STATE AGENCY ON ENVIRONMENT PROTECTION AND FORESTRY UNDER THE GOVERNMENT OF THE KYRGYZ REPUBLIC

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Part I. Information on the state, trends and threats in the field of biodiversity and consequences for human well-being

Importance of biodiversity for human well-being and socio-economic development

Biodiversity of Kyrgyzstan forms a favorable habitat and is one of the most important factors for human well-being. The value of biodiversity of mountainous country is far beyond it. One of the largest rivers in Central Asia, the Syr Darya River formed stock here. Water from rivers flowing from Kyrgyzstan runs to neighboring countries: China, Kazakhstan, Uzbekistan and Tajikistan. Quality and quantity of runoff significantly depends on the preservation of biodiversity, first of all the forest and grassland ecosystems in the catch basins of the rivers of Kyrgyzstan. Thus, in extremely continental and arid climate of Central Asian the state of Kyrgyzstan's biodiversity obtains regional importance.

Grassland ecosystems dominate in area and play an important role in the protection of mountainsides. Pastures are used for grazing and hay fields, indirect uses of grassland ecosystems are collecting mushrooms and berries, as well as medicinal herbs. Forest ecosystems play an important role in maintaining environmental balance, strengthening slopes, regulation of runoffs and clearing of the air. Forest communities provide important recreational and aesthetic, cognitive, educational functions, and are sources of non-forest timber products (mushrooms, berries, nuts). The use of wood for construction purposes as well as for house heating causes a significant damage to forest ecosystems. Grassland and forest ecosystems, both, are important in linking of CO_2 and oxygen supply. Aquatic ecosystems play an important role, especially as a source of fresh water, recreational facilities, as well as an area for maintaining aquatic biodiversity and producing valuable products as fishes. It is necessary to note that Kyrgyzstan is an attractive country for tourists due to its rich biodiversity. Thus, the natural ecosystems play an important role, providing invaluable services to population, which ensure his existence. More often, the value of a natural object is expressed in its price, which excessively simplifies the situation with the definition of value. Natural objects or resources cannot be evaluated, but have a value. The traditional understanding of price and value of ecosystems formed the economic significance of nature. Among the traditional economic value of ecosystem are prices of wood, berries, game, poultry and others. However, present time aspects of the "services" of ecosystems identified, but not taken into consideration although they have a high economic value. Considered and not addressed aspects of the life of ecosystems, impacting the possibility of human life, are called ecosystem services. This term is closely related to the value of ecosystems and their evaluation.

Typically, there are following basic functions of ecosystems:

- environmental functions – building and maintaining environmental conditions, which are suitable for human life;
- production function and the "ecosystem goods" – biomass, which the person withdraws from nature (food, timber, food, fuel, raw materials for pharmaceuticals and industry, and others.);
- informational and spiritually-aesthetic functions – information, which contains in natural systems, their cultural, scientific and educational value.

People can not get the large majority of these goods and services from some other sources. These entire ecosystem functions are primarily provided by natural ecosystems (stable biota), as soon as its capacity is the highest.

Unique ecosystems and fauna and floral forms

Types and classes of natural ecosystems are not interchangeable in terms of biodiversity conservation. Therefore, each class of ecosystems is unique.

Most of the existing ecosystems in the Kyrgyz Republic are unique as numerous endemic species of flora and fauna live in these ecosystems.

However, an actually unique ecosystem is *the walnut forests*, which are rich in botanical composition of the community with elements of relict forms of flora and fauna, including 49 endemic species of invertebrates and 12 species of plants. Areas of this ecosystem are located in the south-eastern slopes of the Chatkal and south-western macroslope of the Fergana ranges.

The spruce-fir forests are unique and a fir is one of the dominants of endemic spicies in Kyrgyzstan. Dominated communities of Semenov fir occupy small areas on the Chatkal range. Separate areas of firs are also found on the Talas and Suusamyr ranges.

Another unique ecosystem is the ecosystem of the Issyk-Kul Lake. It is one of the most deep-mountain lakes in the world and located in the north-eastern part of the republic at the height of 1609 meters above sea level. Salinity is 5.9-6.1 g/l. Water surface area is 6236 square km and 178 km is length, and the width is 60 km. The maximum depth is 668 m, the average depth is 280 m. The depths of over 100 m occupy more than 63% of the lake. Prior to the beginning of large-scale works on the introduction of the alien species to the Issyk-Kul Lake an intensive over-fishing, the ichtyofauna consisted of 16 species and subspecies of fishes, most of which are endemic. Currently, 26 species of fish inhabit the lake; many of endemic species are extremely reduced in number. The lake is an important object of recreation. Soft mountain-sea climate the Issyk-Kul region ensures the constantly increasing of the recreation zone of the Issyk-Kul Lake. Beautiful nature surrounding the lake favors the development of tourism.

One of the main indicators of the unique biota is the percentage of endemic species, i.e. species found only in this area. Among the groups considered as plants, such as fungi, algae, lichens, mosses, the number of endemic species in Kyrgyzstan does not exceed 3% of the total number. There are also about 2 endemic genus and 400 species of vascular plants. Among the animals endemic species are not presented in all groups, the most rich by endemic species are invertebrates, the number of endemic forms of which reaches 25% of the total number, 49 taxa of the genus rank are also endemic. Among vertebrates endemic are found only among fish - 8 species, and reptiles - 2 species.

State and trends of species diversity and ecosystems

The territory of Kyrgyzstan is unique for a high level of species diversity.

Mushrooms. Fungi. Divisions. Myxomycetes (Slime fungi), Mushrooms Mycota, Marsupials Ascomycotina. There are 8 classes, 105 families and 2,188 species.

Plants. Plantae. Algae - 416. Divisions: Bryophyta, mosses – 457, Lycopodiophyt, lycopsids – 1, Equisetophyta, class of the Horsetail – 5, Polypodiophyta – 18, Gymnospermae, gymnosperms – 15, Angiospermae, angiosperm species – 3613.

Viruses, Vira – 102.

Bacteria, Procariotae – 204 species.

Animalia, invertebrate. (Types: Animalculine Protozoa. 101 species. Spongia Porifera 3 species. Coelenterata 1 specie. Flatworms Plathelminthes 754 species. Nematogelminty Nemathelminthes. 819 species. Acanthocephala Acanthocephales. 30 species. Annelida. 30 species. Bryozoa. 1 specie. Shellfish Mollusca. 167 species.

Arthropods Apthropoda: Classes: crustaceans Crustacea, 103 species; terrestrial arachnids Arachnida, 1,050 species; Centipede Chilopoda, 15 species; millipedes Diplopoda, 10 species, Hexapoda. Class of Entognatha, 63 species. Insects, class Insecta, 9041 species.

Vertebrates Vertebrata. Classes: Pisces, 62 species. Amphibia, 4 species. Reptiles Reptilia, 34 species. Birds, Aves, 395 species. Mammals, Mammalia, 87 species.

(Inventory of Genetic Fund of Kyrgyzstan. Tt.I-IV. Chap. Ed. E.Dzh.Shukurov. Biology and Soil Institute of the National Academy of Sciences. Environmental Movemen (NGO) "Aleine", NGO "Biom". Bishkek, 1996-2011).

A significant part of the species is endangered. So, now in the Red Book of the Kyrgyz Republic 53 species of birds, 26 species of mammals, 2 species of amphibians, 8 species of reptiles, 7 species of fish, 18 species of arthropods, and 89 species of higher plants, 6 species of fungi are included (Red Book of the Kyrgyz Republic, 2007).

As a consequence of human activity some species disappeared at all, while others are endangered. The fauna of large and medium-sized mammals – 3 species died out, 15 species are under threat; in the fauna of birds – 4 species died out, 26 species are under threat; there are less losses in plants, only one type is presumably disappeared, 56 types are threatened.

State and trends in ecosystem evolution

In general, loss of biodiversity is at the ecosystem level, i.e. biodiversity biotic communities and their area, the composition ranges and areal are being reduced, decreasing the number of individual species. Most ecosystems more or less experienced a human impact. Foothill vegetation complexes, such as the piedmont plain steppe, riparian and wetland ecosystems in the Chui Valley and sub-plain community in arid, semi-arid and desert ecosystems of the foothills of the Fergana Valley are extremely changed. Aquatic ecosystems affected by pollution, regulation of water flows, fish fauna is suffering from overfishing and changed in a result of acclimatization of alien species. For the same reason there is a degeneration of aquatic and coastal communities. Foothill and mountain communities suffer from overgrazing. Forest ecosystems are in distress in a result of increasing from year to year human impact, which is expressed in the expansion of human settlements and grazing in the forest zones, and cutting of firewood. All these caused the natural regeneration of forest communities, which is especially typical for walnut forests.

Forest ecosystems

Forests are located on 5.62% (1,123,045 ha) of the country's area, despite its small area they play a significant role in the regulation of ground and surface sources, attracting additional precipitations, protecting from caving and soil erosion, prevention from the avalanches, development of the devastating mudflows and floods, as well as perform other important ecosystem functions.

In Kyrgyzstan, there are different types of forests, including juniper, fir and spruce-fir, small-leaved, walnut, maple forests and pistachio low forests.

All of these forests are essential for the conservation of biological diversity. Walnut and spruce-fir forests are unique and of global importance. Walnut forests are a source of genetic resources (wild walnuts, apples, pears, grapes, plums), which can be used to develop new varieties of fruit plants. Forests cover a relatively small area and play an important role in maintaining the environmental balance. However, there are unleagal and other types of cuttings (sanitary and others), which usually considered as a cutting for commercial timber harvesting (see Table 1), grazing of cattle barrieirs to natural regeneration of forests. A reduction in forest area are also caused by the alienation of land for construction and other purposes.

Table 1

Improvement and sanitary cuttings in the forests of the Kyrgyz Republic, ha

Types of cutting	Years						
	2006	2007	2008	2009	2010	2011	2012
Total of improvement cutting, sanitary cutting and regeneration cutting, including:	2391,2	3007,2	1630,0	7695,6	10515,0	34055,0	35269,0
Improvement cutting	140,7	942,8	55,7	41,3	36,4	25244,0	616,3
Thinning out	155,4	112,5	130,7	222,4	160,6	320,6	189,2
Reproduction cutting	8,5	23,8	120,7	2845,9	1,1	32,8	23,8
Sanitary cutting	545,6	441,1	701,2	1665,6	899,3	999,6	1898,9
Restocking cutting	36,8	74,0	66,0	72,5	82,1	47,1	41,7
Experemental cutting	No data	No data	No data	899,1	32,5	524,0	5,6
Other cuttings	1229,9	554,9	394,4	1820,9	2417,1	6674,8	3228,1
Regeneration cutting	274,3	858,1	161,3	127,9	6885,9	212,8	212,2
Data of Statistical Committee							

It is observed a growing scale of cutting when reducing areas of forests. Actually all these cuttings ignore the main objective of forests: to form a favorable environment, improve the environmental stability of the region and to conserve biodiversity. They are important for timber objectives, but contradict to the preservation of the integrity of old forests, at the same time the old ecosystems are most effectively conserve biodiversity and form a safe and clean environment. It is necessary to minimize cuttings in forests, as their main purpose is not increasing the production of wood, but the creation of conditions for conservation of biodiversity of mature forest.

Ecosystems of pastures and hayfields

Among the ecosystems of pastures and hayfields are different types of grasslands, mountains, foothills and sub low communities. The main sector of agriculture of the republic is livestock republic, development and productivity of which depends primarily on the crop and the proper use of pastures.

The main sector of agriculture of the republic is livestock farming, which level of development and productivity depends primarily on the pastures' productivity and the proper use of pastures.

