of biodiversity components of Turkmenistan on specific, sub-specious and population levels is given in the second edition of the Red Data Book of Turkmenistan (1999). The quantity species moved to a category of higher status acts as the indicator of response on arrangement of protected areas system. Unfortunately, in the absence of the data on a number of some globally important species entered in the Red Book, it is impossible to track a trend of all changes in a species status over the last 10 years and make the related assessment of taxon. Due to the influence of anthropogenic factor, the danger remains today, for example for all three kinds of urial *(Ovis vignei),* markhor *(Capra falconeri)* and bezoar goat *(Capra aegagrus),* leopard *(Panthera pardus ssp. saxicolor),* carrion-birds, etc. In total the I category species of the Red Data Book of Turkmenistan (1999) - disappearing or endangered, includes 17 kinds of animals and 28 plants. Though, in 90-s of the last century the general tendency of share increase of the species representing critically endangered categories in the majority of groups was observed. Such tendency

indicated that the efforts (establishment of PAs) applied in the country to preservation of species, entered in the Red Book, in the conditions of climatic moves to global warming can appear insufficient to change the situation. Prohibition of export of snakes from the country and closing of three serpentariums stabilized the situation, having increased a number of the Central Asian cobra *(Naja naja ssp. oxiana)* and lebetina viper *(Macrovipera lebetina)*. The experts offered to exclude cobra from the list of rare and vanishing species and to transfer it to a category "the restored kinds" (section 2.4.).

TARGET 3. PROMOTING GENETIC DIVERSITY PRESERVATION

Target task 3.1. Preservation of genetic diversity of agricultural crops, livestock and kinds of trees consumed commercially, fishes and wildlife products, including other valuable protected kinds of plants, and maintenance of the related native and local knowledge

Preservation of national agro-biodiversity, its species composition with features of concentration in places of their origin is one of priority problems of national BSAP and NEAP. Being a party of CBD and Cartagena Protocol, Turkmenistan automatically became the participant of the International Agreement of FAO on vegetative genetic resources for manufacture of the foodstuffs and agriculture (2007). Turkmenistan is as also the Party of Regional strategy of preservation, replenishment and use of genetic resources of plants for the foodstuffs and agriculture in the Central Asia and Trans-Caucasus for the period to 2015 (2007).

Preservation of national genetic diversity and livestock in internal market, same as its protection against introduction of GMO products in the market from the outside, and also solution of problems on access to genetic resources and share of benefits, have big strategic value for Turkmenistan. However specific measures are not elaborated as of today, and to some extent they are being solved on the basis of contractual agreements between participants and users of GPR without material benefit for the country and farmers. Therefore the establishment of the international mode on access to genetic resources and share of benefits is equally important. Thereupon it is important to define modern possibilities of the country on access to genetic resources, by applying preventive activities targeted at assessment (survey) of state of affairs in environmental safety of the country and urging the campaign for increase of knowledge level of the population and decision-makers, about GMO products in internal market. Solution of all these questions must be within the frames of *the national legislation on protection of population from introduction in the consumer market of GMO-PRODUCTS.*

Assistance to sustainable use

TARGET 4. ASSISTANCE TO SUSTAINABLE USE AND CONSUMPTION

Target task 4.1. Acquisition of products of a biodiversity from sustainable management sources and management of productive areas in accordance with the biodiversity preservation tasks

The areas of territories with sustainable management (use), are represented by forest-covered (8,1 %) and pasture (95 %) ecosystems which are the suppliers of foodstuff on the basis of local agro-biodiversity. Rules and limits of sustainable use of medicinal and food plants are developed and confirmed.

The sea aqua-culture only starts to develop. Insignificant mitigation of social and economic living conditions of local population of the East coast of the Caspian sea, implemented within the framework of CEP, has positively changed their life, having directed efforts to decrease in reduction of populations of rare species of fishes and near-water kinds of birds (section 1.2.4.). However, the problems of biodiversity preservation and its sustainable use have not been included in the National Action Program to Combat Desertification (NAPD, 1996) and the Action Plan on mitigation of global warming consequences. Questions on biodiversity and its sustainable use have not been considered at the analysis of work of sectors of economy in the program document *"Sustainable development of Turkmenistan, RIO+10"* (2002) and the *"Regional action plan on preservation of the environment for the Central Asia"* (UNEP, 2001).

Target task 4.2. Reduction of unsustainable consumption of bio-resources with the purpose of biodiversity preservation

Separate steps on decrease in rates of unsustainable consumption of biological resources are undertaken, but they do not have yet obviously expressed positive effect.

Target problem 4.3. Ensuring safety to wild flora and fauna against the threat from international trade

Turkmenistan is not the Convention party on international trade in endangered species of wild fauna and flora (CITES). But the legal base (the Customs code of Turkmenistan and the Rules of moving the goods through the customs border), conforming the CITES guidelines exists in the country, having real influence on poaching and illegal trade. Hard currency hunting in habitats of wild animals is not in use in the country.

Elimination of threat factors for biodiversity

TARGET 5. LOADS CAUSED BY LOSS OF HABITATS, CHANGE OF LAND USE STRUCTURE, DEGRADATION OF LANDS AND UNSUSTAINABLE WATER USE, ARE REDUCED

Target task 5.1. Reduction of rates of loss and degradation of natural habitats

The total gasification of settlements of the country has rendered and continues to have positive influence on decrease in volumes of trees and bushes cuttings of desert and mountain ecosystems. Projected expansion of the area of protected territories and territories of the regulated wildlife management is aimed at reduction of rates of loss and degradation of natural habitats of wild animals.

TARGET 6. CONTROL OF INVASIVE ALIEN SPECIES THREATS

Target problem 6.1. Control over the main ways of potential penetration of invasive alien species

The first list of alien key species of adventive fauna is prepared in the country: 25 species of vertebrates and 32 invertebrate animals (especially insects-phytophages), invasive nature of which is revealed in 24 kinds - a component of the Global register on invasive species. The invasion nature is revealed at barnacle *(Balanus improvisus)* and ctenophores mnemiopsis *(Mnemiopsis leidyi)* – competitively active hydro-biont, displacing trade kinds of fishes.

The adventive fraction of local flora does not exceed 20 % of the general structure. Among them we can mark out 5 naturalized arboreal kinds, 39 new advent-kinds (drop-in), 20 "refugees" from culture and 646 kinds of "weed" biota (315 genus, 61 families) which for the period of less than 50 years have increased by 31 % (Kamahina, 2009). Running wild of some cultural or cultivated kinds, as an example of re-domestication, is also significant (Levin, 2008).

Financial resources of the country for the fulfillment of commitments in relation to alien species are not fully mobilized. At present the state control and monitoring is conducted only on the group of quarantine agents of plants decease, plant pests and phytogenous products and weeds, wood and agricultural crops pests. (section 1.2.3.).

Target task 6.2. Implementation of struggle plans against main invasive alien species endangering ecosystems, habitats, or species

For the control of the main ways of penetration of invasive species in the territory of Turkmenistan and risk assessment from consequences of their introduction, additional actions (Supplement II) are developed. For applying efforts to combat the threats of those species, preliminary list of the key alien species capable in certain environmental conditions to show invasion activity in relation to the national biodiversity is made.

The scale of struggle with invasive species is indicated in the National Caspian Action plan (NCAP, 2008). Particular attention is paid to ctenophores mnemiopsis *(Mnemiopsis leidyi)* – competitively active hydro-biont, displacing marketable kinds of fishes. Being a biological pollutant of all Caspian sea system, ctenophores is considered to be the main reason of reduction sprat and other fishes production. Within the framework of the second CEP phase the program of researches on estimation of scale of moving of species-invaders to the Caspian sea and back. Results of researches will promote to choose the most economical control measures of this relocation.

TARGET 7. DECREASE IN LOADINGS CAUSED BY CLIMATE CHANGE AND ENVIRONMENT POLLUTION

Target task 7.1. Support and increase of resistibility of biodiversity components to climate change and ability of adaptation

During elaboration of the second FCCC Report (2006-2009), the separate block “Biodiversity and climate change” was developed related to the issues of forms of biodiversity adaptation in the conditions of existing and forecasted consequences of climate change. Problems of support and increase of resistibility of biodiversity components to climate change are presented in Additional BSAP actions (Supplement II). In 2008 the

regional seminar of the Central Asia countries on climate change problem, including issues of adaptation has been held in Turkmenistan. With the same purpose, it is planned to arrange the Conference of ministers of environment preservation of the Asian-Pacific region countries in 2012.

The Set of recommendations within the frames of the National Action Plan on implementation of the preparatory measures leading to reduction of greenhouse gases emission is developed. Climatic shifts (first of all, autumn-winter drought) in the territory of Turkmenistan may lead to essential disproportion of heat and moisture. The presumed increase in air temperature from 1,1 to 1,8oC can essentially break the nature balance, displacing borders of natural belts by expansion of deserted ecosystems. Process of spreading of alien species will be intensified; many of these species may display invasion nature. Shift of areas borders of some animals to the north; environmental shifts, or change and expansion of places of their wintering are possible. Reduction of quantity of water sources will lower number of many species of mammals group. Amount of plankton in sea ecosystem can also be reduced that will negatively affect structure of sea kinds of birds and fishes. In vegetative cover, species of plants of the global value, entered in the national Red book and the international Red list МСОП will appear the most vulnerable to global climate change.

Target task 7.2. Decrease of level of environmental pollution and rate of its influence on biodiversity

Turkmenistan, implementing decisions of Vienna Convention on protection of ozone layer and the Montreal Protocol on the substances destroying ozone layer (1993) and its amendments (1994, 2008), executes activities on regulation of circulation and use of specially resistant and dangerous contaminants of water, air and soil. At the 16th meeting of the Parties of Montreal Protocol (2005) Turkmenistan became the Party acting within the frame of item 1 of article 5 of the Montreal Protocol.

Implementation of the Montreal Protocol in Turkmenistan is entrusted to the Ozone Center within the frames of the Ministry of Nature Protection. In close cooperation with the Ministry of Energy and Industry, State Customs Service, Ministry of Agriculture and other ministries and institutions, MOP carries out the actions aimed at fulfillment of commitments of Turkmenistan in the frames of Montreal Protocol on decrease of environment pollution level. The State Program of Turkmenistan on disposing of ozone-depleting substances (ODS) has been developed (1998). It is intended for decrease in consumption of ODS, analysis of the present situation and future consumption forecast. Managing activity on realization of the Montreal Protocol is executed in the frames of project implementation “Institutional enhancement for implementation of the Montreal Protocol in Turkmenistan” (Verveda, 2009).

Support of goods and services provided by biodiversity to promote well-being of the people

TARGET 8. SUPPORT OF ECOSYSTEMS ABILITY TO PROVIDE GOODS AND SERVICES AND SECURE LIVELIHOOD SOURCES

Target task 8.1. Support of ecosystems ability to provide goods and services

Implementation of the National Program tasks "Strategy of economic, political and cultural development of Turkmenistan for the period till 2020" is aimed at support of the ecosystems productivity, providing the country with wheat, vegetables and products of cattle-breeding. In future the country intends to allocate the larger portion of its territory to the area of nature protection cooperation and agricultural use of lands. Therefore, it supports the ecosystems ability in providing sustainable use of natural resources. The future development and enhancement of legislation will enable to develop the program of compensations to the local population for the damage caused by confiscation of the lands for PAs. The target task on sustainable bio-resources use is included in NEAP and BSAP.