The main source of feed in livestock of Kyrgyzstan is natural grasslands (pastures and hayfields), which provide from 60% up to 89% of the feed depending on the region. Natural pastures occupy an area of 8809.9 thousand ha or 86% of all lands, hayfields occupy 234.0 thousand ha or 2.6%. Natural grassland area in 7.3 times larger than the area of arable land and in 17.5 times the area of fodder crops.

About 3.5 thousand species of plants grow on pastures. According to the data of A.G. Golovkova (1959) 630 species of food plants grow in Kyrgyzstan, which form the basis of high nutrient pasture forage. Moreover, pastures are rich by medical herbs (more than 200) and honey herbs. Thus, the rich vegetation of Kyrgyzstan is a source of cheap forage source for livestock and plant resources.

As the results of the monitoring of pasture (data of Kyrgyzgiprozem, Tab. 2) demonstrate all types of pastures are under threat of different degrees of degradation, not just plain, spring and autumn, but also separate lands of mountainous and highland pastures. Area of degraded pastures in the Kyrgyz Republic (foul lands, eroded lands) is more than 3222 hectares.

Table 2.
Degradation factor of pastures

Type of pasture	**Area (ha)**	**% from the total area**	**Degradation factor (%) in 1985**	**Degradation factor (%) in 2002**
Summer	4129000	45	35	29
Spring-Autumn	2955000	32	16	26
Winter	2063000	23	12	16
Total area	9147000	100	24	25
Source: State Registry Service, Kyrgyzgiprozem				

The degradation process is not only increasing each year, but became irreversible on the significant areas. The bushing area is significantly increased. Total bushing area increased by 40% and amounted up to 1,500 thousand ha, which is on 564 thousand more than in 80-s years. Areas exposed to varying degrees of erosion increased by 59%.

On intensively used pastures, especially autumn and spring, as well as in most mountainous, previously famous for their pastures (Kara Kudzhur, Solton-Sary, Son-Kul and others) grass are significantly lost in a result of systemless grazing. Intensive grazing has led to a significant change in the species composition of grass, the amount of non-forage and weed grasses decreased.

Currently, about 3.7 million ha of pasture, i.e. its 1/3 part are heavily clogged with toxic, harmful and non-forage plants, and about 300 thousand ha are covered with thorny shrubs. The situation is worsen by the fact that most high-yielding and most well-meadow and meadow-steppe pastures provided by precipitation are clogged with the weeds up to 70-90% of the grass stand.

Geobotanical pasture research of recent years has confirmed the data of the destruction of the grass: general slowing of productivity, loss of valuable forage grasses and widespread of non-forage grasses. Loss of pasture forage of the country related to weeds exceeds 3 million tones. Especially spring and autumn pastures are subject to degradation. Pastures degradation is a danger not only in terms of reducing stocks of pasture forages. Pastures degradation causes the loss of most sensitive to grazing species, loss of unique mountain landscapes, biodiversity and the depletion of the genetical fund. Moreover, pasture erosion on hillsides contributes to the development of water erosion, which is an irreversible process in the mountains.

Productivity is one of the main indicator of the pastures state. It is a major indicator of the degradation processes in pastures.

Analysis of data on productivity of pastures found from various sources (Giprozem, КыргНИИЖ, Table 3) demonstrated that if the productivity of summer pastures in the early 70-s was 8.6 t / ha of dry weight, in 90 years it was 5.7 t / ha, according to recent data, the average productivity of summer pastures is 5.5 t / ha of dry weight. Currently, the productivity of summer pastures not exceed 5.5 t / ha, spring and autumn - 3.5-4.0 t / ha, winter - 2.3 t / ha of dry forage mass (Figure 1).

Table 3

Average productivity of pastures (centner/ha, dry weight)

Pasture type on use season	Productivity				
	70-s	80-s	90-s	Beginning of 2000-s	Present
Summer	8,6	6-7	5,7	5,5	5.5
Spring-autumn	4,9	3,5-4,0	3,9	4.2	3,5-4
Winter	3,2	2-3	1,7	2,7	2,3
Average productivity in the republic	5,5	4,7	3,7	4,1	3,7

Figure 1.
Average productivity of pastures in the republic

It can be noted, that actually the degradation processes covered all categories of pastures (Table. 4).

Insufficient food supply is observed in all areas, ranging from 6.18 to 6.96 centners of forage units per 1 livestock unit (according to zoo technical norm it requires not less than 18 centners of forage units taking into account age, productivity and physiological).

Table 4.

Factors affecting the various types of pastures

Pasture type on use season	Факторы				
	Productivity	Livestock number	Number of valuable forage grass	Number of weeds	Erosion
Summer	↓	↑	↓	↑	↑

Spring-autumn								
Winter								
Trends	Decrease				Increase			

No less dangerous trend, along with a reduction in productivity, and loss of species there are inter-ecosystem degradation, introduction of alien species or an excessive increase in number and biomass of species, which are previously not among common species (Shukurov and others, 2010).

Large areas of destruction of ecosystems become irreversible in result of the complete loss of the original, healthy matrices of natural ecosystems.

The structural degradation is expressed in the fact that subsystems providing a stable productivity in varying environmental conditions are being disappeared in ecosystems, particularly at regular frequent change of heat and moisture regimes, depending on the solar cycles, and subsystem species depleted in food webs, where they are not able to maintain the cycle of biogenious (Shukurov, 2009). There is an urgent need to identify and reliably protect preserved areas of major ecosystems from destruction matrix, otherwise there will be no way to restore biodiversity and ecosystem collapse.

Genetic resources

Genetic resources of the Kyrgyz Republic (medicinal plants, wild relatives of cultivated plants, etc.) are extremely rich and varied, but not studied fully. On the territory of the republic 1600 species of plants of wild flora grow, the largest number of useful species include such multispecies family as Poaceae (grass) – 224 species, Fabaceae (legumes) – 222, Asteraceae (bitmap) – 80, Brassicaceae (cabbage) – 73, Rosaceae (rose) – 50, Alliaceae (onion) – 49 species, etc. More than 200 species of medicinal plants used in traditional and official medicine are identified. The following plants are especially valuable: rue smelly (Thalictrum foetidum), types of aconite (Aconitum spp.), Nard leaved (Inula macrophylla), Turkestan motherwort (Leonurus turkestanicus), thermopsis Turkestan (Thermopsis turkestanica), St. John's wort (Hypericum perforatum), mother-and -macheha ordinary (Tussilago farfara), oregano (Origanum vulgare), sea buckthorn (Hippophae rhamnoides), horsetail ephedra (Ephedra equisetina), hellebore Lobel (Veratrum lobelianum) and many others.

There are also a lot of food and technical plants, including ramming tanning (Polygonum coriarium), liquorice (Glycyrrrhiza glabra), knotweed (various types) (Polygonum spp.), Species of barberry (Berberis sp.), Rhubarb Vitrokka (Rheum wittrockii) , anabasis, barnyard grass leafless (Anabasis aphylla), Ferula species (Ferula spp.), Fergana spurge (Euphorbia ferganica), types Onosma (Onosma spp.) and many others.

Wild fruit plants of the Kyrgyz Republic - relatives of cultivated plants are the most valuable material for use in breeding cultivars. The most valuable are walnut (Juglans regia), apple Sievers (Malus sieversii), Sogdian plum (Prunus sogdiana Vass.) And its subspecies, Korzhinskii pear (P. korshinskyi), Regel pear (P. regelii), Tien Shan cherry (Cerasus tianschanica), cherry magalebskaya (C. mahaleb), barberry (Berberis oblonga), types of almond (Amygdalus spp.), pistachio plain (Pistacea vera), species of hawthorn (Crataegus spp.). Most of these plants are closely related to the walnut-fruit forests of southern Kyrgyzstan.

Some micro-organisms (lactic acid bacteria and yeasts) are important in the production of traditional beverages, such as mare’s milk.

Many species of medicinal plants, such as the kinds of licorice (Glycyrrrhiza spp.), Monkshood (Aconitum spp.) are under anthropogenic pressure in result of over-harvesting.

Water ecosystems

Rivers, swamps, lakes are natural water ecosystems. The largest lakes are the Issyk-Kul, the Son-Kul, the Chatyr-Kul, and the Sary-Chelek. Marshes were mainly located in the Chui valley and now most of them are drained.

Water ecosystems play an important role in the environmental stability of the whole Central Asia, not only in Kyrgyzstan. Present time, the fish fauna of the main reservoirs of Kyrgyzstan is severely affected by overfishing. There is a reduction of stocks of most fish, including endemic. Water pollution also plays a role in reduction of biodiversity. However, the issue of the impact of pollution on biodiversity loss requires further study.

The main threats to biodiversity

Threats to biodiversity species

Threats affecting biodiversity species, divided into 2 groups: natural and anthropogenic. The natural factors include fires, landslides, mudflows, and some others that do not depend on the people. They tend to be local and do significantly threaten biodiversity.

However, in fact the frequency, intensity and localization of most so-called “disasters” largely depend on the human activities. Intentional and unintentional arsons, destruction of vegetation and soil cover slopes and floodplains, cropping landslide-prone slopes with various types of construction works – all these provoke and cause the most of such disasters. Recently, their number and incindences increased signinficantly.

Causes of loss of biodiversity at the species level

Factors affecting the biodiversity of different groups of organisms are different (Table 5). The main threat to the biodiversity of invertebrates is the human impact on their habitats (anthropogenic transformation). Deterioration of living conditions and the reduction of the area of natural ecosystems, habitats are consequences of unsustainable land use, overgrazing, frequent and /or continuous haying, allocation of land (to construction of roads, reservoirs, quarries, etc.), change the water flows, pollution by wastes and chemical contamination substances, the use of pesticides, and other events.

Table 5.

Factors affecting species diversity

Biodiversity components	Factors	Economic sector
Species level		
Insects	Degradation of ecosystems, reduction of habitats	Agriculture, Natural resources management
Large and medium mammals	Poaching	Hunting sector
Fishes	Poaching, invasive species	Fish sector
Reptiles and	Degradation of ecosystems,	Natural resources management

amphibians	reduction of habitats	
Birds	Degradation of ecosystems, reduction of habitats, poaching	Natural resources management
Mushrooms	Degradation of ecosystems, excessive collection	Natural resources management
Plants	Degradation of ecosystems, reduction of habitats, excessive collection	Natural resources management, mining sector
Ecosystems level		
Biodiversity components	**Factors**	**Economic sector**
Forest ecosystems	Poaching and other types of cutting allocation of lands, livestock grazing	Forestry, Natural resources management
Ecosystems of pastures and hayfields	Excessive load, overgrazing	Agriculture, Natural resources management
Water ecosystems	Poaching, pollution	Water resources sector

Large and medium-sized mammals mainly suffer from poaching. Monitoring the state of these animals and their protection is carried out on the territory of hunting farms, including performing currency hunting, as well as protected areas and the situation is quite secure. However, poaching is becoming more common (Table 6).

Table 6.

Identification of poaching cases and fines for the period of 2008-2012

Indicators		**Years**				
		2008	**2009**	**2010**	**2011**	**2012**
Executed a Process-Verbal	cases	298	469	501	611	552
Предъявлено штрафов	thousand KGS	75,1	105,2	91,5	111,7	102,6
Imposed fines	thousand KGS	879,5	861,9	986,3	1449,1	1219,5
Imposed fines	thousand KGS	53,1	94,6	83,2	107,2	96,1
Recovered claims	thousand KGS	450,2	840,2	813,5	1205,1	978,6

It appears, these data do not fully reflect the actual situation. Thus, 50 illegally hunted argali were seized from only one organized group.