The budgetary funds of NIDFF finance the works on "Elaboration of methods of restoration of pistachio and archa (juniper) forests of the Central Kopetdag" within the frames of the state programs "Juniper reforestation in Turkmenistan" and "Creation of pistachio forest parks". Besides this, within the frames of the project "Creation of pistachio forest parks" (2006-2008, TICA), actions are being implemented on preservation of Koytendag, Central and Southwestern Kopetdag pistachio forests genetic fund. In accordance with the Decree of the President about measures on further improvement of the environment and creation of favorable climatic conditions (2000), the artificial forest and recreational woods zones continue to be arranged around the cities in the country *(F.1.2., BSAP).* These zones provide support to ecosystems by decreasing the level of environment pollution that considerably reinforces protective functions of forests (mountain and desert).

The country lays a basis for transition to sustainable use of natural resources of the Caspian sea. In the coastal zone the facility will be constructed for artificial breeding of sturgeon kinds of fishes. This will enable to create genetic bank for reproduction of sturgeon fishes. Implementation of the regional "Strategy Action Plan" CEP (2004) will permit the countries-participants (Russia, Kazakhstan, Azerbaijan, Iran, Turkmenistan) to solve separate national problems on sustainable management of fish economy and all its bio-resources.

Target task 8.2. Preservation of biological resources, supporting sustainable life activity, local food security and health care, especially of poor layers of population

The problem of sustainable use of the biological diversity components is regarded today at the level of solution of the problem of local communities traditional knowledge support, in particular at the level of medical herbs use by the local population, development of access mechanism to genetic resources and joint benefits sharing. In this connection it is very important to arrange a system of interdepartmental coordination and interaction on biological and landscape biodiversity preservation in the country. One of the first steps in this regard is the development of intersectoral cooperation of organizations, located in the seashore Caspian zone and local population support within the frames of implementation of the project "Preservation and sustainable use of global importance biodiversity in Hazar reserve on the Caspian sea coast". In the result, the tasks on biodiversity preservation will be included into industrial sectors also. For solution of the problem of sustainable management of land, forest and pasture resources, the project "Capacity building and investments at local level for sustainable use of land resources" has been developed. Introducing and propagation of the best practices and skills improvement of the land users will help local communities to better understand the reasons of land degradation and to enhance their cooperation with local authorities.

Specific measures (including legislative) on preservation of genetic biodiversity of all agricultural crops and local breeds, providing food security of the country are not sufficiently developed at present (except wheat). The specialized program on sustainable use of agro-biodiversity components is absent at national level. The process of displacement from the

market of the local aged kinds of vegetables *(tomatoes, cucumbers, eggplants, radish, pepper)* has started already, and is intensifying each next year. The information field on GMO products is not created in the country, and even decision-makers do not have clear understanding on this issue.

Protection of traditional knowledge, innovations and practice

TARGET 9. SUPPORT OF SOCIAL AND CULTURAL DIVERSITY OF INDIGENOUS AND LOCAL COMMUNITIES

Target task 9.1. Protection of traditional knowledge, innovations and practices

The problem of protection of traditional knowledge and practice is regarded in the country mainly at the level of making medicines using natural raw materials and use of vegetable dyes for manufacturing of carpets and felt items; although the traditions of farming have deep roots in our country. Protection of traditional knowledge of the farmers, engaged in cultivation of old-aged kinds and species, created on the basis of use of wild relatives, and also their innovations and practices – are stated in the planned activities of BSAP and NEAP as the document legally confirmed by the government of the country. In the near future the legislation on creation of normative and methodology base on intellectual property units assessment and on protection of folk arts works will be developed. The law on commercial secrecy, which should be supplemented by the section about legal security protection and know-how transfer is planned for development and approval by Mejlis (the Parliament) of Turkmenistan. The new Customs Code of Turkmenistan will be supplemented by the section on revealing procedure and responsibility measures for violation of intellectual property rights on the border.

Target task 9.2. Protection indigenous and local communities rights on their traditional knowledge, innovations and practice, including the right on joint benefits use

A whole number of normative and legal acts of general and special character in the field of protection of the rights of farmers (daykhans) – local communities of Turkmenistan, has been adopted and is functioning in the country. At the same time, many legislative acts are not adequate enough for making assessment of interconnection between agricultural practice and preservation and sustainable use of biodiversity components by the farmers – main keepers of biodiversity. Wide program of denationalization and privatization of the state property is aimed at restructuring of farming. As a result, the process of leasing relations building without direct assessment of knowledge and practice of local farmers, and their abilities to innovations, continues in the country.

The existing laws in the field of intellectual property indirectly cover the issues of biodiversity, not regarding the legislative norms on nature protection and forest property, national ownership of plant genetic resources and their wild relatives. At present the law “About protection of selection achievements” is at the stage of development in Turkmenistan. The law should regulate property and personal non-property legal relations, arising in the field of creation, legal protection and use of new patented kinds of plants. But the problem of the farmers rights on traditional knowledge remains open, as well as the question of legal protection of the species created with the use of wild growing cultures genetic fund, and the

issue of preservation of old-aged kinds of agricultural crops. The value of such kinds is in their natural genetic fund, and they have potential economic benefit. Importance of this is reflected in the decision of the country government on expedited development of fruit-growing, where the key place should be occupied by wild relatives of fruit crops. However, small farmers, without having practical possibility to gain benefit from the farmer's right on traditional knowledge, can not preserve them at their sites.

Therefore, further efforts are necessary on making changes and amendments to the existing national legislation, in particular on development of legislation on the protection of the farmers rights, intellectual property, including legal protection of traditional knowledge. At the regional seminar "Legislation, mechanism of benefits sharing from GPR use and protection of the farmers rights", that took place in Tashkent (11-14.11.008) existing national legal mechanisms for support of farmers and local communities in preservation in situ of the local breeds of fruit crops and their wild relatives have been studied. In terms of Article 9 of the International agreement of Food and Agriculture Organization of the United Nations (FAO) about plant genetic resources for foodstuffs manufacture and agriculture (2007), the release version of the Concept on the rights of farmers have been examined and direct relation established between international legislation and Biodiversity International/UNEP-GEF project *"In situ/*on farm preservation and use of agro-biodiversity (fruit crops and their wild relatives) in the Central Asia. The legislation issues were covered in practical and technical directions: definition of the rights of farmers has been provided; as a right which a farmer could practically apply in his work on growing the kinds, created with the use of wild and cultivated varieties. Development of integrated and well arranged normative and legal base on the farmers rights and development of organizational and legal forms of village farming could promote to make an important step in agro-biodiversity preservation activities.

Ensuring joint use on a just and equal basis of genetic resources use benefits

TARGET 10. ENSURING JOINT USE ON A JUST AND EQUAL BASIS OF GENETIC RESOURCES USE BENEFITS

Target task 10. Any access to genetic resources shall be provided in accordance with the Convention on biological diversity and the related provisions

The market of genetic resources of the CBD countries-participants is based on implementation of Article 15 about access to genetic resources and fair share of benefits for their use (medical raw of vegetable and animal origin, selection resources, etc.). In the beginning of 2008 Turkmenistan has joined the CBD Cartagena Protocol and intends to start development of frame documents on biodiversity. This will enable to activate the legal environment for preparing of justification for the new laws drafts development: *"On protection of traditional knowledge and genetic resources" and "On protection, access and circulation of genetic resources"*. Till now, the information field on GMO products is not created in the country. However, certain problems of getting benefits by the farmers from genetic resources use have been discussed at the regional seminar in Tashkent (21-24.04.2009) within the frames of the project Biodiversity International *"In situ*/on farm preservation and use of agro-biodiversity (fruit cultures and their wild relatives) in Central Asia".

Target task 10.2. Benefits from commercial and other use of genetic resources are jointly used on a just and equal basis by the countries providing such resources, according to the Convention on biological diversity and the related provisions.

The international legal foundation existing in the country, allows Turkmenistan, as a party of CBD and Cartagena Protocol on bio-security, to automatically become a participant of International FAO agreement on genetic resources for food manufacture and agricultural activities (2007) and Regional Strategy on preservation, replenishment and use of plant genetic resources for food and agriculture in Central Asia and Trans-Caucasus for the period till 2015. Gaining benefits from genetically modified organisms circulation and management of commercial use of genetic resources in accordance with the Cartagena Protocol standards is no arranged in the country yet. One of the BSAP actions has underlined the right of the community on genetic material, including regulation and control of use of genetic resources (wild, cultivated, human and other resources). For this purpose the importance of the legislative document "On access and benefits share in relation to biologic and genetic resources" for the country has been justified.

Ensuring adequate resources provision

TARGET 11. THE PARTIES SHOULD ENHANCE FINANCIAL, HUMAN, SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL CAPACITY WITH THE PURPOSE OF CBD IMPLEMENTATION

The article 20 of the Convention on biological diversity stipulates, that the countries which joined the Convention, should undertake the commitment to provide financial support and economic incentives in relation to those kinds of activities at national level, that are aimed at meeting the goals of wildlife protection.

Target task 11.1. The parties which are the developing countries, shall be provided with, in accordance with article 20, new and additional financial resources, for them to be able to effectively fulfill their commitments within the Convention frames

The government of Turkmenistan and UNDP are actively implementing the set of planned activities on environment protection for sustainable development, constantly increasing cooperation at national and sub-regional levels. Possibility to achieve the CBD targets is justified by the set of supporting activities of the project "Turkmenistan. Self-assessment of the need of national capacity building", implemented at three levels: system, institutional and individual (Thematic reviews/Assessment of capacity for implementation of the UN global environmental conventions, 2006).

Assessment of needs of institutional capacity of biodiversity and development of the related procedures are focused in the work of Clearing-House Mechanism – a component of the CHM web-sites network of each of the CBD countries-participants. The aim of CHM is – execution of functions of the focal center of gathering, processing and distribution of information on biodiversity in Turkmenistan and outside, for exchange with the other Parties of the Convention. The main task of the CHM Center is to provide informational support on biodiversity problems for taking managing decisions of different level and terms of access to information, its use and sharing among all users. Informational and analytic provision of

implementation of the Strategy and realization of the National Action Plan on biodiversity preservation is one of the main conditions of effective organization of the strategic process.

Target task 11.2. In accordance with item 4 of article 29, technology is transferred to the parties which are the developing countries, for them to be able to effectively fulfill their commitments within the Convention frames

Turkmenistan, having ratified CBD, expressed its concern and readiness in solution of the problem of national and world biodiversity preservation. Turkmenistan, having the status of a developing country, is guided generally by national sources of financing, but also mobilizing external financial support (international grants).Besides that, the country is ready to start formation of new economic mechanisms and incentives for execution of the Convention commitments. Together with the budgetary funding, such foreign support could promote to enhance the state system of protected areas and to publish the next volume of the Red Data Book of Turkmenistan.

Therefore, the economical assessment of natural ecosystems that can show probable benefits from direct use of their resources and execution by them of media-forming function, is very important for the persons making decisions. The market of ecosystem services, related to contribution of natural ecosystems in global biodiversity sustainability, is based on the international mutual settlement. In Rio-de-Janeiro the developed countries have undertaken obligation to allocate 0,7% of their gross domestic product as compensation to local communities for preservation of global value ecosystems, for example, mountain juniper forests. According to the scheme of mutual settlements, our country has a reliable chance to get reimbursement for preserved nature. For this purpose, it is necessary to calculate the cost of “ecosystem services” and to make the related assessment of the ecosystems contribution in the global biosphere sustainability.