According to the Law № 191 "On the prohibition of production, transportation, purchase, sale and export of valuable and endemic fish species in the Issyk-Kul and Son-Kul Lakes" as of August 4, 2008 a complete ban on commercial and recreational fishing in the main fishing reservoirs of the republic – the Issyk-Kul and thr Son-Kul Lakes was imposed. The fish stocks of these lakes have been reduced as a result of overfishing, and fish productivity declined several times accordingly. In 2013, the moratorium on fishing in these reservoirs has expired, but the expected replenishment of commercial fish is not being observed, due to the continuing all these years, poaching. This can be demonstrated by the following example. In 2003, the age

series of the Son-Kul peled consisted of seven age groups, and the data obtained in 2013 identified that in the lake basically there are peleds of 3 or 4 year, constituting 89% of the catch. Older age groups were not found, which clearly indicates that all peleds of older age groups completely caught by poachers. Low population of whitefish (Coregonus) in the Son-Kul is a result of fishing. Catching peled of 3 and 4 year poachers are removed from the lake in mass whitefishes of 1 and 2, which at this age reaches the same size. Taking into account this fact, whitefishes do not survive till older ages, and their stocks are small.

Poachers often used monofile fishing nets, which produced in China, the cost of which is very low, ranging from 100 to 150 soms for one net, it is comparable to the cost of 1.5-2 kg of fish. Often when stormy weather fishermen do not go fishing, and nets with rotten fish left in the reservoirs, where huge numbers of nets continue catching fish for a long time.

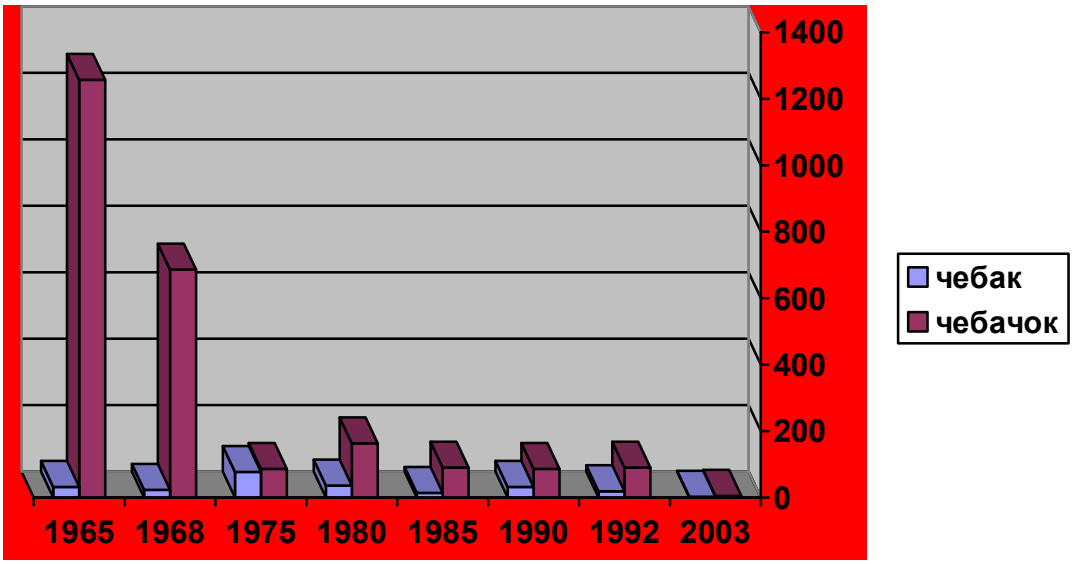
Stocking with alien species of the Son-Kul Lake is a violation of the CBD. In addition to direct damage to biodiversity of this reservoir, it has caused substantial damage to the biodiversity of the entire basin and the lake, as it resulted significant degradation of the lake ecosystem, before there were no fish. One of the negative results of stocking became interest of active poachers and the cessation of nesting goose.

Endemic and rare species of fish are affected by invasive species. Some of these species such as the Amur stunned fish, Alburnoides taeniatus, Tateurndina ocellicauda and other species have been introduced accidentally. Most of unplanned alien invaders, eating caviar, cause significant damage to valuable commercial species and endemic reservoir during the spawning period, destroying a large number of hardroe. It is possible that the number of alien invaders more replenished. Recently in the Issyk-Kul crayfish and Siberian sturgeon fingerlings were found. In the framework of the GEF/UNDP “Conservation of endemic fish fauna of the Issyk-Kul Lake” project (Alamanov A., Project Manager) during 2011-2012 efforts of artificial reproduction of Issyk-Kul naked Osman was made, but it became impossible to catch the necessary amount of the fish. This evidences that the number of fish species dramatically decreased.

Number of some endemic species of fish caught in the Issyk-Kul Lake in tonnes is demonstrated in Figure 2 (Alpiev, Imankulova, 2013).

Figure 2.

Catch of some endemic species of fish, caught in the Issyk-Kul Lake



Threats to ecosystems

Forest ecosystems

Reduction on the area of forest communities can be determined by an approximate expert evaluation, as statistics on forest area are contradictory. According to the single time accounting of the State Agency of Environment and Forestry as of 2008, the forest area is 932.1 thousand ha, which is 4.66% of the total area of the country. Whereas according to the National Forest Inventory of the Kyrgyz Republic, approved by the Government of the Kyrgyz Republic on July 26, 2011, the forest area is 1123.0452 thousand ha or 5.62% of the total area of the country. The data inconsistency is explained by different methods of calculation. With such the data scattering it is difficult to identify a real area of reduction of forests. However, it should be noted that nearly a third of the country's households, 255,816 (1,279,081 people) live in or near the walnut-fruit forests in the south. Welfare of the majority of these people directly depends on these forests. People live in the forests, collect nuts and fruits, graze cattle and harvest firewood. Because of the high cost and lack of centralized coal supplies most households use firewood due to illegal cutting of forests in floodplains and on the slopes.

Ecosystems of pastures and hayfields

The increase in the number of livestock, lack of interventions to improve the natural grassland from year to year led to an excessive load on the pastures.

Table 7

Livestock in the Kyrgyz Republic, 2006-2012 (heads)

Livestock unit	2006	2007	2008	2009	2010	2011	2012
Cattle	1052865	1094340	1145236	1224,563	1278070	1338583	1367466
Yaks	21899	22393	22790	24753	-	31165	31537
Small cattle (Sheep and goats)	3059072	3197076	3379097	4502651	4815539	5288115	5423810
Horses	345174	347526	355553	362433	372951	388971	398796

In the early 90-s of the last century according to the data of NSC in the Kyrgyz Republic livestock number was 17 million 874 thousand livestock units of sheep. Load per 1 ha of pasture was 1.94 sheep, which exceeded the environmentally sound standards of grazing on average in the country by 2.2 times.

In 1996, the number of livestock was reduced to 9 million sheep. Load per 1 ha of pastures in the whole country during this period was 1.07 sheep. It should be noted that all the livestock was concentrated around villages and village pastures were subjected to a load of 4.01 sheep / ha, which exceeded the environmentally sound standards by 4.7 times.

In 2003, the number of livestock in terms of conditional head was 10 million 887 thousand sheep. The load on the pasture was 1.18 sheep/ ha. The load on the nearby pastures was 2.74 sheep / ha, which is more than environmentally sound standards by 3.2 times.

In 2009, the number of livestock amounted 13 million 458 thousand 295 sheep. The load on the village pastures was 2.14 sheep / ha, which exceeded the environmentally sound standards by 3.3 times.

Thus, if in 90-s in a result of the reduction in the number of cattle the load on pastures decreased and they gradually recovered, the present time, the number of cattle, even according to official statistics, almost reached the level of the Soviet period. It should be noted that in previous years, when most of the livestock were owned by the government, counting the number of cattle was easier. Present time, when the cattle are distributed on farms, accurate counting of cattle is very difficult. Thus, according to the data of GEF/UNDP "Demonstration of Sustainable Pasture Management in Susamyr valley" Project, to develop grazing plans the household livestock registration was carried out. It identified that there are a difference of statistical and factual data on the number of livestock (on the example of the pilot villages). The number of cattle was more by 3 times, and goats and sheep – by 5 times. Therefore, in other villages there is a similar example. We can assume that the number of cattle in the country for a long time exceeded the level livestock units of 80-s. This is confirmed visually, when majority of areas of pasture ecosystems were observed.

The impact of the mining industry

The mining industry can be called as a special factor that can impact on biodiversity. The impact determined by the complexity of the mining process and aggravated by the need to develop appropriate infrastructure - the organization of the transport network, power lines, etc., is complex, both as on species and so on ecosystems. The development of the mining industry is accompanied by various kinds of pollution – mechanical, chemical, physical and biological. Activities of mining companies threaten biodiversity of mountain ecosystems significantly.

The impact of mining starts at the stage of mineral exploration and increases at the stage of development, when stored and increasing all influencing factors repeatedly. Thus, the area of natural landscapes, allocated for the development of direct production and the necessary infrastructure are increasing, the intensity of chemical pollution, environmental risks are also increasing, in particular, probability of technogenic catastrophes with all the negative consequences of this phenomenon is increasing dramatically.

Processes of irreversible degradation of biological resources in the areas of mining and processing of minerals contributes to the formation and accumulation of vast amounts of industrial waste, which contain highly toxic substances. Applied technology of processing of metal ores requires the use of toxic chemicals, significant energy and water consumption, construction of special facilities for the storage of toxic waste (tailings, sludge storage tanks, tailings account, septic tanks) as well as cleaning up contaminated industrial effluents.

Tailings are moved and stored in the tailing damps, which sizes reach 300-1000 hectares. During the operation period they formed the dry beaches that are intensive sources of dust emission. From 1 ha of dry tailings surface 2-5 tons of dispersive dust per day can be carried away.

Every branch of the mining industry has its own specific environmental risks, so opencast mining is accompanied mainly by the impact on terrestrial ecosystems. Oil production primarily is a potential hazard as a source of environment pollution by oil.

Uranium tailings are located in seismic and geodynamic active mountain-folded regions of the Tien Shan mountains, directly on the water catchment areas and "hang" over the densely populated valleys (Figure 2).

Unsatisfactory state of damp proofing and tightness of tailings dams caused the penetration of radionuclides into the atmosphere, ground water and to surface waters beyond tailings in the region.

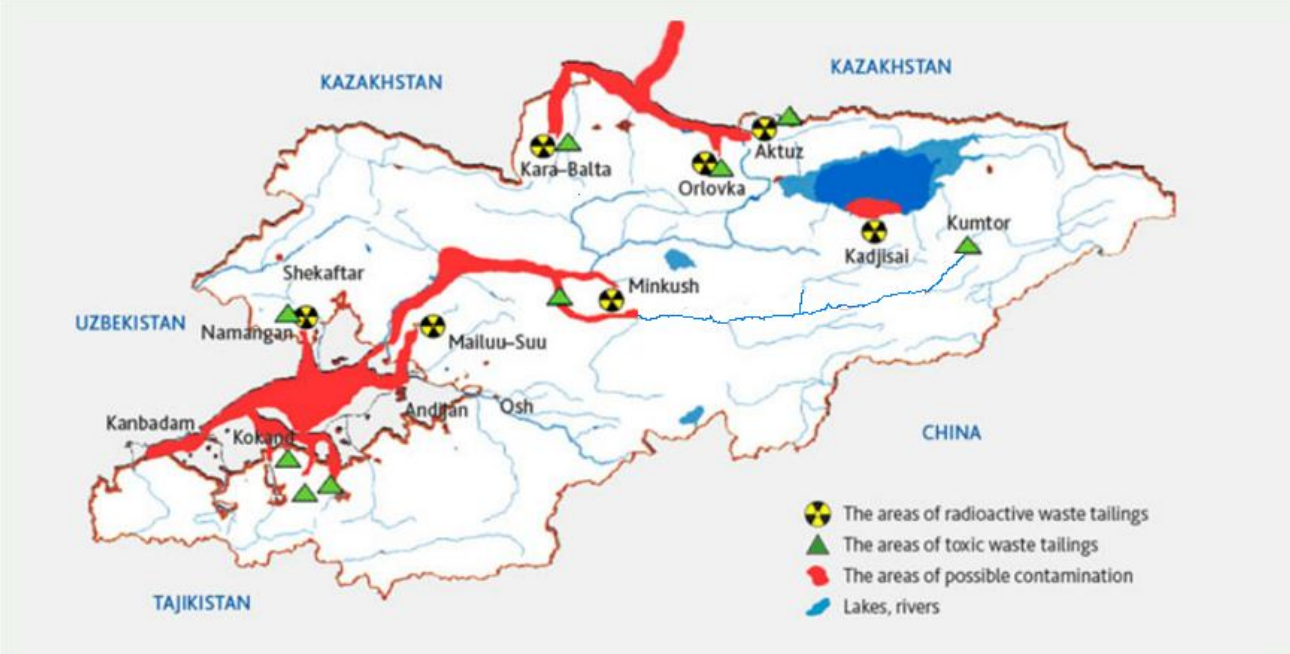


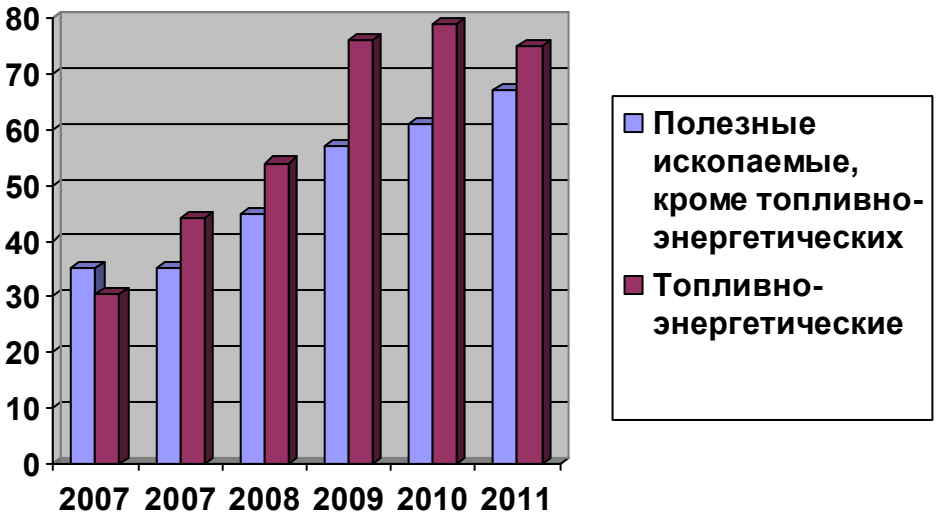
Figure 2.

Scheme of radioactive and toxic wastes tailings (highlighted with red are potential areas of prevalence of pollution).

Number of enterprises in the mining industry is growing every year (Figure 3). Doubtless, increase of their number has a negative impact on biodiversity.

Figure 3.

The number of industrial enterprises of the mining industry (2007-2011)



Socio-economic and cultural impacts of biodiversity loss

Depletion of biodiversity may impact the development of the tourism sector, and, accordingly, the living standards of local communities, whose activities related to the tourism. In its own way each species is important for the functioning of the ecosystem, so the disappearance of any species lead to a decrease the stability of the ecosystem and the ability to maintain its functions. The greatest economic and social importance is biodiversity of such important ecosystems as forests and pastures.

The main result of the depletion of pasture ecosystems is the loss of their composition of forage grasses, and vice versa, sprawl few non-forage, which form a nearly homogeneous communities. Pasture ecosystems are the source of food for both wild and domestic animals. As a result of the degradation of grassland ecosystems, loss of biodiversity of forage plants, these functions can't be supported. Most of the population is related to livestock breeding, so degradation of pasture ecosystems would deprive the population of grazing opportunities that will lead to a reduction in livestock and an increase of poverty level, as a consequence. Degradation of grasslands can cause an increase of land runoff, and as a result, the appearance of soil erosion, mudslides and landslides, phenomena of draining soil and desertification, as well as dusting an atmosphere, leading to increased melting and reduction of glaciers.

Forest ecosystems are complex set of interrelated species, and the disappearance of some of them could result the destruction of the entire ecosystem. Weakened forest ecosystems will not be able fully their functions, such as climate forcing, soil protection, regulation of surface and subsurface runoff. Moreover, some forest ecosystems are a source of non-timber forest products. The worst scenario could be deforestation in general, and their replacement by other communities. All this dramatically affect the position of the local population, who depend on the forests.

Such functions of ecosystems as fixation of carbon dioxide and release of oxygen are invaluable; therefore the reduction of these communities may contribute to the increasing global climate change.

Reduction of fish stocks will deprive the people the possibility to use this type of resource, i.e. a valuable source of protein.

Part II. National Strategy and Action Plan on Biodiversity Conservation (NSAPBC) (their implementation and mainstreaming biodiversity issue)

Short summary of the updated NSAPBC

In 1998 NSAPBC was developed by the Ministry of Environmental Protection of the Kyrgyz Republic with the participation and partnership with different stakeholders, the public and international community. The NSAPBC have not been approved by the Government of the Kyrgyz Republic. In 2002, the Strategy and Action Plan for the Conservation of Biodiversity of the Kyrgyz Republic for 2002-2006 was approved by the Decree of the Government of the Kyrgyz Republic. The validity of the NSAPBC has expired, but the country has not updated the existing NSAPBC till convening of the 10th meeting of the Conference of the Parties, as it is required by Article 6 of the Convention. Therefore, today it is possible to evaluate the implementation of the NSAPBC for 2002-2006. The strategy includes 9 targets:

1. Conservation and restoration of the most important complexes of flora and fauna, ecosystems and landscapes to a state of sustainable natural reproduction
2. Conservation and sustainable use of forest resources, and the annual increase of forest area
3. Expansion of specially protected natural areas

4. Reduction of environment pollution

5. Improvement of the environmental legislation to ensure effective protection of biological and landscape diversity
6. Increase of public awareness, environmental education and community involvement in environmental decision-making
7. Establishment of economic mechanisms to promote the conservation and sustainable use of biological and landscape diversity
8. Attraction of domestic and foreign investment to promote the conservation and sustainable use of biological diversity
9. Contribution to the poverty reduction rate in the Kyrgyz Republic.

Despite the fact that NSAPBC was developed without taking into account the Strategic Plan for the conservation and sustainable use of biodiversity for the period 2011-2020, their goals and objectives correspond to some of the strategic objectives of the Aichi plan and targets (Table 8).

Table 8

Compliance of the NSAPBC of the KR on biodiversity conservation targets of the Strategic Plan for Biodiversity and the Aichi targets

№	Strategic targets	Aichi
1	Conservation and restoration of the most important complexes of flora and fauna, ecosystems and landscapes to a state of sustainable natural reproduction	Target 12: By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
2	Conservation and sustainable use of forest resources, and the annual increase of forest area	Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
3	Expansion of specially protected natural areas	Target 12
4	Reduction of environment pollution level	Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
5	Improvement of the environmental legislation to ensure effective protection of biological and landscape diversity	Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
6	Increase of public awareness, environmental education and community involvement in environmental decision-making	Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

7	Establishment of economic mechanisms to promote the conservation and sustainable use of biological and landscape diversity	Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
8	Attraction of domestic and foreign investment to promote the conservation and sustainable use of biological diversity	Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.
9	Contribution to the poverty reduction rate in the Kyrgyz Republic	Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

The Action Plan of a KR includes 36 actions classified in 12 sections, including: Conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural habitat (in-situ); Conservation of components of biological diversity outside of their natural habitats (ex-situ); Sustainable use of biological and landscape diversity; Organizational capacity development and training; Sustainable use of biological and landscape diversity; Identification and monitoring; Researches; Information exchange and access to information; Impact assessment; Legislation; Financial resources. A significant part of the objectives of the National Action Plan correspond to the targets and objectives of the Strategic Plan of Biodiversity Conservation and the Aichi targets (Table. 9).

Table 9

Compliance of the Action Plan of the KR on biodiversity conservation to the targets of the Strategic Plan for Biodiversity conservation and the Aichi targets

	Actions	Aichi targets
	Conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural habitat (in-situ)	

1	Expanding the network of the specially protected areas (SPNAs), creation of national parks "Dashman" and "Padysha-Ata" in Jalal-Abad oblast, "Alamedin" in Chui oblast, "Chon-Ak-Suu" in Issyk-Kul oblast	Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.
2	Development and implementation of action plans on the protection of endangered plant and animal species	Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
	Conservation of components of biological diversity outside of their natural habitats (ex-situ)	
3	Creation a nursery for rare and endangered plants in order to their study. Improving nurseries.	Target 12
4	Establishment of a center for the rehabilitation of captive breeding of animals, endangered species, for their reproduction	Target 12
	Sustainable use of biological and landscape diversity	
5	Development policy in all sectors, which ensures the conservation and sustainable use of biodiversity of the Kyrgyz Republic	Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
6	Coordination of the rational use of biological resources by the local population	Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at

		all relevant levels.
7	Identification of key areas for the development of eco-tourism, taking into account the vulnerability of areas. Development and implementation of measures for ecotourism. Creating equipped ecological routes and sites	Target 18
	Organizational capacity development and training	
8	Preparation and regular organization of cross-sectoral workshops and trainings for the exchange of experience and information on biodiversity	Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably
9	Support of researches on biodiversity conservation in the country, particularly on protected areas	Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
10	Preparation and organization of regular workshops and training for the public on development of ecotourism	Target 1
	Environmental education and public participation	
11	Awareness raising via the mass media (newspapers, radio and TV), environmental scientific and popular publications. The creation and distribution of special video clips and promotional and informational materials (postcards, brochures, etc.) on biodiversity conservation	Target 1
12	Carrying out of actions, public events in order to raise public awareness on the biodiversity conservation issues	Target 1
13	Raising of public awareness on national traditions, culture and interrelation with nature	Target 1,18
	Identification and monitoring	
14	Update and publication of the National Red Book	Target 12
15	Update and publication biodiversity maps and its conservation priorities based on new data obtained in a result of researches and monitoring	Target 19
16	Establishment a data bank on the biodiversity of the Kyrgyz Republic, including an analysis of the available data and update information obtained in a result of monitoring and researches	Target 19
	Researches	
17	Study of abiotic, biotic and anthropogenic factors affecting the biodiversity of the republic and the	Target 19

	development of recommendations for their optimization	
18	Conducting research on biotechnologies and their possible applications in environmental protection and biodiversity conservation. Determination of the potential risks associated with the use of technology and the development of recommendations on biosafety	Target 19
	Information exchange and access to information	
19	Creation of public information centers with access to information on biodiversity in the country and the world	Target 19
20	Organization of Central Asian regional workshops information exchange on biological diversity in the region	Target 19
21	Cooperation (technical, scientific, interstate, technology exchange)	Target 19
22	Promote international cooperation and exchange of information, resources and technologies	Target 19
23	Development and expansion of bilateral interstate exchange programs for scientists and managers on the biodiversity conservation issues	Target 19
24	Improvement of the system of restrictions on imports or exports of species threatened in accordance with international agreements	Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
25	Publication and distribution of regional Green Book, which lists the ecosystems threatened in Central Asia	Target 19
	Impact assessment	
26	Improvement of methodologies to assess impacts and requirements to be taken into account the impact on biodiversity, their use in assessing the impact of geological exploration, agriculture, mining (including tailings), transport, power lines and other sources of pollution or emissions	Target 4
27	Monitoring of economic activities, which have the most negative impact on biodiversity	Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant

		international obligations, taking into account national socio economic conditions.
	Stimulating measures	
28	Development of small grants programmes to attract people and local authorities to solve biodiversity conservation issues in the regions of the republic	Target 20
29	Stimulating the development of ecotourism with maximum involvement of local labor resources and minimal impact on the local culture and biodiversity	Target 18
	Legislation	
30	Development of draft regulations for the conservation of biodiversity, changes and amendments to the relevant legislation of the Kyrgyz Republic	Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
31	Development of normative legal acts on the introduction of restrictions on biological technologies, products and resources that are potentially dangerous for biodiversity and human health	Target 3
32	Development of normative legal acts on cooperation among governments on the management of transboundary protected areas	Target 3
33	Development of regulations on environmental audit	Target 3
	Financial resources	
34	Development of system of small grants, interest-free loans and micro-credit projects on biodiversity conservation	Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to

		resource needs assessments to be developed and reported by Parties.
35	Conducting trainings on project development and grant applications suitable for international donors	Target 20
36	Consideration of new funding mechanisms for the conservation of biodiversity	Target 20

Thus, the objectives of NSAPBC correspond to the objectives of the Strategic Plan for Biodiversity Conservation for 2011-2020, and not less than 11 Aichi targets. In implementing these targets and objectives, they could contribute to the elimination of most of the threats to biodiversity.