The country should also recognize the economical value of genetic resources, biological species, the role of ecosystems and landscapes. For this purpose it is necessary to arrange a market “debts for the nature”, which could be established by investing in the development of environmental tourism in protected areas, restructuring of enterprises damaging unique nature units, etc. Engaging of economic incentives in the country can really force a user decrease the loadings on biological resources and biodiversity. According to international methodology, developed for the World Bank and WWF, the process of management control for protected areas of Hazar and Badhyz reserve has begun.

B. RESULTS OF IMPLEMENTATION OF TARGETS AND TASKS OF CBD STRATEGY PLAN

Assessment of results of implementation or promoting implementation of the related targets and tasks of the Strategy Plan is executed in the format of Supplement III of the Guiding principles of submission of the fourth national report.

Strategy targets and tasks	**National contribution in targets and tasks implementation**
TARGET 1. AT THE INTERNATIONAL LEVEL THE CONVENTION PLAYS LEADING ROLE IN SOLUTION OF PROBLEMS RELATED TO BIODIVERSITY	
1.1. Convention defines global	Convention in Turkmenistan plays a key role in solution

agenda in the field of biodiversity preservation and sustainable use 1.2. Convention encourages cooperation between all related international documents and processes with the purpose to provide more clear policy harmonization 1.3.The other international processes actively support implementation of Convention in accordance with their corresponding structures	of international problems related to preservation of the national biodiversity. This target is being successfully implemented in Turkmenistan and many of the targeted tasks of national BSAP (more than by 70%) can be implemented by the end of 2010. To achieve the progress in future, it is necessary to concentrate attention on including of the interests of biodiversity preservation and sustainable use in regional and national documents and processes, related to main branches of industry (as agriculture, forestry, fishery and trade) and on increase of the level of coordination at national scale. Turkmenistan participates at nearly all meetings of the Conference of the Parties (CP) of the Convention, successfully implementing this CBD target. The problems of preservation and sustainable use of biodiversity are included in the regional and national documents. CBD Provisions and decisions of CP are reflected in the international and regional documents and protocols of related Conventions on environment protection, in particular, Vienna Convention of ozone layer protection and Montreal Protocol on ozone-depleting substances (1993), and all its amendments (1994; 2008); Frame Convention on climate change (1994); Kioto Protocol (1996); Convention on desertification (1996); Ramsar Convention (2009), Sub-regional Frame Convention on environment protection for sustainable use of the Central Asia (2006); regional Caspian program, etc.
1.4. Large-scale implementation of Cartagena Protocol on bio-security	Turkmenistan has joined the Cartagena Protocol (2008) and is ready to take part in implementation of the mediation Mechanism on biological security. The process of project application development “Capacity building on development of national frame structures on bio-security of Turkmenistan (2010-2011) has started.
1.5. Biodiversity interests are included in the related sectoral or inter-sector plans, programs and policy at regional and global levels	Considerably little success has been achieved in including of subjects of biodiversity preservation and sustainable use in activities of the related branches of economy, although since 2002 implementation of BSAP actions and sub-regional Strategy of the Central Asia sustainable development is in progress. The BSAP activities, with the exception of CEP and KOT, have practically not been integrated in the national plans of the economy sectors. The problem of joint gain of benefits from sustainable biodiversity use has not been studied in the National action program to combat desertification (1996), Action Plan on mitigation of the climate global warming impact; program document “Sustainable development of Turkmenistan, RIO+10” (2002) and “Regional action plan on environment protection for the Central Asia” (2001).
1.6. Coordination of the	In order to implement Convention at regional and sub-

countries at regional and sub-regional levels for implementation of Convention	regional levels, Turkmenistan is cooperating with the Central-Asian countries within the frames of Interstate commission of sustainable development and Regional environmental center of CA. In the field of ecology, together with the Central-Asian countries, the Agreement of intentions between Interstate sustainable development commission (ISDC) and the Central-Asian WWF program on realization of "Econet" in the Central-Asian region has been signed. Regional action plan on environment protection of CA has been developed, National frame program for land resources management (CACILM) and "EIA Guidelines for the CIS and CA countries". The environmental strategy of East Europe, Caucasus and Central Asia EECCA has been adopted; Central Asia special program (CASP), ISDC and International fund of Aral rescue (IFAR) are functioning.

TARGET 2. THE PARTIES INCREASED FINANCIAL, HUMAN, SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL CAPACITY IN ORDER TO IMPLEMENT CBD	
2.1. All countries possess adequate capacity for implementation of priority actions within the frames of National strategies and action plans on biodiversity preservation	Turkmenistan possesses adequate capacity for implementation of priority actions. Limitation of financial, human, scientific and technical capacity is one of the key obstacles on the way of implementation of all Convention articles. Within the frames of realization of international projects, priority actions on biodiversity preservation are being implemented (Supplement III).
2.2. The parties which are the developing countries (in particular, the least developed countries and small island developing countries among them) and countries with transit economy possess sufficient resources for implementation of three Convention targets.	Turkmenistan, having the status of a developing country, focuses mainly on national sources of financing. The national budget of the country allocates cost amounts for scientific biological researches, including biodiversity preservation needs. However, national special-purpose funds or target financing programs aimed at BSAP implementation are absent. Absence of awareness about biodiversity value for the country among decision-makers and public is also an obstacle to successful implementation of the main targeted actions.
2.3. The parties which are the developing countries (in particular, the least developed countries and small island developing countries among them) and countries with transit economy increased resources volume and expanded transfer of technologies, accessible for implementation of Cartagena protocol on bio-security	Turkmenistan is at the initial stage of project offer development on biological security within the frames of Cartagena protocol. Assessment of biodiversity capacity – basic resource of CHM, or mediation mechanism, has been made in the country. General scope of the national capacity parameter for establishing of the future monitoring system that should lead to creation CHM Center is identified. The CHM site model was developed.
2.4. All Parties possess adequate capacity for implementation of Cartagena protocol on biodiversity	At present, available financial, material and technical capacity is not sufficient for implementation of Cartagena protocol in Turkmenistan.
2.5. Scientific and technical cooperation provides considerable promotion of capacity building	International scientific and technical cooperation within the frames of CBD has provided Turkmenistan with considerable assistance in on-sites capacity building, but it is necessary to enlarge cooperation in the field of bio-security capacity increase.
TARGET 3. NATIONAL STRATEGIES AND ACTION PLANS ON BIODIVERSITY PRESERVATION, AND ALSO INCLUDING OF INTERESTS OF BIODIVERSITY PRESERVATION AND SUSTAINABLE USE IN ACTIVITIES OF THE RELATED SECTORS, PROVIDE EFFECTIVE STRUCTURE FOR IMPLEMENTATION OF THE CONVENTION TARGETS	
3.1. Each Party has introduced	Turkmenistan has applied certain efforts in BSAP

effective national strategies, plans and programs for establishing of national mechanism of implementation of three CBD targets and elaborating clear national priorities	introduction into the national economy sectors. Absence of Coordination group on managing and administrating the process of BSAP implementation has complicated gathering of information of main biodiversity components that are needed for assessment and monitoring of execution of CBD obligations by the country. Absence of interdepartmental agreements complicated the process of execution of this global CBD target. Partially executed are the measures on creation of adequate environment, i.e. solving of problems of cooperation, assessment of influence of the national economy branches on biodiversity on the background of reforming o legal issues and seek financial sources.
3.2. Each Party of Cartagena protocol on bio-security has introduced the regulation base aimed at achievement of the Protocol targets.	On 22.02.2008 Mejlis (the Parliament) of Turkmenistan has adopted decree "About joining the Cartagena protocol on biologic security to the Convention on biological diversity". The country started to develop the project application "Capacity building for development of national frame structures on bio-security of Turkmenistan" (2010-2011).
3.3. The interests of biodiversity preservation and sustainable use are included in the related national sector and inter-sector plans, programs and policy.	The national BSAP has not been legally confirmed by the head of the state. Therefore the interests of preservation and sustainable use of biodiversity are practically not reflected in the majority of sector plans (healthcare, oil and gas production, agriculture, trade, tourism and industry) or are weakly presented (education, national program of forestation).
3.4. Dynamic activity efforts are applied on implementation of priorities in national strategies and action plans on biodiversity preservation as one of the means providing realization of the Convention in national scale, and significant contribution to implementation of global agenda in the field of preservation and sustainable use of biodiversity.	On the basis budgetary financing and international donors funding (Supplement III), the country actively implements many BSAP priority activities, although the country is still at the initial stage of implementation of the Convention main targets.
TARGET 4. MORE PROFOUND UNDERSTANDING OF BIODIVERSITY IMPORTANCE AND CONVENTION TARGETS CAME INTO EXISTENCE THAT RESULTED IN BROADER INVOLVEMENT OF VARIOUS LEVELS OF PEOPLE IN THE PROCESS OF CONVENTION IMPLEMENTATION	
4.1. All Parties implement strategy in the field of relations establishment, education and public awareness, encouraging	Executing BSAP actions, the country through mass media and by arranging district seminars has considerably increased the educational level and wide public awareness, including representatives of local communities

its participation and securing its support to implementation of the Convention.	(farmers).
4.2. Each Party of Cartagena protocol on bio-security promotes and enhances awareness increase, education and public participation in activities supporting the protocol.	The process of project application "Capacity building for development of national frame structures on bio-security of Turkmenistan" (2010-2011) is in progress. International donor investments, basing on article 15 of the Convention on access to genetic resources and fair benefits sharing for the use of those *(medical raw of vegetable and animal origin, selection resources, cryo-bank materials, etc.)* could support the intention of the country to make the genetic resources market its leading strategic component.
4.3. Indigenous and local communities are effectively involved in the processes aimed at implementation of the Convention targets at national, regional and international levels.	Local communities (farmers) are not effectively enough involved on-sites in the processes the Convention targets implementation.
4.4. Main participants and subjects of activity, including private sector, establish partnership relations for the purpose of CBD implementation and include the interests of preservation and sustainable use of biodiversity in their sector and inter-sector plans, programs and policy.	Private sector, business-structures and farmers in their activity rely upon the market demands, ignoring the problems of biodiversity preservation, in particular wild relatives of cultural species. Partner relations with private sector for implementation of the CBD targets are not established in the country.

C. CONCLUSIONS

Turkmenistan, having ratified the UN Convention on biological diversity, confirmed its interest in environmental security – priority direction of the state policy of our country. Recognizing Declaration on support of the Convention decisions, Turkmenistan concedes it as one of the key international political documents providing common legal basis of all international agreements on protection of species, communities and ecosystems. Decisions of the Conference of the Parties gave birth to the beginning of mechanisms formation of reconciliation of biodiversity preservation with sustainable development. In spite of the current status level of national Strategy and Action plan on preservation of biological diversity, the country has executed certain part of the planned activities (49,0%). In the course of profound review of national strategies and action plans in the field of biodiversity, a plan of additional measures was studied (Monitoring and assessment …, 2008). Implementation of current and scheduled activities of national BSAP (2002 and 2008), NEAP and standards of environment impact assessment (EIA) make it possible to partially realize certain tasks of CBD Strategy plan and World summit on sustainable development by 2010.Monitoring and Strategy and action plan on biodiversity preservation implementation effectiveness assessment conducted in the country (2008) and establishing of site model on Clearing-House mechanism, have formed positive environment for sharing information on experience in CBD implementation. The key indicator of monitoring was the national biodiversity monitoring system, a component of CHM structure. Existing state reserves and sanctuaries are the supporting units of the national monitoring system. According to international methodology developed for the World Bank and WWF the process of effectiveness management control for protected areas of Hazar and Badhyz reserves is initiated.