Implementation of NSAPBC (adoption of appropriate legislation and policies, established institutions and mechanisms, funding and other types of investments for implementation, implemented programmes and projects, etc.)

Activities on fulfillment of the Convention, presented in this report, indicates that joining to the Convention on Biological Diversity has a positive effect on the biodiversity of the country. In the Country Development Strategy for 2009-2011, environmental security issues have been included as one of the five priorities of the country (section 6.4.1. Ensuring environmental security). At the same time, efficiency measures for the conservation of biodiversity were determined as one of the objectives. To achieve these objectives, measures aimed at improvement of the environmental legislation to meet the commitments under this and other related environmental conventions should be implemented. National Sustainable Development Strategy of the Kyrgyz Republic for the period of 2013-2017 was developed and approved by the Decree of the President as of 21 January 2013; it focuses on environmental protection for sustainable development (Chapter 5). Programme on Transition of the Kyrgyz Republic to Sustainable Development for the period 2013-2017 was developed and approved by the Decree of the Government № 218 as of April 30, 2013, the Programme takes into account issues in the field of environmental protection and rational use of natural resources. One of the four priorities of this Programme is to conserve biodiversity and to restore natural ecosystems in conditions of a changing climate. In this framework two objectives were identified: 1. to provide conditions for the preservation of natural ecosystems by expanding protected areas up to 7% of the country and to strengthen their capacities; and 2. to ensure the conservation of forests until 2017 at a level not less than 5.62% of the country's territory. Achievement of the set objectives planned through implementation of a number of activities jointly with the National Academy of Sciences, State Registry, LSG, non-governmental and international organizations. Many of the activities will be implemented in the framework of international projects supported by the GEF, UNDP, WWF, FAO, UNEP, KOICA and others.

In order to develop measures to conserve the unique ecosystem of the Issyk-Kul Lake, the Concept of Sustainable Development of Environmental-economic system “Issyk-Kul”, approved by Decree of the President of the Kyrgyz Republic as of February 10, 2009 № 98 is being implemented. The concept considers the development of the Issyk-Kul region as a whole ecosystem, which will ensure the high quality of the environment, economic growth and welfare. Biodiversity conservation issues are the basis for sustainable development of the Issyk-Kul region. Unfortunately, the adoption in 1999 of the Law “On the biosphere reserves of the Kyrgyz Republic” and declaration of the Issyk-Kul region as Biosphere Territory have not led to the establishment of the regime of the biosphere reserve, which could help to conserve biodiversity.

Vice versa, time was lost, while even the works on the biosphere zoning on the ground at least in the Issyk-Kul basin.

Basics of the state policy in the field of forest ecosystems identified in the Concept of Forestry Sector Development for the period till 2025 (the Decree of the Government of the KR as of 14.04.04, №256) and the National Forest Programme for the period till 2015.

Pointing the new challenges and problems associated with global climate change, Priority Directions for adaptation to climate change till 2017 in the Kyrgyz Republic was developed, it considers adaptation measures on key sectors: water resources, agriculture, public health, climate emergencies, forest resources and biodiversity.

In order to conserve and restore the population of the snow leopard National Strategy for snow leopard conservation in the Kyrgyz Republic for 2013-2023 was developed and approved by the Decree of the Government of the Kyrgyz Republic as October 19, 2012, № 732. Plan for the implementation of the Strategy was developed and approved by the Decree of the Prime Minister on August 5, 2013. Unfortunately, the issue on the hunting for the main forage species of leopard - ibex and argali was not solved. Argali is included into the Red Book of the Kyrgyz Republic since 2005, but the game hunting is still continuing. Actual reduction in the number of argali and ibex negatively impacts on the leopard, which already had lost the opportunity of normal reproduction in most areas of Kyrgyzstan.

Programme of study the state of populations of mountain sheep and ibex and their conservation on the territory of the Kyrgyz Republic for 2010-2014 wa developed and approved by the Decree of the Governmental as of October 11, 2010, № 238.

A draft of Priorities for the Conservation of wetlands of the Kyrgyz Republic till 2023 and Action Plan for their implementation for 2013-2017 was developed as well.

In 2008, the Decree of the President of the Kyrgyz Republic on measures to preserve and increase fish stocks in the Issyk-Kul, Son-Kul lakes and other reservoirs was issued. National Forest Programme for 2005-2015 was adopted, approved by the Government of the Kyrgyz Republic on November 25, 2004, № 858. By the Resolution of the Government of the Kyrgyz Republic as of September 23, 2011, № 599 A set of measures to ensure environmental security in the Kyrgyz Republic for 2011-2015 was approved.

A number of the following international projects aimed at addressing biodiversity issues have been and are being implemented: the GEF-UNDP “Strengthening policy and regulatory legal framework for addressing biodiversity in the fishing industry” Project UNDP-GEF “Demonstrating Sustainable pastures management in Susamyr valley, Kyrgyzstan” Project, UNDP “Restoration of riparian forests in the floodplain of the Chu and Kok-Moinok rivers of Kyrgyzstan” Project, KOICA “Strengthening the potential of forests conservation of Kyrgyzstan” Project (complex project) and others.

Within the framework of the GEF-5 the following projects were launched: FAO/GEF project “Sustainable management of mountain forests and land resources of the Kyrgyz Republic under climate change conditions” and the UNDP/GEF “Improving coverage and effective management of protected areas in the Central Tien Shan” Project. The European Union “Management of forests and biodiversity, including environmental monitoring” Regional Project was launched as well (FLERMONECA).

Thus, for the period from the preparation of the Forth National Report on Biodiversity of the Kyrgyz Republic (2006) the following results were achieved:

National legislation is gradually improving. Adopted the following legislation:

1. Law “On Payment Rates for the Use of fauna and flora in the Kyrgyz Republic” dated August 11, 2008, № 200.

2. Law “General technical regulation on environmental security in the Kyrgyz Republic” dated May 8, 2009, № 151.

3. The Law "On the Prohibition of production, transportation, purchase, sale and export of valuable and endemic fish species in the Issyk-Kul and Son-Kul Lakes" dated August 4, 2008, № 191.

4. The Decree f the Government of the Kyrgyz Republic "On approval of the rates for calculation of compensation for damage of objects of flora and fauna by legal and physical persons" as of May 3, 2013, № 224, which determines the payment rate for the illegal destruction of rare and endemic species.

However, most of these policies and programmes have just started their activities and implementation of the planned targets and objectives is a matter for the future.

The progress achieved in terms of positive changes in biodiversity

The following results were achieved:

1. The area of specially protected natural areas expanded from 5.2% in 2008 to 6.006% in 2012. The national system of specially protected natural areas in the Kyrgyz Republic includes by 11 state reserves (604.3 hectares), 9 state natural parks (302.9 hectares), 10 forests, 23 botanical, 19 geological, 2 and 14 complex hunting (zoological) reserves with a total area of 301.4 thousand ha. Today according data of SAEPF the total area of all categories of specially protected natural areas to date is 1,200,872.0 hectares or 6.006% of the country's area. Since submission of the 4th report two state reserves were organized: Surmatash State Reserve (2009) and Dashman State Reserve (2012), as well as the State Natural National Park "Sarkent" (2009).

2. Annually the country's forestries plant the forests on the area up to 3000 hectares.

3. The first national forest inventory of of the Kyrgyz Republic for 2008-2010 was made and a database was created. The results of the inventory was approved by the Decree of the Government as of July 26, 2011 № 407 and a brochure "Integrated Assessment of Natural Resources for 2008-2010" was published. It contains statistical data analysis and evaluation of tree and shrub resources of Kyrgyzstan.

4. Since 2005, sustainable development principles are being integrated into the education system of the Kyrgyz Republic in the framework of the Concept of transition of the Kyrgyz Republic to Sustainable Development until 2010.

5. The legal framework for the protection of biodiversity is enhanced.

Bottlenecks in implementation

Mostly bottlenecks in the implementation of the Convention are the same as those observed in the Forth National Report of the Kyrgyz Republic. All these obstacles are well known:

- There is a noncompliance and violation of laws on the protection and use of biological resources;
- There are many conflicting laws, as well as large gaps in the legislation;
- Issues of biodiversity conservation and specially protected natural areas in the country are associated with low-budget financing, which defines low material-technical, scientific and human capacity of protected areas and effectiveness of biodiversity conservation. Most of national policies and programmes depends on external factors;
- The state budget almost does not consider funds for the state cadastre of flora and fauna and monitoring of biodiversity;
- There is no system of monitoring, recording, evaluation, prognosis, control and management of biological resources;

- There are no governmental programmes and plans for the conservation and sustainable use of wild plant resources;
- Poaching, illegal logging, the destruction of pasture ecosystems are being increased;
- The current system of staff development does not meet the training needs of the environmental area;
- There is weak intersectoral and interagency cooperation in the field of biodiversity conservation;
- There is a lack of public awareness about the importance and value of biodiversity
- Most of the concepts and strategies are framework and do not have a mechanism for implementation.

As a result, many of the taken measures are not effective. Thus, in a result of poaching fishing measures taken to prohibit the production, transportation, purchase, sale and export of valuable and endemic species of fish in the Issyk-Kul and Son-Kul lakes were unsuccessful. This fundamentally damages efforts to restore and to use natural resources rationally, which in the future will undoubtedly cause a decrease of living standards. The same can be said about the poaching hunting. Such an increase of poaching became possible due to a lack of funding for security and inspection services. The lack of monitoring of the state of pastures, as well as plant and animal resources does not allow planning their sustainable use. All this can lead to their complete degradation, and as a result will lead to worsening the standard of living of local communities, whose activities related to pastures.

The contribution of national measures to the implementation of the thematic programmes and cross-cutting issues under the Convention (review)

Cross-cutting issues

Access to genetic resources and benefit-sharing

Summit on Sustainable Development (Johannesburg, September 2002) called for negotiations on the Convention of the international regime to promote and safeguard the fair and equitable sharing of benefits arising from the utilization of genetic resources. The Conference of the Parties of the Convention responded to the call at its seventh meeting in 2004, entrusting its Ad Hoc Working Group on Access to Genetic Resources and Benefit-sharing to elaborate and negotiate on international regime on access to genetic resources and benefit-sharing to ensure the effective implementation of the Article 15 (Access to genetic resources) and Article 8j) (Traditional knowledge) of the Convention and its three objectives. As a result, on 29 October 2010 at the 10th meeting of the Conference of the Parties in Nagoya (Japan) signed the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their utilization. The most important innovation of the Protocol is specific obligations to support compliance of domestic legislation or regulatory requirements of the Party, providing genetic resources and contractual obligations stipulated in mutually agreed terms. These provisions on compliance with necessary requirements and provisions creating more predictable conditions for access to genetic resources will contribute to guarantee of joint benefit-sharing in cases, where genetic resources are exported from the territory of the supplying Party. Moreover, the provisions of the Protocol on access to traditional knowledge of indigenous and local communities related to genetic resources enhance the ability of these communities to benefit from their knowledge, innovations and practices. In accordance with paragraphs 3 and 7 of the Article 15 of the Convention, the benefits of the utilization of genetic resources, as well as subsequent applications and commercialization are shared in a fair and equitable way with the

Party providing such resources that is the country of origin of such resources or a Party that has acquired genetic resources in accordance with the provisions of the Convention. Such benefits-sharing is implemented on mutually agreed terms.

At present, the Kyrgyz Republic has significant genetic resources and low level of development of biotechnologies. This allows the country to act on the international scene only as a source of genetic resources. However, this also requires the development of an appropriate legal framework. Therefore, the country is working on the creation of legislation on access to genetic resources.

Currently, access to genetic resources is gained with the permission of SAEPF, which is in fact the national focal point on access to genetic resources. The organization considers and gives permission for collection and disposal of certain genetic resources, which are usually considered certain types of drugs, food and some other types of vegetable raw materials. Some animal products or materials for scientific research are imported rarely. The National Academy of Sciences provides consultations during the decision making process. Actually local communities are engaged in the permitting process. The Government takes specific legislative measures to protect the rights of local communities on genetic resources that are under supervision of indigenous and local communities. The Law "On Protection of traditional knowledge" was adopted on July 31, 2007 by the Decree No. 116. According to the Law the objectives of state regulation in the field of traditional knowledge are a legal protection, preservation and promotion of the wide application of traditional knowledge in various fields of human activities, promoting the use of traditional knowledge, including those based on genetic resources in industrial production, as well as the further commercialization of objects produced as a result of their use.

Collection and disposal of certain genetic resources cost a certain fee. Collection and disposal of certain materials for non-commercial use, including for research, carried out for a minimal fee. Nagoya Protocol on Access to Genetic Resources and Benefit-sharing has not been adopted yet, but the work on its adoption is being conducted.

However, the practice of the use of genetic resources, especially gathering of some objects, demanding in China and undermining the conditions of their renewal requires a reduction to the regulations preventing their decline.

Biodiversity for development

Biodiversity is an important component of human development, thanks to the provision of biological resources and ecosystem services. Degradation of habitat and loss of biodiversity threaten the normal existence of a large number of people. Therefore, the strategies for the protection of biodiversity should be developed to contribute to reduction of poverty and achievement of sustainable development. The Convention (Article 6 (b)), calls on Parties to "integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies". This concept is often called "the problematics of biodiversity" and it should be implemented in the framework of the National Strategy and Action Plans on Biodiversity Conservation (NSAPBC). It is particularly important for biodiversity in developing countries as Kyrgyzstan.

At the 11th meeting of the Conference of the Parties decisions to integrate biodiversity considerations into national processes, to take into account the links between biodiversity loss and poverty, to protect and encourage traditional use of biological resources were taken. The issue of biodiversity for poverty eradication and development should be considered as a cross-cutting theme in all relevant programmes of measures under the Convention, and integrated into national strategies and action plans for the conservation of biodiversity, as well as should be

related to the implementation of the strategic goals of the Plan for Biodiversity for 2011-2020 and targets biodiversity.

Kyrgyzstan undertook certain measures to integrate biodiversity conservation issues into national policies and programmes aimed at reducing poverty, achieving the Millennium Development Goals and sustainable development, and others. (See paragraph B7).

Climate change and biodiversity

Emissions from fuel combustion, agriculture and other emissions contribute to the increase of greenhouse gas concentrations. This causes an increase in temperature of the earth surface and lower atmosphere and is accompanied by many other changes. Increased levels of greenhouse gases in the atmosphere have caused climate change. According to the Fourth Assessment Report of the Working Group I (WGI) of the Intergovernmental Panel on Climate Change (IPCC) from 1850 to 2005, the average temperature of the planet has increased approximately by 0,76ºC, and the average sea level has risen by 22 centimeters over the past century. According to the Fourth Assessment Report of the IPCC WGI in 2100, it is expected to increase in temperature by 1,4-5,8 ° C. Predictable consequences of this include: further sea level rise, changes in precipitation and other changes. Biodiversity was able to adapt to changes occur earlier due to the evolution and the formulation of natural adaptation strategies. However, earlier climatic changes occurred over a long period of time, and then there was no human impact on the environment. The expected impact of warming on ecosystems and their biodiversity is much greater in comparison with that took place in a result of global climate change in the past. According to the "Millennium Ecosystems Assessment" report, climate change will cause the biodiversity loss to end of the century. Conservation of natural ecosystems and restoration of degraded ecosystems is essential in order to achieve common goals of the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change, as ecosystems play an important role in the carbon cycle and climate change adaptation, while providing a wide range of ecosystem services, it is necessary for the welfare of the people.

Biodiversity can also contribute to reduce the adverse effects of climate change. Protected or restored habitats contribute to the capture of carbon dioxide from the atmosphere and thus contribute to addressing climate change by storing carbon.

In order to increase the adaptive capacity of species and ecosystem resilience it is necessary to take the following measures, such as:

1. Reduction of non-climatic loads, such as pollution, over-exploitation, loss and fragmentation of habitats and the impact of alien species;

2. Broader implementation of methods of nature protection and sustainable use, including by strengthening networks of protected areas, conservation system matrices of undisturbed ecosystems;

3. Facilitating adaptive management through strengthening monitoring and evaluation systems.

Use of biodiversity and ecosystem services under ecosystem-based adaptation is summarized in the framework of a common adaptation strategy. It includes the sustainable management, conservation and restoration of ecosystems to provide services that help people to adapt to the adverse effects of climate change.

The following examples include adaptation measures on ecosystem base:

1. Protection of coasts through the maintenance and /or restoration of coastal wetlands to reduce the risk of coastal flooding, pollution and coastal erosion;

2. Sustainable management of wetlands of mountain areas and flood plains to maintain watercourses and water quality;

3. Conservation and restoration of forests to stabilize slopes, precipitations and regulation of watercourses;

4. Introduction of various agroforestry systems to regulate the increasing risks, which are caused by changes in climatic conditions;

5. Conservation of agro-biodiversity through creating a specialized gene pools in order to adapt crops and livestock to climate change.

To carry out the programme to mitigate the impact of climate change on biodiversity certain measures are taken:

State forestries conducted planting forests on an area of about 3,000 hectares, planted trees with support of various projects. Under the support of FFI seminar to assess the impact of climate change on some species of woody plants was conducted. The network of specially protected natural areas is being expanded; it helps to reduce the fragmentation of habitat types and improves the safety of ecosystems. An evaluation of environmental services for some (limited) areas and types of ecosystems is made.

The impact during activities that may affect climate change is being assessed. Phytoquarantine Inspection exercises control over penetration into the country of adventive species, as well as the distribution on the territory of the Republic of some certain species of plants and animals. Protection of some ecosystems is implemented, for example, cutting of valuable trees is prohibited.

Genetics bank for conservation of agro-biodiversity is established. However the programme for the restoration of degraded ecosystems does not exist. Monitoring of assessment of the impact of climate change on biodiversity is not carried out.

Invasive and alien species

Alien species that become invasive is one of the main causes of biodiversity loss at global level. They damage significantly, which is estimated at hundreds of billions of dollars annually. In accordance with Article 8 h the Party of the Convention prevents the introduction of alien species that threaten ecosystems, habitats or species, controls or eradicates these alien species. Kyrgyzstan considers the problem with adventitious plant species insufficiently. Ecosystems of Kyrgyzstan are not damaged so that adventive species can compete with native plants. Basically adventitious plants are naturalized near cities and as a weed in the lands of agricultural purpose. However, if the degradation of ecosystems will continue in such scales, these species can be a serious threat to biodiversity. Adventitious species influence more significantly on fauna reservoirs. As a result of the introduction of alien species population of endemic fish species are significantly affected.

Currently the country takes certain measures to prevent the transfer of new invasive species into the country. This duty is performed by Phytoquarantine Inspection, which oversees the transfer into the country and the proliferation of adventitious species in the country of some certain species of plants and animals. A number of scientific articles, including data on the distribution within the republic of new adventive plants are published.

Unfortunately, there are certain difficulties in the identification of species, transferring into the country. MAWRPI combat to invasive species, but there is a lack of specialists in the taxonomy.

Collections, which are available in the country, do not contain comparative material on species from adjacent territories. Practically, education and training of specialists in the field of taxonomy are not conducted, both within the country and abroad, although the need for specialists in the taxonomy of different taxonomic groups is large enough. There is no strategy to combat to alien species. There is no information about the dangers of adventive species biodiversity. The risks associated with the introduction of alien species are not considered. There is no monitoring of the distribution of the majority of adventive species in the republic, except for a few, the most dangerous ones. The ways of transfers of adventive species into the country are studied insufficiently. There are no records of adventitious species transferring into the territory of the

republic. There is also a weak cross-sectoral integration of activities to combat adventitious species. Often reorganization of structures responsible for the combating adventitious species caused their degradation.

Global Taxonomy Initiative

Article 7 of the Convention on Biological Diversity (CBD) includes the obligation of the countries, which signed the Convention, i.e. Parties, (Countries, which have ratified or acceded to the CBD), in the field of identification and monitoring. Any decision relating to biodiversity and implementation of practical measures, its use or preservation, require information, which is based on comparable credentials. A number of additional recommendations and amendments to Article 7 of the CBD are contained in separate COP (COP decisions). Complex decisions are reflected in the fundamental document, called the Global Taxonomy Initiative (GTI), actually, is another global convention.

Certain activities on the identification of the components of biodiversity and their monitoring at the level of species and ecosystems are carried out. In comparative completeness of the implemented taxonomic inventory of biota of the whole country, cadaster of the population of the majority of species is not developed. All or a large number of population in the country are inventoried (identified, recorded) only of higher plants and vertebrates. To date, the species composition of all taxonomic groups represented in the fauna and flora of the country are identified. Information compiled and published as a series of reports, but a number of lists needs updating.

Programmes of inventory and monitoring in protected areas under the SAEPF are implemented, but they do not include all taxon and ecosystems. The diversity of ecosystems in the country identified, classified and mapped sufficiently. Monitoring is carried out at the ecosystem level in a number of ecosystems of particular interest and importance to the conservation and sustainable use of biodiversity, especially for forest communities. The National Forest Inventory was held recently. Monitoring, designed and implemented by the responsible agencies, includes three different areas: the registration status and number of populations of the main species of plants and animals after a certain period of time.

Unified national system (concepts, techniques, institutional framework) to identify components of the biodiversity and monitoring of the spectrum of facilities is developed. Identification of species composition and incidental observations of particular interest ecosystems are largely carried out in the framework of individual НИР plans of НИУ specialists based on their own resources and capabilities.

Special public funding of collections is either absent or inadequate and there is a risk of their loss. Infrastructure (facilities, staff, budget) in the country is at an insufficient level and in a more or less satisfactory condition only thanks to the initiative and enthusiasm of the curators. In the Kyrgyz Republic there is no one special programme on the capacity building policies of specialists and qualified technical personnel in the field of taxonomy. The majority of taxonomists working in Kyrgyzstan held an internship or graduated the central НИУ of the former USSR (Komarov Botanical Institute of the Russian Academy of Sciences, Zoological Institute, Russian Academy of Sciences, Zoological Museum of Moscow State University named after M.V. Lomonosov, ИПЭЭ etc.), But their number each year has been steadily declining.

Training taxonomists of proper qualification level in the volume of educational programs of biological faculties or departments (especially Institutes of zoological / botanical profile or in other universities) in the KR is impossible. Legal existence of Biology and Soil Institute and ИЛиО in the structure of the National Academy of Sciences and other relevant departmental of НИУ ensures the existence of vacancies for specialists on biodiversity and taxonomy. However, the situation with the activities of groups and individual experts on

biodiversity and taxonomy in academic and research institutions of many other institutional structures is very unstable as their funding, administrative and structural stability.