Being a Party of CBD, Turkmenistan automatically became a participant of international FAO agreement on plant genetic resources for food manufacture and agriculture (2007) and a Party of Regional strategy of preservation, replenishment and use of plant genetic resources for foodstuffs and agriculture in Central Asia and Trans-Caucasus for the period till 2015 (2007), as internationally agreed structure, comprising strategic priorities of sustainable use, development and preservation of genetic resources for foodstuffs production.

Considerably feasible is a contribution of Turkmenistan in preparation of the third edition of Global outlook in the field of biodiversity. In November 2006 in Ashgabat, at the international ISDC forum the Sub-regional frame “Convention on environment protection for sustainable development of Central Asia” was adopted. On 22.02.2008 the Parliament of Turkmenistan adopted decree “About joining the Cartagena protocol on biodiversity to the Convention on biological diversity and to Ramsar convention on wetlands”. The process of development of project application “Capacity building for development of national frame structures on bio-security of Turkmenistan” (2010-2011) is initiated. Turkmenistan, as the 159 Party of Ramsar Convention on wetlands, officially joined it on 03.03.2009. Preservation of biological diversity; information exchange; sustainability of PA ecosystems and solution of such problems as biodiversity and climate change, invasive species threat, taxonomic initiatives and development of the Strategy on biodiversity, aimed at securing the sovereignty of our natural resources – remain the national priorities of Turkmenistan.

The existing system of nature protection continues to be strongly influenced by production branches of the economy (Ministry of water economy, Ministry of agriculture, Ministry of oil and gas, etc.), that leads to the habitats environmental instability for all elements of biological diversity, including a man. Therefore, one of the priority tasks of MNP is securing functioning of the National Information center as a tool of interstate cooperation and reporting to Convention on biodiversity. Sustainability of the mediation mechanism (CHM) will permit to build capacity in the country for information exchange on biodiversity,

inside and outside of the state. Making economical assessment of the services, provided by PA system is also important for today. Turkmenistan shares opinion of all CBD Parties that the value of biodiversity is defined first of all by economical value of genetic resources, role of ecosystems and landscapes in sustainability of the country economy. By introducing economic incentives, the country is ready to force the user to decrease loadings on biological resources and biodiversity. Economic assessment of environmental services can demonstrate possible benefits from direct use of their resources and from environment-forming functions.

The State commission on legislation enhancement and Interdepartmental commission on securing execution of international obligations of Turkmenistan in the field of human rights, act as a contribution of the country in the target implementation. According to the international law standards priorities, monitoring of the existing legislation and its upgrading in accordance with the international standards are of big importance in the activities on fulfillment of international obligations.

Better understanding of the Convention role in life of different people levels emerged in the course of BSAP implementation. Various organizations of the civil society have been actively participating in implementation of the scheduled BSAP activities on biodiversity preservation, but unfortunately without participation of the private sector. Involvement of local communities (farmers) in the work at national level was also limited. It is very important for the country to have big amounts of takings resources, both from internal and external sources to increase financial and scientific capacity. Unfortunately, subjects on preservation and sustainable use of biodiversity are weakly reflected in the work plans of the majority sectors of economy. The mass media programs on increase of educational level and public awareness and understanding of biodiversity are functioning in the country.

Thereby, on the basis of BSAP monitoring and assessment of CBD decisions implementation, the country has quite convincingly represented all results and problems related to planning process in the field of biodiversity of Turkmenistan in the Fourth report.

APPENDIX I. Information on the reporting party and preparation of the national report

A. Reporting Party

Contracting Party	Turkmenistan
NATIONAL FOCAL POINT	
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Full name of the institution	***Ministry of Nature Protection of Turkmenistan***
Name and title of the contact officer	***Jumamurad Saparmuradov, Deputy Minister of Nature Protection of Turkmenistan***
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	

CHIEF EDITOR
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EXECUTING OFFICERS
Jumamurad Saparmuradov (Head)
Galina Kamahina (National Expert)
Shirin Karryyeva (National Expert)
Alexandr Yennik (translator)

SPONSORING AGENCY
Global Environmental Facility

APPENDIX II – Source of Information

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APPENDIX III – RESULTS OF TARGET TASKS IMPLEMENTATION

Preservation and support of national biodiversity is put forward as important criteria of sustainable economic development of Turkmenistan, as of the components of Global target of the Convention on biological diversity.

a) GLOBAL STRATEGY OF PLANTS PROTECTION

Target task 1. Preparation of openly accessible list of known plants as a step on the way of making world flora complete inventory

Significant scientific material on flora and vegetation taxonomy (7064 species) has been accumulated, which for today is not fully transferred yet on electronic media and due to this is not easily accessible for foreign countries (Flora of Turkmenistan, 1932-1960; Turkmenistan plants Identification guide, 1988; systematic processing of separate families and genus; incomplete lists of the reserves plant species). Floristic diversity of such natural areas as Sundukli and Karakum, North-West, South-West and Central Kopetdag, Big Balhan, Badhyz, etc. deserts has been discovered at ecosystem level that permitted to identify boundaries of bio-geographical zoning of the country territory. The process of materials storing for preparation of genetic fund Cadastre of the country continues, in which general lists of plant species and list of endemic rare species of the whole Turkmenistan territory will be represented. Further investigations on flora composition inventorying are needed in the conditions of climatic shifts, applying GIS-system. This will permit to identify exact coordinates of rare plant species habitats, with subsequent monitoring, and to fix the time of the alien species invasion.

Taxonomic center – keeper of initial scientific documents on flora biodiversity is the NIDFF herbarium fund (more that 250 thousand leafs, including types and isotypes of 36 species) of higher plants, and also mycological, lichenological and bryological herbarium, collected on the territory of Turkmenistan (including protected areas) and adjusting Iran.

Target task 2. Preliminary assessment of the state of affairs in preservation of all known kinds of plants at national, regional and international levels

The UN Commission on sustainable use has outlined percentage of vanishing species to the total number of local species as one of the indicators of biodiversity preservation (Directory …, 2002). Despite considerable efforts applied during last years, many kinds of flora and fauna of Turkmenistan have vanished, before a man could estimate and provide their use and sustainable management of biological resources. Preliminary conditions in preservation of all known plant species at international, regional and national levels is given in the national Red Data Book (1999). Critically endangered or having a status of “rare” are 109 plants (fungi – 3, lichen – 5, moss – 2, filices – 6, gymnosperms – 1 and flowering plants – 92), or 1,54% of total flora composition, the major part of which (64 species or 59%) are endemics. The national Red Data Book contains 18 species of the Turkmen flora out of 29, included in the IUCN Red List – 1998. 28 plant species area attributed to the category I of

vanishing or endangered units. Part of 71 plants specimens are protected in the territories of existing reserves and sanctuaries.

The new International red list (IUCN; 2007) comprises 11 arboreal kinds of plants of Turkmenistan territory. It is Bukhara almonds *(Amygdalus bucharica; VU)*, bristly kandym *(Calligonum setosum (C.molle); EN)*, Paletsky kandym *(Calligoum paletzkianum; VU)*, walnut *(Juglans regia; NT)*, Caucasian carcass *(Celtis caucasica; LC)*, common fig *(Ficus carica; LC)*, pistachio *(Pistacia vera; NT,)*, grey-leaf poplar *(Populus pruinosa; NT)*, pomegranate ordinary *(Punica granatum; LC)*; tamarisk Androsov *(Tamarix androssowii; LC)*, Turkmen subspecies of of Sivers apple-tree *(Malus sieversii ssp. turkmenorum)* as kinds with high phytocenological importance in stabilization of arid ecosystems. Purposeful work on current state revealing of endemic and rare plants of Turkmenistan, and also all known arboreal forms is necessary.

Target task 3. Development of models and procedures of preservation and sustainable use of plants on the basis of scientific researches and practical experience

Special models of preservation and sustainable use of plants are not developed in the country, also absent are the integrated management plans of juniper *(Juniperus turcomanica, J. zeravschanica)*, deciduous *(Acer turcomanicum, Amygdalus turcomanica, A, communis, Cercis griffithii, Crataegus sp., Cotoneaster sp.,* etc.) and tugai forests *(Populus, Salix, Ulmus, Fraxinus, Tamatix)* with regard of local economic and social conditions. The rules on wood harvesting, limits of gathering for wild-growing medicinal and food plants based on results of scientific researches and practical experience are in force in the country.

Target task 4. Effective preservation of minimum 10 percent of each environmental region of the world

The PA fund is represented by 8 state reserves and 14 sanctuaries (nearly 4% or 1916,03 thousand hectares). The area of the protected territories remained unchanged during the last 10 years. Protection of Turkmenistan biodiversity is secured within the borders of PA natural ecosystems of the three provinces: Turan *(Repetek, Amudarya and Kaplankyr reserves)*, Mountain-Central-Asian *(Koytendag reserve)* and Kopetdag-Horasan *(Syunt-Hasardag and Kopetdag reserves)*. Preserved also are the ecosystems of *Badhyz reserve* lying on junction of Karakum desert, Kopetdag-Horasan mountain system and foothills of Parapamiz, and *(Hazar (former Krasnovodsk) reserve*, where typically dry trans-Caspian desert contact the east part of the Caspian sea (Review of Turkmenistan reserves). At present the wetlands of sea ecosystem PA area is 268 thousand hectares, or 14%; river – 152,5 thousand ha, or 7,6%, mountain ecosystem – 428,05, or 22,3% with rich content of endemic kinds (18%), dry sub-humid lands – 1 037,6 thousand ha, or 54,2% of the total PA area.

Target task 5. Protection securing of 50 percent of the most valuable regions from the point of view of plants diversity

The net of specially protected areas (PA) existing in our country is not capable yet of securing protection of 50 percent most valuable regions from the point of view of plants diversity. The leading place in main PA ecosystem is occupied by plain-desert ecosystems (56,9%), the national symbol of those being black saxaul *(Haloxilon aphyllum)*. On the rest part of the territory, mountain (15,5%), river (15,5%) and sea (9,7%) ecosystems prevail, which according to their total area make 40,7% of the PA area, considerably representatively

reflecting biodiversity richness and variety. Wetland (near-water) and tugai-valley complexes make one ninth part(11,9%) of the total area of protected territories. Considerable part of protected natural territories of forest plantation has either preserved potential of natural self-regulating function, or can easily be restored in certain conditions of partial load mode farming. At decrease of anthropogenic pressure, the landscape fragmentation and rebirth of the natural dynamics of prevailing ecosystem types are quite reversible.