National Assessment of taxonomic capacity for implementation of the CBD was held insufficiently. There is a lack of public investment in long-term projects, development of infrastructure of taxonomic collections, as well as in research and monitoring of biodiversity at ecosystem and species levels.

SAEPF coordinates (http://www.kyrgyzforest.kg) Programme of inventory of species diversity of its SPNAs, which is most successfully carried out on vertebrate animals, terrestrial higher plants, objects of the Red Book, major ecosystems and some groups of species, such as medicinal plants and forest pests.

The National Forest Inventory was held recently.

Administration of Hunting Inspection regularly records the number of hunting and commercial animals. Local monitoring of certain objects (endangered species listed in the Red Book of mammals and reptiles, and others.) is also carried out in the framework of several projects and does not covers all species of the Red Book.

Quality of conducted monitoring is different and depends on the nature of the agency, which is responsible for monitoring. Factually, there is no monitoring of biodiversity at ecosystem and genetic levels.

Incentive measures

Article 11 of the Convention states:"Each Contracting Party shall take, as far as possible and as appropriate, economically and socially sound measures that promote the conservation and sustainable use of components of biological diversity", and also the importance of incentive measures in achieving conservation and sustainable use of biological diversity was recognized. In 2000, at the 5th COP decision V/ 5, a programme of work on incentive measures was adopted, which sets a number of targets, as well as activities and requires the Parties to achieve the goal.

The program considered:

a. case studies for the evaluation of existing incentive measures, identification of new opportunities for incentive measures, and dissemination of information;

b. development of methods to promote information on biodiversity in consumer decisions, for example, through eco-labeling;

c. records in accordance with the terms of the parties how best to extend these values in public policy initiatives and private sector solutions

d. inclusion of biodiversity values in liability regimes;

e. creation of incentives for integration of biodiversity concerns in all sectors.

In 2008, the Conference of the Parties revised the Programme.

Noting the importance of incentive measures for achieving the objectives of the Convention, the Conference of the Parties recognized the continuing relevance of the programme of work and emphasized that:

a. Incentive measures should contribute to the conservation of biological diversity and the sustainable use of its components and should not negatively affect biodiversity of other countries;

b. Contribute to sustainable development and poverty eradication;

c. Take into account national and local conditions and circumstances.

e. Be in harmony with the Convention and other relevant international obligations. COP decided to pay more attention to: a. Assessing the value of biodiversity and associated ecosystem services, as one important basis for public awareness campaigns and political action; b. Development of methods to promote scientific information on biodiversity in consumer decisions, for example, through eco-labeling; c. Guidelines for the promotion of products

obtained through the use of biodiversity, which are produced in a sustainable manner, as an alternative source of income at the local level, including programs based on local communities;

f. Study of approaches to develop markets and payment schemes for ecosystem services at local, national and international levels, their advantages as well as potential limitations and risks, and their potential implications for biodiversity and indigenous and local communities; d. analysis of the effects of different incentive measures and impacts on biodiversity in different groups in different geographical areas and over time; e. Methods for assessing the effectiveness of incentive measures, including positive incentive measures and the removal of perverse incentives.

Unfortunately, at the present time, the programme on incentive measures in the country does not exist. The most programmes and policies of the Government do not include measures that promote the conservation and sustainable use of biodiversity components. A number of sectors of the economy – industry, agriculture, fishing, hunting, hiking, mainly use the value of biological diversity, but only certain types of estimated resources, which are widely used in national economic purposes. Potential biodiversity of Kyrgyzstan is not evaluated in economic terms, but it is an essential resource for the development of the country. Strategy of sustainable development of the country until 2017 provides limited measures for the conservation and sustainable use of biodiversity, especially in the forest sector. Measures to stimulate and promote the initiatives of the private sector, do not consider incentives interest for biodiversity conservation.

As interventions of impact to protect biodiversity in most cases only disincentive effects in the form of fines and penalties are used. Currently positive stimulus is being developed.

Thematic programmes

Agricultural biodiversity

According to the decision of the COP III/11, held in Buenos Aires in November 1996 a multi-year programme of work on biological diversity, with the following objectives was adopted:

Promote a positive effect and mitigate the negative impacts of agriculture on biodiversity in agro-ecosystems and their interface with other ecosystems;

Promote the conservation and sustainable use of genetic resources of actual and potential value for food and agriculture, fair and equitable sharing of benefits arising from the utilization of genetic resources.

Provide an overview of the status and trends of development of agricultural biodiversity.

Identify adaptive management practices, technologies and policies, which promote the positive effects and reduce the negative impacts of agriculture on biodiversity, and enhance productivity and capacity to sustain livelihoods through expanding knowledge, understanding and awareness about the multiple goods and services provided by different levels of agricultural biodiversity economy. Strengthen the capacity of farmers, indigenous and local communities, their organizations and other stakeholders, for the sustainable management of agricultural biodiversity.

Support the development of national plans and strategies for the conservation and sustainable use of agricultural biodiversity and to promote their mainstreaming and integration into sectoral and cross-sectoral plans and programmes.

The work programme was approved by the COP at its fifth meeting in Nairobi in May 2000 (decision V / 5, annex). The programme also addresses the following cross-cutting initiatives: the International Initiative for the Conservation and Sustainable Use of Pollinators, the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity,

International Initiative on Biodiversity for Food and Nutrition, Genetic Use Restriction Technologies (GURTs).

To implement this program the National Center for testing varieties and genetic resources genetics bank for storage of genetic resources was established. An expedition to collect wild relatives of agricultural crops according to the memorandum signed with Xinjiang Academy of Agricultural Sciences of China (with financial support from CACHE PRC) was organized. Today, 602 samples of cereal, pulses, oilseeds and commercial crops are stored for a long term. In the Field site of the Genetics bank there is a collection of 310 varieties of fruit, 93 varieties of ornamental and 5 varieties of woody crops. Total number of a collection consist of 1010 samples. The Institute of Biotechnologyof the National Academy of Sciences germplasm bank was established, it includes certain types of plants, related to genetic resources.

Certain species of the genetic resources (wild relatives of cultivated plants), such as almonds Petunnikoff - *Amygdalus petunnikowii Litv.,* Grouse Edward - *Fritillaria eduardii* (A. Regel ex Losinsk.) Vved., Nedzvetski apple - *Malus niedzwetzkyana* Dieck, apple Sievers - *M. sieversii* (Ledeb.) V. Roem., Central Asian pear - *Pyrus asiae-mediae* M.Pop., Korzhinskii pear - *Pyrus korshinskyi* Litv., *Tulipa anadroma* Z. Botsch., tulip Greig - Tulipa greigii Regel, tulip Kaufman - Tulipa kaufmanniana Regel, Kolpakovsky tulip - *Tulipa kolpakowskiana* Regel, Ostrovsky tulip - *Tulipa ostrowskiana* Regel, Zinaida tulip - *Tulipa zenaidae* Vved., uzunahmatsky grapes - *Vitis usunachmatica* Vass. preserved in the collection of the Botanical Garden of the National Academy of Sciences of the Kyrgyz Republic.

The country implemented a programme for the resumption of apple Nedzvetski - *Malus niedzwetzkyana* Dieck and nursery was planted in the Sary-Chelek Reserve. From 2010 to 2013 with the support of FFI (Small grants programme) in the village Gumhana a school nursery for growing some woody relatives of crop plants such as apple Nedzvetski - *Malus niedzwetzkyana* Dieck, *Armeniaca vulgaris* L. etc. was organized.

It is planned to strengthen the legal framework for the sustainable use of agricultural biodiversity. A draft law of the Kyrgyz Republic “On Bee farming”, a draft of the State Programme of development od cooperative movement in the Kyrgyz Republic for 2013-2016, the draft State Programme to conserve and enhance soil fertility in the Kyrgyz Republic for 2012-2015., Crop Development Programme in the Kyrgyz Republic for the period of 2011-2015, a draft concept on development of animal husbandry in the Kyrgyz Republic for 2011-2015, a draft strategy for the sustainable management, use and improvement of pastures in the Kyrgyz Republic for 2011-2015 were developed.. To assess the state of biodiversity “State Register of varieties and hybrids of plants approved for use in the Kyrgyz Republic” was developed.

Biological diversity of inland waters

Under the programme of the study of biological diversity of inland water the following activities were implemented.

Before the start of the summer tourist season of 2008, the bottoms of the Issyk-Kul Lake:the costs of the town beach Cholpon-Ata city, sanatorium “Blue Issyk-Kul”, “Golden Sands” were cleaned for the first time. 3 tons of garbage was raised and removed from the bottom of the lake. Present time, the State Administration monitors the state of the waters of the lake, the results of which will identify areas of clean waters of the Lake. Some measures to reduce pollution of the Issyk-Kul Lake was carried oud, in particular, installation of purification plants in resort centers. orudovanie resorts treatment facilities. Construction of purification plants in resort centers: “Ilbirs” in Bosteri village, “Talisman”, “Salamat”, “Caprice” are started. However, they are not enough. Purification plants in the resort area of the Issyk-Kul Lake, Karakol, Cholpon-Ata and Balykchi cities morally and physically worn out and there is a need of their urgent renovation.

The Law of the Kyrgyz Republic as of August 13, 2004 No.115 "On Sustainable Development of Ecological and Economic System "Issyk-Kul"" was approved, it prohibits economic and other activity that violates the natural development of natural processes or threatening adverse effects on natural complexes and objects on the territory of the EES "Issyk-Kul", in particular: - chemical pollution of the Issyk-Kul Lake, or its parts, as well as the catchment area, associated with discharges and emissions of harmful substances, the use of pesticides, agricultural chemicals, radioactive substances, the operation of transport, accommodation and movement of waste production and consumption, as well as the discharge of domestic and industrial waste waters into the lake and rivers flowing into it; - physical change in the state of the Issyk-Kul Lake, or its part (water temperature changes, the fluctuation of the outside water level). Unfortunately, there is a lack of a ban on use in a basin of the lake detergents, the nondegradable wastes in the environment;

- Biological pollution of the Issyk-Kul Lake, associated with the use, breeding or acclimatization aquatic animals and plants, not peculiar to the ecological system of the Issyk-Kul Lake and water bodies that have permanent or temporary connection to the Issyk-Kul Lake. The Concept of Sustainable Development of Ecological and Economic system "Issyk-Kul" for the period up to 2020 was approved by the Decree of the President of the Kyrgyz Republic on February 10, 2009 No. 98. Currently, in the framework of the grant from the Turkish International Cooperation Agency (TICA) the equipment for Ton state hatchery was purchased.

In order to prevent unsystematic and uncontrolled destruction of wild animals, including those including in the Red Book, Issyk-Kul Oblast State Administration adopted a resolution "On a moratorium on hunting wild animals in the territory of Issyk-Kul oblast" as of November 6, 2007 № 294, the fulfillment of which is not proper.

A moratorium on catching all kinds of fish in the Issyk-Kul and Son-Kul Lakes was introduced.

7 species of fish, 14 species of birds and two species of mammals of inland waters, listed in the Red Book of the Kyrgyz Republic (2007).

The project to restore some of the endemic species of fish was implemented, but unfortunately this goal was not achieved. There also was a project, which controlled the number of acclimatized species - walleye, which threatens the survival of endemic species. It resulted an increase of the number of endemic species of fish - Issyk-kul stunned fish.

A significant part of the internal waters of the republic is the reserves. So the largest pond the Issyk-Kul Lake is considered as the Biosphere Reserve (thus, actually a regime of zoning was not introduced, and the lake itself is not legally protected as a natural object.)