The Ministry of Nature Protection has developed "Perspective plan of development of the net of specially protected natural territories of Turkmenistan", According to this plan, the PA future is – upgraded territories with different protection mode (permanent and temporary) Zoning principle will be combined with inclusion in the net of the environmental restoration sites. A national park (second IUCN category) will become a major nature protection element, the basis of which will be represented by the existing reserves (first IUCN category). In future the PA area will be 30,8% of the total country area. This will promote to arrange protection of the most valuable sites of plant biodiversity. Implementation of the regional ECONET will permit to change situation practically by establishing territories of regulated nature use on 50% of the country area. This will be the most valuable event for biodiversity natural sites, half of which are the existing reserves representing the "cores" of environmental structure. According to international methodology developed for the World Bank and WWF, the process of management effectiveness control for protected areas of Hazar and Badhyz reserves is initiated.

Target task 6. Regulation of at least 30 percent of production lands in accordance with purposes of plants diversity preservation

The total area of the state forest fund (SFF) of Turkmenistan is 20,3% of the country area (49 120 thousand hectares). Forested area is 41% of the SFF area, or 8,1% of the country area. Mountain forests (524 thousand ha) are attributed to the I category forest areas, with very limited area of juniper light forests and especially fruit crops *(Malus, Pyrus, Prunus, Crataegus, Sorbus, etc.)*. The largest areas are occupied by desert (9351) and tugai (44,5 thousand ha) forests.

Considerable portion of the country forest fund is used for pasturing. In plain ecosystems arable lands occupy 95% of the agricultural lands area (40.2 million hectares). Up to 90% of sand desert territory is intensively used for distant cattle-breeding. According to the season of use, pastures are divided into winter, spring-autumn and summer types. Prohibition of forest logging from 1991 (only sanitary cuttings are allowed), and also provision of population with natural gas promoted preservation of saxaul forests *(Haloxylon aphyllum, H. persicum)* in desert ecosystems of Karakum (13,7 million ha). However, intensive grazing and long-term wood cutting for fuel purposes led to negative consequences. Pastures of mountains and foothills plain are subject to various degrees degradation of the vegetative cover. This leads to the soils water erosion. The share of eroded soils in the mountains is up to 87% (Esenov, Durikov, 2007).

At present many rare and endemic plant species are preserved in PA areas: 8 state national reserves (including one biosphere), 14 state natural sanctuaries and 17 nature monuments. 89% of the composition of animals (136 species, of them 43 – IUCN); 62,6% plants (72 species, of the 14 – IUCN) from the Red Data Book of Turkmenistan are preserved in the PA territories. And, what is important, 28 species are presented by one or very little number of populations, each being endangered.

The country has created conditions for transit to the legalized regulated form of the PA territories resources running, having preserved the core sites of the reserves from the outside pressure. The Ministry of Nature Protection of Turkmenistan is conducting works on

development environmental and economic justification for the projected Archabil (Central Kopetdag) and Sumbar (South-West Kopetdag) national parks of nature.

Target task 8. Preservation in ex-situ accessible collections, preferably in the country of origin, of 60 percent of endangered plant species and including 10 percent of such plants in programs on species restoration and reproduction

In live collections of Ashgabat Botanical garden at the municipal council of Ashgabat, certain rare species of local flora are maintained but unfortunately, in a very limited number (not more than 2-3% of flora composition). Due to transfer of Ashgabat Botanical garden to the system of the Academy of Sciences of Turkmenistan (12.06.2009), the situation should be positively changed.

Target task 9. Preservation of 70 percent of genetic diversity of agricultural crops and other basic plant species of social and economic value, and also support of the related indigenous and local knowledge

The unique genetic bank of wild fruit crops of Mahtumkuli Scientific Production Center of plant genetic resources (MSPCPGR) is a national heritage of Turkmenistan. In the zone of dry subtropics, during the period of 70 years work, many generations of scientists have collected 4040 specimens of fruit trees – relatives of crop plant species of the Central Asian genetic center. 450 plant specimens of Turkmen and 1000 specimens of the regional origin were sorted out from genetic Bank. By the beginning of the new century, the MSPCPGR genetic fund of some crops grew considerably poorer.

Following the results of the 2004 inventory for today live collection of MSPCPGR is represented by 1937 specimens: 890 samples of pomegranate, 419 grapes, 137 apple-trees, 101 olives, 92 figs, 91 persimmons, 59 unabi, 43 pistachios and 34 samples of pear. In 2006 the nursery of grapes, fig, apple-tree, pomegranate, apricot and persimmon saplings was founded which will become a basis for arrangement of future collections.

In 2005, in the Center territory on the area of 0,5 hectares the nursery for reproduction of the best specimens of apple-tree and their distribution among farmers (5,5 thousand stocks) has been founded. Documentation of the collection is made and 15 best local and foreign kinds of apple are sorted out. The indigenous core of MSPCPGR genetic fund is represented by 8 fruit crops (pomegranate, apple, pear, plum, fig, pistachio and almonds) and grapes - 186 native species-types and 223 wild-growing forms of the Turkmen origin, that makes 24,7 % of the general structure of the collection. This information resource is important for activation of the process of use of genetic plasma by local farmers in their work on domestication.

In national collections of scientific research institutes more than 100 age-old kinds and forms of national selection of 19 species of basic cultural plants have remained. The food-processing industry uses raw materials of 53 kinds of wild-growing and cultural plants. The register of cultural plants species of Turkmenistan includes kinds of white wheat, rye, leguminous plants (peas, string bean, chick-pea), bean (lucerne), melons and gourds (melons, water-melons, pumpkin), vegetable (onion, carrot, tomatoes), technical (licorice, chalk plant, tragacanth locoweed, etc., more than 700 kinds) and more than 100 decorative kinds of plants, and also medical herbs.

Target task 10. Introduction of plans to combat at least 100 main alien species, which threaten plants, plant communities and the related habitats and ecosystems

The country executes certain works on prevention of invasion, control or destruction of kinds threatening ecosystems and natural habitats. Responsibility for penetration prevention of invasive species is born by the customs, inspection on plants quarantine and CaspEcoControl service. The Ministry of Nature Protection draws the conclusion on offers on acclimatization of kinds of plants new to Turkmenistan. Import and cultivation of plants is executed on the basis of coordination under the control of the State inspection on plants quarantine of MA.

Adventive (weed) fraction of Turkmenistan flora makes 20 % of the general structure among which 39 new advent-kinds (entry) and 20 refugees from culture are noted. Uncontrollable colonization of ailanthus the highest *(Ailanths altissimus* (Mill) Swingle) is observed, which began to take root into some natural communities. In the territory of neglected gardens in many canyons of Southwest Kopetdag, running-wild of some cultural or cultivated kinds is noted, as an example of re-domestication (Levin, 2008). Successful invasion of exotic weeds is probably connected with presence of free environmental gaps in crops of cultural plants and disturbed habitats.

Introduction of plans of combating alien species are possible after establishing corresponding information Database in the system of national Clearing-House Mechanism (CHM). Long-term investments into development of existing infrastructures are necessary for enhancement of possibilities of national taxonomic researches in respect of the Global initiative. Partner cooperation and injection of additional financial resources in enhancement of taxonomic capacity will promote creation favorable environment for implementation of the international program on Global taxonomic initiatives in the country.

Target task 11. Neither of the wild flora species shall run the danger of international trade business

Turkmenistan is not a Party of the Convention on International trade in endangered species of wild flora and fauna (CITES), but strictly follows all its demands. At present not a single species of wild flora of Turkmenistan is a subject of international trade to the extent that really endangers its existence. MNP is controlling gathering and export of plants, entered into the CITES list, through the customs service.

Target task 12. Getting 30 percent of vegetable origin products from the sources with sustainable management

Sustainable management of the products of vegetable origin, acquired form wheat thrashing yield and harvesting fruit crops (apple, pomegranate, pistachio), melons and gourds (water-melons, melons, pumpkin) and vegetables (tomatoes, cucumbers, pepper, carrot, onion) is established in the country. Nature management by direct consumption of biodiversity resources does not have big economical importance for the country and is essential only at local level or for certain categories of the population.

Target task 13. Termination of plant resources exhaustion and loss of the related indigenous and local knowledge, innovations and practice, which support sustainable life activity, food supply at local level, and healthcare

The country has preserved traditions of sustainable use of biodiversity. Widespread program on denationalization and privatization of state property is aimed at restructuring of

farming without direct assessment of the local farmers' knowledge and practices, and their ability for innovations. The legal standards on protection of the right of farmers, engaged in harvesting of local breeds of agricultural crops and their wild relatives are absent in the country. The problem of protection of indigenous communities (farming) is not reflected in any of the existing legal documents. Properly arranged stock assessment and control on medical plants use are also absent.

The greatest damage to nature was caused by wood cuttings. But after gasification of nearly all settlements of the country, the process of plant resources exhaustion has declined. The national program on landscape gardening has well progressed in the country. The program is fixed by the related decrees of the President of Turkmenistan: *"About creation of park zone at the foothills of Kopetdag"* (1998), *"About development of gardening and planting of greenery in Turkmenistan"* (1999) and *"About measures on further development of environment state and creation of favorable climatic conditions"* (2000). Activities on this program were aimed at creation of woodland parks in the foothills of Kopetdag, thus reviving national traditions of mass tree plantings.

Target task 14. Covering in communicational, curriculums and educational programs of the issue of plant biodiversity importance and necessity of preservation

The standard curriculums of the majority of secondary schools and institutions do not comprise a special program on study of "Biodiversity preservation" theme. Partially similar issues are examined in a number of basic subjects of natural science character, as "Botany", "General biology". Lack of textbooks, demonstration materials; problem of translation of available materials into the Russian and Turkmen languages – all this affects the level of population awareness in the field of biologic diversity preservation. Local mass-media and TV execute considerable amount of public work in the field of information sharing on biodiversity preservation issues.

Target task 15. Number increase, with regard of national demands, of professionally trained specialists for implementation of target task of this Convention, capable of working in the institutions dealing with the plant preservation issues

In connection with the Academy of Sciences of Turkmenistan revival (2008), there started the works on high qualification specialists training (candidates and doctors of sciences) on ecology and biology as obligatory block of natural scientific subjects. It will permit to increase the staff of specialists dealing with the plants preservation problems. In accordance with the Decree of the President of Turkmenistan dated 12.06.2009, scientific capacity of the AS of Turkmenistan will be represented by 12 scientific-research institutions, including the Institute of Botany with botanic laboratories of NIDFF, Central Ashgabat Botanical Garden, live collection of fruit crops of MSPCPGR (the former Karakala experimental station of the national institute of crop production) and plant genetic bank of the National Museum of Turkmenistan "Ak Bugdai" (White wheat).

Target task 16. Establishment and enhancement at national, regional and international levels of networks on implementation of activities on plants preservation

The PA system is operating in the country (reserves, sanctuaries, nature monuments) with plants protection function. The tendency of development of integrated natural territories management with participation of population living inside or around them is observed. Establishment of integrated environmental net ECONET, combining functions of nature

protection and economic development, was drafted within the frames of GEF-UNEP-WWF project for the countries of Central Asia (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Turkmenistan).

b) PROTECTED AREAS WORK PROGRAM

COMPONENT 1. DIRECT MEASURES ON PLANNING, SELECTION, INTRODUCTION, ENHANCEMENT OF PROTECTED REGIONS AND SITES SYSTEM AND THEIR MANAGEMENT

Target 1.1. Establishment and enhancement of national and regional system of protected regions, included in the global network as a contribution to implementation of globally agreed targets

The reserve fund of Turkmenistan occupies approximately 4,0% of the country area and since 1998 is a component of Pan-European strategy on biological and landscape preservation – a mechanism of CBD implementation. To implement global target tasks in protected areas, BSAP has fixed main target – expansion of the protected areas network to 6% by the end of 2008 and ensuring effective management. This target task was presented with consideration of global importance and international recognition of the protected areas network being formed.

In national target task (strategy component A) main attention was paid to preservation of species in their habitats (in-situ) by enhancement of management quality and sustainable use of the most important ecosystems of protected areas, preservation of rare species and migration corridors, increase of local population role in protected areas management, etc. (5 actions, 34 activities). Natural protected areas of Turkmenistan are a component of integrated environmental monitoring system, where assessment and control of biological diversity structure are ranking high. Development and formation of the network of globally important protected areas was executed with support of donor institutions at participation of public and scientific organizations.

On the coast of the Caspian sea, essentially new system of protected area management is being developed, targeted at preservation and sustainable use of Hazar reserve biodiversity. Making use of scientific achievements with regard of local demands and traditions of the population, close partnership of nature protection institutions with commercial structures – users of natural resources, enable people of the region to take the most active part in solution of environmental problems and environmental education on the background of widespread public awareness, and to solve nature protection state objectives without infringement of the local population interests. Since 2007 in the territories of Hazar (2007-2009) and Badhyz (2009) reserves the process of testing of international methods has been launched developed for the World Bank and WWF on use of management effectiveness control instrument for protected areas. In future this instrument will be used in the other PAs. Considerably high level of management is noted for Badhyz reserve. The process preparation of phase A project “Development of protected areas of Turkmenistan” is ongoing.

Target 1.2. Inclusion of protected areas in broader landscapes, seascapes and sectors for support of their environmental structure and functions

The process of integration enhancement of protected areas in wider landscapes is reflected in a set of projected BSAP measures (3 actions, 10 activities) and has been targeted at enhancement of the protected areas system (A2-A4). The scheduled actions resulted in regional project "ECONET establishment for long-term biodiversity preservation in the ecosystems of Central Asia" for the period 2003-2006, implemented by WWF in cooperation with the governments of these countries. Existing national network of protected areas was included into the projected ECONET network for long-term biodiversity preservation in Central Asia. Adequate preservation of rich biological diversity of the country will be achieved through the territories of regulated nature use which, being integrated in the general land use system, take into account the local population interests. Environmental network of Central Asia included protected areas with various modes of use in landscapes of the whole region, having combined nature protection interests with the demands of economical development of the region.

The regional project "Key ornithological territories of Central Asia" (2005-2998) serves the purposes of protection of the territories covering the most representative habitats of birds (A.2.3.; A.5.10.; BSAP) and especially critically endangered species. A quarter of key territories overlap the Econet of protected areas. This nature protection program started in Turkmenistan by the end of 2004; the process of outlining and specifying of key ornithological territories has already been completed. The set of documents is prepared for nominating of 50 sites to the status of International key ornithological territories.

Turkmenistan is also a part of the Network on genetic plant resources (GPR) of Central Asia and Trans-Caucasus (CATCN-PGR), and together with UNEP, International institute of genetic plant resources (IPGRI) and International Center of agriculture research on dry territories (ICARDA) started implementation of regional Strategy on preservation and sustainable use of national agro-biodiversity, i.e. preservation of species in their habitats (in-situ) and outside (ex-situ).

Target 1.3. Establishment and enhancement of regional networks and trans-boundary protected regions by means of arrangement and strengthening of cooperation between neighboring protected regions outside of the national border limits

Six of 8 existing reserves in Turkmenistan have protected frontier territories, but neither of the reserves is a trans-boundary protected region of regional Econet. At the international MAB-UNESCO seminar (10-12 May 2008) in Ashgabat with participation of the Ministry of Nature Protection, a number of recommendations and offers have been elaborated aimed at implementation of Madrid action plan "From Seville to Madrid". In particular, "to propose to nominate units of trans-boundary protected areas as trans-boundary biosphere reserves and objects the UNESCO World natural heritage" (Karryyeva, 2008). In 2007 the Agreement on intentions between ISDC and Central Asian WWF program on implementation of "Econet" in the region has been approved. Also proposed at MAB-UNESCO seminar was "to establish sub-regional environmental net for enhancing the existing nets operation and involvement of the rest countries of the region". Signing of the *"Memorandum of mutual understanding on preservation, restoration and sustainable use of saiga"* provides possibility of trans-boundary cooperation of Turkmenistan with Kazakhstan and Uzbekistan on the problem of preservation of saiga and its habitats along migration routes, places of wintering and summering.

Target 1.4. Enhancement of protected regions planning and management with due regard of local specifics

The BSAP work program on protected areas is aimed at increase of efficiency of their management. After ECONET implementation by 2012, protected areas of the country will execute not only nature protection function, but will also provide possibility for recreation and non-destructive nature management at considerable part of their territories. The regional ECONETWORK will connect through environmental corridors *(for genetic exchange between populations)*, buffer zones and zones of environmental restoration strictly protected cores *(territories of existing reserves)* with each other and trans-boundary protected regions behind the national borders limits. This will secure introducing ecosystem approach and enhance international nature protection cooperation. Establishment of PA network will become a precondition for the country's transfer to sustainable land management, because considerable part of natural areas has preserved capacity for self-regulating function, or it can easily be restored. Landscapes fragmenting and revival of natural dynamics prevailing ecosystem types is absolutely reversible at decrease of anthropogenic pressure. The process of use of international instrument of the management effectiveness control for the protected areas of Hazar and Badhyz reserves has started.

The National park of nature (NP), more corresponding to the modern world practice in nature protection and permitting to combine nature protection with its rational use, will become a basic element of the protected areas system of the country. In the near future Archabil and Sumbar NP will be established in Kopetdag, with the related network of environmental corridors *(for example, Ipaykala)* and buffer zones *(Dushakerekdag mountain).* The country has prepared justification (set of documents) for establishing of Balhan (in the mountains) and Central-Karakum (in the desert) reserves, objectives priority of which is confirmed in NEAP and BSAP *(A.3.1.; A.5.2.; BSAP)*. A set of documents on nomination of Badhyz, Repetek, Amudarya, Hazar, Syunt-Hasardag and Koytendag reserves is being elaborated at present within the frames of demands implementation of the Convention on World natural and cultural heritage (1994).

For implementation of the target tasks on protected areas, 19 projects and a set of actions have been executed (section 2.4.). The most complete information on the reserves of Turkmenistan is published in the collection "Reserves of Central Asia and Kazakhstan" (2006), edited within the frames of the regional IUCN project "Assessment of management efficiency of protected natural areas of Central Asia". Information is open to public: (http://iucnca.net).

Target 1.5. Prevention and mitigation of unfavorable consequences of main threats endangering protected regions

Within the frames of strategy component J "Impact assessment" BSAP a set of actions is projected aimed at surveying the methods of biodiversity impact assessment (J.1.1. – J.1.3.), and development of impact control mechanism for all sectors of national economy on biodiversity (J.2.1. – J.2.5.). The global environmental fund has provided support to our country in priorities assessment for enhancement of national capacity and achieving sustainability in biodiversity preservation and increase of professional standards.

Detailed assessment of threats and capacity estimation were given within the frames of the project "Capacity assessment for implementation of the UN global environmental conventions" (2006). Main priorities of national strategy on capacity support in the field of biodiversity have been identified: level increase of legal capacity; enhancement of activities in the field of international and national cooperation, management and monitoring; activation of taxonomic initiatives and strengthening of material and technical base of scientific researches; development and introduction of work programs on invasive alien species monitoring; increase of environmental educational level and public awareness through its involvement in

nature protection activity *(Thematic reviews//Capacity assessment for implementation of the UN global environmental conventions, 2006).*

COMPONENT II. MANAGEMENT, PARTICIPATION AND JUSTICE IN BENEFITS SHARE

Target 2.1. Promotion of justice in benefits sharing

Concept of justice and equity in benefits sharing at sustainable use of biologic resources in buffer zones and adjusting PA territories is reflected in thee BSAP strategic component L "Legislation". The country has not started its implementation yet. Though importance of this BSAP component, capable of providing fair costs and benefits distribution related to establishment of protected regions, has constantly been passed through all implemented projects. Reforming of legislative base, including BSAP legal status, will make it possible to activate the process of actions implementation, aimed at fair benefits share on the basis of equity of all subjects of activity.

Guiding local communities on environmentally safe kinds of activities (environmental tourism, limited gathering of medical herbs, wild-growing fruits and berries, including their processing, use of alternative energy sources) and getting monetary reimbursements for limitation of activity in PA contact zones will promote to implement in practice participation of local communities in protected areas management, preserving their rights and obligations.

Target 2.2. Increase and ensuring participation of local communities and the related subjects of activity in sustainable use and reproduction of the biological diversity resources

Till present the mechanisms of involvement of private sector in implementation of sustainable use of biodiversity initiatives, especially protective and restoring actions, are not developed in the country. But even in cases of private sector involvement in use of biological resources (hunting and fishery), the mechanisms of protection and restoration are not established. The analysis of key legal aspects of Turkmenistan on problems of farmers protection, as biodiversity keepers, has shown that certain measures (including legislative) on preservation of genetic diversity of all agricultural crops and local breeds providing country's food independence are absent in the country. The legal documents do not comprise the issue of genetic biodiversity resources preservation and obtaining benefits from their use. The legal norms on nature protection and forest property, in particular national property right on genetic resources and their wild relatives are not identified either.

At the same tome, the country has already gained the first positive experience in increase of public awareness in establishment of Sumbar national park of nature. The program of population environmental education within the limits of sustainable development of West Kopetdag region has been developed and spread around the whole country regions. A number of nature protection educational workshops, with booklets, brochures, environmental leaflets and photos have created environmental and educational supporting environment among local population.

COMPONENT III. PROMOTIONAL ACTIONS

Target 3.1. Adopting of promotional policy, securing of organizational and socio-economic environment favoring protected regions

The country has just begun to develop the tools of economic assessment and registration of bio-resources. The process of involvement of local community in protected areas management is weakly arranged, although there exists the practice of providing small grants to the local communities and measures on penalty sanctions for violation of nature protection legislation are applied. Due to the absence of assessment mechanism of protected areas and their environmental and recreational services input into the country economy and culture, hidden and obvious economic benefits from preservation of biodiversity are not discovered. A number of sectors of economy (forestry, agriculture, hunting, tourism) actively use the biological diversity values without making economical assessment of those.

Target 3.2. Capacity building for projecting, establishing and managing protected regions

At present management of protected areas faces the problems of short-staff skilled specialists, insufficient technical equipment and low-effective management of protected areas. The staff capacity of specially protected natural territories is represented by maintenance department – 41,4%, protection department – 46% and scientific department – 12,6% of the staff that in proportion makes 3,3: 3,7: 1. Lack of specialists of nature protection and reserve business does not promote execution of year-round monitoring, scientific researches and efficient biodiversity protection. Regular retraining system and refresher courses are absent. The main principle of protected areas management is a management plan.

Target 4.4. Development, use and transfer of the related technologies of protected regions

Participation of the country in the UNEP/GEF/IPGRI regional project “In-situ/on farm preservation of agro-biodiversity (fruit crops and their wild relatives) in Central Asia: (PDF-A, PDF-B, 2000-2994; PDF-C, 2006-2010) became an important step on expanding the work on increase of role of farmers communities in solution of state-scale problems. The project is aimed at increase of the farmers and local population capabilities in on-site preservation in-situ/on farm (farmings) of local kinds of fruit crops and their wild relatives, in particular including those of protected areas of Badhyz and Syunt-Hasardag reserves and adjoining sites of Syunt-Hasardag reserve. Its implementation will result in development of tactics of supporting farmers and local population; information and methodology will be presented on in-situ/on-farm, on preservation of fruit crops and their wild relatives. By establishing close contacts of the related institutions with farmers, conditions will be provided for their training and implementation of action on in-situ/on-farm preservation of fruit genetic resources.

Target 3.4. Providing financial sustainability of protected regions and national and regional systems of protected areas

Ensuring financial sustainability of the national system of protected areas remains as a weak link. Each reserve has sufficiently stable budget, but flexibility in managing out-of-budget means is absent. For introduction of the regional system of protected areas and their management (ECONET), the national sources for covering financial, technical and other resources are insufficient, in particular in relation to communication enhancement, education and public awareness in importance and benefit of protected regions. In this connection, it is very important to seek for more active involvement of private sector funding in securing financial sustainability of protected regions.

Target 3.5. Enhancement of communication, education and public awareness

All reserves of the country conduct wide campaign of environmental and education activity intended for forming among wide layers of the society of understanding of modern PA role in preservation of biological and landscape diversity and its place and importance in social and economic development of the region. International actions, as “Parks marching”, “Day of biodiversity”, “Year of crane”, etc. are exercised. The Nature Museums are operating at the reserves. The reserves staff works with public, delivers lectures, arranges picture contests, and cooperates with mass media.

COMPONENT IV. STANDARDS, ASSESSMENTS, MONITORING

Target 4.1. Development and adoption of minimal standards and rational methods for national and regional systems of protected regions

The whole system of protected areas is at the possession of one authority – the Ministry of Nature Protection. Activity of the Ministry is aimed at establishing integrated environmental network. The project document “Perspective network development plan of specially protected natural territories of Turkmenistan” declares that in future the territory of regulated nature management will occupy about 50% of the country’s area. It will promote within the frames of implementation of environmental Econetwork increasing the area of specially protected natural territories. The basic element of nature protection will be a national park of nature, existing reserves being its core.

The ECONET concept is intended for integration of network in the context of regional and national sustainable development plans, and also for engagement of reliable mechanisms of long-term interstate cooperation and coordination of activities. In 2005, according to ISDC decision the concept of regional ECONET has been integrated in the strategy of Frame convention on environment protection for sustainable development in Central Asia. The target of the project is – enhancement of the existing system of protected areas of Turkmenistan with securing protection of the regions not having nature protection status (ECONET – “life net”. Central Asia, 2006). Expansion of the PA network will promote converting of the existing net in a system of monitoring centers, where special place will be allocated to quality improvement of protected areas management – key component of the world natural heritage.

Target 4.2. Assessment and enhancement of protected areas management efficiency

Since 2007, within the frames of the project “Preservation and sustainable use of biodiversity of global value, in Hazar reserve on the shore of the Caspian sea” the process has been started of testing of international methodology developed for the World Bank and WWF on use of efficiency management control instrument for the protected areas. The methodology was used for management efficiency assessment of protected areas in the territories of Hazar (2007-2009) and Badhyz (2009) reserves. In perspective this instrument will be applied in the other PAs. Comparatively high level of management is pointed out for Badhyz reserve. The process of development of phase A project “Development of protected areas of Turkmenistan” is at the stage of progressing.

Target 4.3. Protected areas state and the related tendencies assessment and monitoring

The monitoring system in protected areas is functioning in the country since the first days of its formation, as a system of stationary supervision of certain species dynamics. Quantity of globally vulnerable species – rare plants and animals species entered in the Red Data Book of Turkmenistan and IUCN Red List – is the indicator of data collection for the existing reserves. Data acquisition on biodiversity components is executed on the basis of integrated scientific-methodic manual "Chronicles of nature". According to the scope range, the PA system of Turkmenistan is quite representative; the results of which are represented by the elements of the system environmental PA monitoring, supported by practical traditions of the reserve activity in Turkmenistan. Two species (lebetina viper and Central-Asian cobra may change their status, because their number is being stably restored.

Positive results have been obtained in the process of ornithological monitoring within the frames of the regional project "Key ornithological territories of Central Asia" (Section 2.4.). The unique scientific monitoring document is the Herbarium national fund of the country, where each specimen is a scientific document for conducting monitoring investigations at species and genetic level. Also operating in the country are state programs on environmental monitoring on environment conditions assessment, climate change and desertification processes intensification. Unfortunately these programs do not provide systematic monitoring of these factors impact on biodiversity (in-situ). Further development of scientific knowledge, especially on taxonomic initiatives, will promote work efficiency in protected territories. Environmental and economic justification for establishment of Sumbar national park in Mahtumkuli etrap of Balkan velayat, and Archabil NP in Ahal velayat is in the process of development. Environmental corridors will be established between future national parks (Archabil and Sumbar) with gentle types of regulated nature management. Establishment of new PAs of high nature protective rank is projected in arid ecosystems.

Target 4.4. Ensuring that scientific knowledge promotes creation and maintenance of efficiency of protected areas and networks of protected areas

Reserves are stationary bases on executing scientific researches of the Institute of deserts, flora and fauna (NIDFF) and universities of the country. Small staff of scientific specialists, zoologists, foresters and botanists take part in joint scientific works.

Target 4.5. Analysis of obstacles (barriers), requirements and future priorities in management of national of protected areas system

Implementation of survey and assessment of stimulating environment (Monitoring and an efficiency assessment …, 2008), aimed at enhancement of the protected areas system effectiveness, permitted to identify actions efficiency on implementation of strategy on biodiversity preservation in Turkmenistan within the frames of CBD targets implementation.. Additional BSAP actions (Supplement II) are developed. The global environmental fund has provided support to our country in assessment of priorities for national capacity enhancement and achieving sustainability in biodiversity preservation and development of knowledge and increase of professional standards (Supplement III). According to the international technique developed for the World Bank and WWF, the process of control of protected areas management efficiency has begun.

The basic barrier in national system of protected areas management is defined by the fact, that both, in protected areas and frontier zones infringements of the reserve protection mode are still observed. Especially extended are uncontrollable fishing and shooting of the animals entered in the Red Data Book, cattle grazing in the zones adjoining to protected territories. There is no system monitoring and only assessment of results of management efficiency control of protected areas of Hazar and Badhyz reserves begins to be introduced. Ecotourism strategy in protected areas is not developed and the local population almost does not participate directly in taking decisions related to PA management. It is necessary to study possibilities of conclusion of cooperation agreements between PA and Turkmenmallary Association.

Insufficient budgetary financing of the protected areas system, professional knowledge level of PA staff and managing structures, weak sector and inter-sector cooperation in the issues of biodiversity preservation are the obstacles in effective solution of the problems of biodiversity preservation and decrease of dander of biodiversity loss.

It is necessary to develop actions targeted at involvement of local communities and territorial managing authorities in expanding the inter-sector program on sustainable development of certain regions of the country.

SUPPLEMENT I. RESULTS OF CP-8 DECISIONS IMPLEMENTATION

In the light of implementation of CP-8 conference decisions (VIII/5; article 8), Turkmenistan submits to the CBD secretariat the following reports.

a) Work report on results of local communities involvement in actions at national level

In the process of development and preparation of the Fourth national report, the related capacity has been established with wide participation of local communities and persons of state and regional level. Discussion of all questions with involvement of local population has enabled not only to make clear importance of the Convention articles to all process participants, but also to promote broad discussion on probable ways of their solution at local level. The representatives of the governmental delegations of Turkmenistan took active part in working and consultative meetings of Conference of the Parties of CBD, SBSTTA and others.

b) Work report on deep-water genetic resources of the Caspian sea

Within the framework of the "Caspian Environmental Program" project, which is the leading form of international nature protection cooperation in the Caspian sea region since 1998, Turkmenistan has developed the national Caspian action plan, Key role in development and implementation of NCAP is played by Trans-boundary diagnostic analysis, Strategy action program and national sector plans. Each of them is aimed at taking measures on immediate regulation of unfavorable impact on deep-water ecosystems and species in these regions with the purpose of preservation and sustainable use of resources in accordance with the demands stipulated in item 56 of CBD VII/5 and VIII/21 decision. Preventive actions, aimed at improvement of the Caspian sea ecology are implemented within the CEP framework, in particular the project *"Establishment of operations control service on navigational channel depths and securing environmental safety in Turkmenbashi bay of the Caspian sea"* (2002-2003).

The following items are referred to the problems of preservation of deep-water genetic resources, demanding special attention within the frames of the Turkmen NCAP:

- Rational management of commercial bio-resources, especially sturgeons, on the basis of biological diversity preservation;
- Ensuring environmental safety of economic activity, including pollution control (inclusive of oil) and reaction in cases of emergency;
- Environmentally sustainable development of coastal zones, combating land degradation and desertification;
- Enhancement of environment management in the region, including development of the network of specially protected natural areas and water areas, adequate provision of information for taking decisions, public participation.

Participation of Turkmenistan in development of Protocol on preservation of the Caspian sea biodiversity, Protocol on ground sources of the Caspian sea contamination, Protocol on impact assessment on the Casian sea environment and Protocol on the cases of emergency is aimed in whole at implementation of the complex management of sea and coastal Caspian regions (VIII/22 CBD).

c) Work report on measures on integrated Caspian marine and coastal regions management implementation

The Rules of protection of the coastal waters of Turkmenistan against sea-vessels pollution and Instruction on cooperation in emergency conditions at large spill of oil products in Turkmenbashi port water area and its region are valid in the coastal areas of the Caspian sea. But certain measures taken for the purpose of implementation enhancement of complex sea and coastal regions management are absent. Therefore during NCAP development, the problem of necessity to develop special programs on coastal territories integrated management was separated out. Implementation of these programs should decrease to minimum the anthropogenic destruction of habitats, soil surface disturbance, territories desertification, that in the result could lead to preservation of coastal areas species diversity.

For decrease of anthropogenic impact of the Caspian biodiversity NCAP considers necessary the following:

- Establishment of scientific-research center on Caspian;
- Taking measures on elimination of paramount reasons of the sea contamination by wastes of oil, chemical, domestic and other industrial facilities;
- Development and implementation of alternative kinds of local population economical activity, aimed at the other sources of getting income. This will promote decrease of anthropogenic loading on adjacent area and more rational use of sea and coastal bio-resources.

For implementation of the work program on protected areas in accordance with target 2.2 (VIII/24 CBD), the country has been provided with international financial support within the frames of 19 projects (Supplement III). Within the framework of Global initiative on protected areas at CP-9 CBD, “Biodiversity and desertification” have been recognized as priority subject area of GEF-5 financing.

SUPPLEMENT II - ADDITIONAL BSAP ACTIONS (2008)

LIST OF ADDITIONAL BSAP ACTIONS
(Monitoring and afficiency assessment …, 2008)

5.1. Strategy A: Preservation of species in their habitats (in-situ)
A.5. Presrevation, restoration and sustainable use of key ecosystems of protected areas
A.5.11. Monitoring of protected ecosystems state in the conditions of global climate change
A.6. Preservation of rare species of animals and endangered species
A.6.7. Development of National concept of preservation of rare species of plants and animals in the conditions of global climate change
A.9. Establishment of Central-Karakum reserve
A.9.1. Development of justification and materials for establishing Central-Karakum reserve
5.2. Strategy C: Sustainable use
C. 1. Rational use of biological resources
C.1.7. Development of modern approaches to natural resources planning, monitoring. Assessment and management
C.1.8. Study and support of adaptation forms of mountain biodiversity in the conditions of observed and forecasted impacts of climate change
C.4. Economical encouragement of local population for involvement in the process biodiversity preservation
C.4.3. Preservation and sustainable management of natural resources of unique subtropical ecosystems of South-West Kopetdag
C.5. Development of sustainable ecotourism
C.5.8. Involvement of private sector in process of achieving effective financial sustainability on the example of Sumbar national park
5.3. Strategy D: Development of institutional capacity and training
D.1. Institutional support
D.1.4. Assessment of national taxonomic demands and establishing priorities
5.4. Strategy E: Environmental education and public participation
E.5. Support and promotion of nature protective actions related to culture and traditions of people
E.5.4. Inventory and systematization of traditional knowledge
5.5. Strategy F: Identification and monitoring
F. 1. Development of biodiversity monitoring system
F. 1.12. Identification and monitoring of introduction of alien species threatening biodiversity
F. 1.13. Development of integrated program on species biodiversity monitoring
F. 3. Identification of state of natural populations, species and communities and development of measures on their preservation
F. 3.8. Inventory, monitoring and protection of key ornithological territories
5.6. Strategy G: Investigation
G.4. Investigation of factors limiting progression of invasive alien species
G.4.3. Risk assessment of invasive (alien) species introduction consequences and development of combating actions

5.7. Strategy H: Exchange and access to information

H.1. Enhancement of public access to information on biodiversity

H.1.4. Development national mediatory mechanism (CHM) on biological diversity

H.2. Efficiency increase of inter-sector information exchange

H.2.3. Introduction of inter-sector and interdepartmental mechanism of interaction. Cooperation and coordination in the field of implementation of CBD demands

5.8. Strategy I: Cooperation (technical, scientific, interstate, technologies transfer)

I.2. Promotion of international cooperation and exchange of information, resources and technologies

I.2.4. Building of national capacity on biodiversity at its integration in the market system

I.2.5. Enhancement of herbarium informational system – a basis of reinforcement of the country capacity on taxonomic investigations

5.9. Strategy K: Incentive measures

K.1. Development of methods of encouragement of biodiversity preservation within the limits of sustainable agricultural production

K.1.4. Model and procedures development of economic incentives for preservation and sustainable use of biodiversity

5.10. Strategy L: Legislation

L.1. Harmonization of national legislation in accordance with international conventions on biodiversity

L.1.7. Development of accompanying documents on joining Bonn convention on preservation of migrating species of wild animals

L.1.8. Development of national system of traditional knowledge protection

L.2. Enhancement of PA legislative bases

L.2.6. Building of legal mechanism of protected areas management in accordance with international standards

5.11. Strategy N: Implementation coordination and BSAP monitoring

N.1. Establishment of coordination group on biodiversity integrated planning

N.1.6. Development of documents for consideration of new status of Strategy and action plan on biodiversity preservation (BSAP)

N.2. Development of action on integrated planning of biodiversity preservation process

N.2.4. Integration of issues of biodiversity preservation and sustainable use of bio-resources in sectors of national economy. Society and policy-forming structures

SUPPLEMENT III – INTERNATIONAL PROJECTS ON PROTECTED REGIONS

№	Project name	Donor	Year
1	Projecting of ECONET for long-term biodiversity preservation in Central Asia	UNEP/GEF/ WWF	2003-2006
2	Global value biodiversity preservation and sustainable use in Hazar reserve on the coast of the Caspian sea	GEF/UNDP	2006-2010
3	Preservation of biological and landscape diversity of Kugitang mountains in Turkmenistan, phase PDF-A	GEF/UNDP	2002-2004
4	Enhancement of protected areas management system in Turkmenistan	GEF/UNDP	2003-2006
5	Self-assessment of national capacity building demands	GEF/UNDP	2004-2006
6	Preservation of leopard in Kopetdag	WWF	1999-2002
7	Preservation of tugai deer in Turkmenistan	WWF	1999-2002
8	Enhancement of red deer populations preservation in their habitats	WWF	1999-2003
9	Support to preservation of red deer and leopard populations in their habitats	WWF	2002-2006
10	Preservation of koulan in Turkmenistan	WWF	2001-2003
11	Protection of koulan in Badhyz	WWF/LHF	2005–2006
12	Protection of “flag” species through key ecosystems preservation and restoration	WWF	2006–2009
13	Key ornithological territories of Central Asia (KOT) I phase	RSPB/BirdLife International	2005-2008
14	Key ornithological territories of Central Asia (KOT) II phase	RSPB/BirdLife International	2008-2010
15	Central Asia and Kazakhstan reserves efficiency management assessment	IUCN	2006
16	Development of institutional and staff capacity for enhanced environmental management	UNEP/GEF	2006-2009
17	National parks in Turkmenistan	Zukkov’s fund	2008
18	Support to country actions on implementation of CBD work program on protected areas	GEF/UNDP/ RSPB	2008-2010
19	Development of protected areas of Turkmenistan (phase A project)	GEF/UNDP	2009

GLOSSARY

Agro-biodiversity – agricultural biological diversity

"Turkmenmallary" Association – Turkmenistan livestock breeders Association

Adventive fraction – group of species alien (introduced) for this territory by their origin

Anthropophyte – alien species accidentally or deliberately imported by a man in the nature

"Gyok Gushak" (Green belt) JC – "Gyok Gushak" Joint-stock Company

Biological resources – genetic resources, organisms or their parts, populations or any other biotic components of ecosystems, having actual or potential benefit or value for the mankind

Biological diversity – variability of living organisms from all sources, including land, sea and other water ecosystems and environmental complexes, their being a part

Velayat – political subdivision (region)

Genetic resources, or scope of all species of land biota – hereditary genetic information contained in genetic fund of breathers

Genetic fund – genes assembly of one group of species (population or kind) within which limits they are specified by a certain frequency of occurrence

Genetic bank – storage of genetic material of plants and animals of various species, kinds, breeds, etc.

State Commission – body on provision of fulfillment of Turkmenistan obligations following from the UN conventions and programs on environment

Differentiated (regulated) nature management – system of optimal mode of land management depending on the place in natural backbone

Sanctuary – territorial form of nature protection, permitting strictly regulated forms of direct use of natural resources, not contradicting main purposes

Reserve – territory which in past and at present have not experienced impacts of any kinds of economic activities, having preserved primeval course of natural processes, natural state of biological diversity

Introduction – accidental or deliberate transfer of a species individual to the new habitat

CaspEcoControl – Caspian Environmental service of the Ministry of nature protection of Turkmenistan

Core areas – natural territories providing direct support of environmental balance, preservation of natural complexes and their components, biological diversity

"Chronicles of Nature" – scientific document reflecting annual changes of certain biodiversity elements

Habitat – type of locality of natural inhabitance of one or another organism (population)

Biological monitoring – tracking (monitoring) of biological objects (species existence,. their condition, occurrence of occasional alien species, etc.)

National park of nature (NP) – nature-conservative territorial unit combining preservation and recreation functions

Specially protected natural areas (PA) – areas, where nature management and ecosystems conditions management are regulated by special standard acts on special mode of land use

Protected or buffer zone – sites protecting key and transit territories from outside influence

Monuments of nature – objects of nature connected with any historical event or person, marked out as natural protected areas of small size with their near surrounding

Population – assembly of species of one kind inhabiting certain space

Capacity – ability of certain persons and organizations both, to take decisions and to effectively and skillfully implement them

Natural (environmental) backbone – system of environmentally mutually related natural areas capable of supporting the environmental balance in a region

Natural corridor – transit territory uniting key parts of eco-network

Natural resource – valuable source of any substance providing demand of a man

Community – group of animals and plants naturally interacting in the biotype

Preservation ex-situ – preservation biological diversity components outside of their habitats

Preservation in-situ – preservation of ecosystems and natural habitats, and also support and restoration of viable populations of species in their habitat

Sub-humid lands – insufficiently moistened dry lads with developed processes of desertification of Mediterranean communities

Tugai – forest relict ecosystems of river valleys

Sustainable use – use of biological diversity components in such a way and manner that will not lead in the long-term future to its exhaustion, thus preserving ability to meet demands of present and future generations

Whelping – birth of baby-seals

Environmental management – protected areas management

ECONET – environmental network ("econet") – system of environmentally interrelated natural territories

Ecosystem – assembly of jointly inhabiting organisms and conditions of their existence, logically connected with each other and forming a system of inter conditioned biotic and abiotic processes

Endemic – species inhabiting only this area

ACRONYMS

WIPO – World Intellectual Property Organization
EECCA - Eastern Europe, Caucasus and Central Asia
GMO — Genetically Modified Organisms
GPR — Genetic Plant Resources
GEF — Global Environment Facility
ARB — Access to Genetic Resources and Distribution of Benefits
CBD — Convention on Biodiversity
CHM - Clearing House Mechanism — the intermediary mechanism
COT — Key Ornithological Territories
CP — Conference of the Parties of the Biodiversity Convention
CEP — Caspian Environmental Program
MAB – UNESCO program "Man and Biosphere"
ISDC–Interstate Sustainable Development Commission of the International Fund of Aral Rescue
MSPCPGR — Mahtumkuli Scientific Production Center of Plant Genetic Resources
MNP — Ministry of Nature Protection
IUCN — International Union for Conservation of Nature and Natural Resources
MA — Ministry of Agriculture
IFAR – International Fund of Aral rescue
SRIF - Scientific Research Institute of Farming
NIDFF — National Institute of Deserts, Flora and Fauna at the MNP
NCAP – National Caspian Action Plan
NAPD –National Action Program to Combat Desertification
NEAP - National Environment Action Program of the President of Turkmenistan on Environment Preservation
EIA – Environment Impact Assessment
UN — the United Nations Organization
PA – Protected Areas
MCL - Maximum Concentration Limit
UN FCCC - United Nations Frame Convention on Climate Change
CASP – Central Asia Countries Special Program
SSAS – Synthetic Surface Active Substances
SAP - Strategic Action Program
BSAP — Biodiversity Strategy and Action Plan
TDA – Trans-boundary Diagnostic Analysis
FAO - United Nations Organization on Food and Agriculture
SOASTTC–Support Office Agency on CBD Scientific, Technical and Technological consultations
BirdLife International — International Union of Birds Protection
CITES - Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS — Bonn Convention on Migrating Species
IPGRI — International Plant Genetic Resources Institute
IUCN — International Union of Conservation of Nature
LHF — Large Herbivore European Fund
TACIS - European Union Program for Technical Assistance to CIS Countries and Mongolia
UNDP — United Nations Development Program
UNEP — United Nations Environment Program
WWF — World Wildlife Fund