Moreover, a substantial part of the coast is situated in the Issyk-Kul State Reserve. The Chatyr-Kul Lake is also part of Karatal-Dzhaparyk reserve. Some smaller lakes such as the Sary-Chelek and Kulun are located on the territory of Sary-Chelek Biosphere Reserve and Kulun-Ata State Reserve. The Issyk-Kul, Son-Kul and Chatyr-Kul lakes are part of the Ramsar network and their waters are of international importance.

An inventory of the species composition of the individual components of biodiversity of some reservoirs held irregularly by staff of Biology and Soil Institute of the National Academy of Sciences, within the various projects. This activity is unsystematic and does not cover everything, even the most important groups due to the lack of professionals.

Biodiversity of arid and sub-humid lands

Arid and sub-humid lands occupy a large area of Kyrgyzstan and have a high level of biodiversity with a significant number of endemic species, which is an important component of biodiversity. Nevertheless, special programmes for the conservation of biodiversity of arid and sub-humid lands are not planned and implemented. Under the development of various concepts

and strategies, these lands are considered in general. The issue of preserving the biodiversity of arid and sub-humid lands in the National Plan of Action to Combat Desertification is not considered, but some of sections of the plan, in particular, poverty reduction, restoration the capacity of pastures will contribute to the biodiversity of arid and sub-humid lands. The state of the biodiversity of arid and sub-humid lands and the load on them are not being assessed. Limited information on the state of biodiversity of certain territories was obtained within studies of expeditions organized in the framework of different projects.

In several studies key areas for the conservation of arid and sub-humid lands were identified (Lazkov et al., 2002). These areas also were considered as appropriate for establishment of state reserves. However, a number of areas, which are important for biodiversity, have not been taken into account. They are located mainly in the low and densely populated areas, so they were not even included in the number of potential areas for the organization reserves.

Mountain biodiversity

Mountain areas cover more than 90% of the territory of Kyrgyzstan, so their biodiversity is important in maintaining biodiversity in general. They are characterized by extremely high diversity of ecosystems and species, including endemic. At the same time, mountain ecosystems are particularly vulnerable to natural ecosystems. The mountains provide a livelihood for many people, they are important sources of water, mountains are a concern for development of ecotourism. Natural resources of the mountain areas of the country play an important role in the life of Kyrgyzstan. However, the expansion of human activities may lead to the destruction of fragile mountain ecosystems. In this regard, development of special integrated programmes for the conservation of biodiversity is important.

At the 7th meeting of the Conference of the Parties (Malaysia, 2004), a special attention was paid to mountain biodiversity, and by the decision VII/27, the Programme of work on mountain biological diversity was adopted. The overall objective of the program is restriction of mountain biodiversity loss by 2010 at the global, regional and national levels, through the implementation of the three objectives of the Convention on Biological Diversity. The programme also considers a contribution to poverty alleviation in mountain areas and in the valleys, directly depending on the mountains (goods and services provided by mountain ecosystems). The programme consists of three main elements: Direct actions for conservation, sustainable use and benefit-sharing; Measures for the implementation of conservation, sustainable use of biodiversity and benefit-sharing; Supporting actions for conservation, sustainable use and benefit-sharing; and includes 14 strategic goals.

In the programme on mountain biological diversity goals and activities that are specific to mountain biological diversity are identified. Implementation of the programme of work aims to contribute to poverty alleviation in mountain areas and in the valleys, depending on mountain ecosystems, and thus to contribute to the objectives of the Strategic Plan of the Convention on Biological Diversity, the Plan of Implementation of the World Summit on Sustainable Development and the Millennium Development Goals. Since most of the territory of the Republic belongs to the mountainous areas, all measures taken for the conservation of biodiversity can be classified in the category. The country adopted programmes, laws and regulations for the protection of biodiversity. For the sustainable use of mountain biological resources and to maintain genetic diversity in mountain ecosystems in the country, a number of specially protected natural areas was created.

The Law “On traditional knowledge and associated genetic resources” was adopted, it considers the creation of conditions for stimulating activity of holders of traditional knowledge and recognition of their rights in decision-making. The environmental impact assessment (EIA) for certain types of impact on the environment, particularly in the construction and mining

operations, are conducted. Surmatash State Reserve (2009) and Dashman State Reserve (2012), as well as the State Natural National Park "Sarkent" (2009) were created. State forestries plant forests under the support of various projects. A programme of inventory of species diversity in the protected areas for vertebrates, terrestrial higher plants, objects of the Red Book, major ecosystems and some other groups of species is implemented. The National Forest Inventory was made. Standardized records of the number of commercial and hunting animals are regularly conducted.

Biodiversity of mountain ecosystems experiencing growing negative anthropogenic impact: overgrazing, illegal logging, hunting, development of transport infrastructure, the local mining industry unregulated recreational load and other activities among them.

Forest biodiversity

Despite the fact that forests cover a relatively small area in the country, they play a special role. Forest communities provide important recreational and aesthetic, cognitive, educational functions are the source of non-timber forest products (mushrooms, berries, nuts), as well as wood for construction purposes and for heating homes. Everything as grass, and wood, are important in the binding of CO_2 and oxygen supply. Forest biodiversity is all life forms, which live in forested areas, including trees, herbaceous plants, animals and micro-organisms.

At the sixth meeting of the Conference of the Parties (COP) in 2002, the expanded Programme of work on forest biological diversity (decision VI / 22, annex, paragraph 10) was adopted. It was developed by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) (recommendation VII / 6, annex). The expanded programme of work on forest biological diversity consists of three programme elements, 12 goals, 27 targets and 130 measures. To achieve these objectives, the Programme on Transition to Sustainable Development of the Kyrgyz Republic for the period 2013-2017 was developed and approved by the Governmental Decree as of April 30, 2013 № 218. It includes issues in the field of environmental protection and rational use of natural resources. One of the four priorities of this Programme is to conserve biodiversity and to restore natural ecosystems in conditions of a changing climate. In this framework two objectives were identified: 1. to provide conditions for the preservation of natural ecosystems by expanding protected areas up to 7% of the country and to strengthen their capacities; and 2. to ensure the conservation of forests until 2017 at a level not less than 5.62% of the country's territory.

Taking into account the challenges and issues related with global climate change, priorities of the Kyrgyz Republic on adaptation to climate change until 2017 were developed, it includes adaptation measures for key sectors: water resources, agriculture, public health, climate emergencies, forest resources and biodiversity. UNDP "Restoration of riparian forests in the floodplain of the Chu and Kok-Moinok rivers of Kyrgyzstan" Project and KOICA "Strengthening the potential of forests conservation of Kyrgyzstan" Project as well as others were implemented. Within the framework of the GEF-5 the following projects were launched: FAO/GEF project "Sustainable management of mountain forests and land resources of the Kyrgyz Republic under climate change conditions" and the UNDP/GEF "Improving coverage and effective management of protected areas in the Central Tien Shan" Project. The European Union "Management of forests and biodiversity, including environmental monitoring" Regional Project was launched as well (FLERMONECA).

From 2008 to 2010 the first national forest inventory of the Kyrgyz Republic was conducted and a database was created. The results of the inventory was approved by the Governmental Decree of July 26, 2011 № 407 and published as a brochure "Integrated Assessment of Natural Resources for 2008-2010". It contains statistical data analysis and evaluation of tree and shrub resources of Kyrgyzstan.

State forestry organizations planted forests on an area of about 3,000 hectares; the trees were planted in the framework of different projects. Workshop on assessment of the impact of climate change on some species of woody plants was conducted with the support of FFI.

An updated version of the Concept of Development of Forestry of the Kyrgyz Republic until 2025 was developed and approved by the Government of the Kyrgyz Republic (2004). The strategic direction of this concept is to improve the system of joint forest management and leasing affairs. The part of this concept is the development of collaborative forest management, which enabled local people, along with state and local government, to take part in the planning of forest management activities, including activities for the conservation of biodiversity in the forest sector. On the basis of this concept the National Forest Programme for 2005-2015 was developed, it is aimed at ensuring the forest safety and restoration. The National Action Plan for Forestry Development for 2006-2010 to ensure the conservation of biodiversity in the forest sector also was developed to contribute to these activities.

In order to implement these programmes forest management activities on conservation, protection and restoration of forests with the participation of regional, district administrations, local authorities and forestry enterprises were implemented. Since 2003 Kyrgyzstan cooperated with the FAO. The following FAO projects were implemented since that period: project on the harmonization of legislation on protected areas, FAO TCP / KYR / 3102 (D) "Strengthening capacity for assessment and monitoring of forest and tree resources in the country" ("Capacity Building for National Forest and Tree Resource. Assessment and Monitoring") Project, TCP / KYR / 3203 "Development of production pistachios and walnuts in the Kyrgyz Republic" Project. In 2004 the NFP Facility, FAO supported a note on the implementation of the national forest policy of Kyrgyzstan. Since 2006, the NFP Facility has supported the following projects: 1. The implementation of forest policy in Kyrgyzstan through the dissemination of information about the involvement of local communities into the joint forest management. 2. Socio-economic assessment of the impact of afforestation and reforestation in the local community. Implementing organization is Institute of Ecology and Water Problems. 3. Determination of the definition of "forest" in the clean development mechanism to attract investment for afforestation and reforestation. Implementing organization is PF "PIU". 4. The publication of the Red Book of the Kyrgyz Republic. Implementing organization is PF "PIU", etc. 5. Improvement of the system of financing forestry of the KR. Implementing organization is Institute of Forest named after P.A. Gana of the National Academy of Sciences. 6. Improvement of forest legislation of the Kyrgyz Republic. Implementing organization is NGO "Independent Ecological Expertise". A moratorium on the cutting of valuable trees was introduced. A number of nature reserves and national parks were established. Since submission of the 4th report two state reserves were organized: Surmatash State Reserve (2009) and Dashman State Reserve (2012), as well as the State Natural National Park "Sarkent" (2009), the junipers are protected in the first reserve and walnut-fruit forests – in the second.

Mainstreaming of biodiversity issues in poverty reduction strategies and other key cross-cutting policy tools

The Article 13 of the National Poverty Reduction Strategy for 2003-2005 "Environmental management" includes the basic principle of nature stabilization strategy, a comprehensive rationalization of the use of natural resources without threaten the long-term sustainability. It is necessary to monitor and evaluate pastures in order to introduce a rational system of pasture rotation and grazing control; to expand and develop a national network of protected areas, increasing their area by 25% by 2005; increase the area of forest cover in the republic up to 6% by 2010. The development strategy of environmental protection should be based on two fundamental principles – the principle of integrating economic and environmental

policies. There is a need of development of new legislation in the field of environmental protection and recycling of legislative framework in accordance with international standards.

Country Development Strategy (CDS) for 2009-2011 is a strategic vision for the development of the Kyrgyz Republic until 2011 and is an updated version of the CDS for 2007-2010. The strategic goal of the new CDS is improving the quality of life through increased economic growth, improved environmental quality. The development of the CDS was based on the principle of sectoral and cross-sectoral partnerships, working groups with representation of all the sectors were involved into the development process, conducted a large number of discussions and recommendations for improving of the document.

Experts of SAEPF with the support of the UNEP and UNDP "Environment Protection for Sustainable Development" Programme developed "Agenda of XXI century the Kyrgyz Republic" and the Concept of transition of Kyrgyzstan to sustainable development. One of the main concepts is environmental sustainability and rational use of natural resources through the transition to economical use of non-renewable and sustainable use of renewable resources. Strengthening of economic and environmental links, formation of environmentally oriented economic system were also considered in the document. In the framework of this document strategic priorities of Kyrgyzstan for transition to sustainable development and the following targets for biodiversity conservation till 2010 were identified: development of Cadastre of biodiversity of the KR; to expand and develop a national network of protected areas, to increase their area of existing ones; genetic conservation in-situ and ex-situ; to increase the area of forest cover the territory of Kyrgyzstan till 6% by joint efforts of the government, local communities and the private sector; actively involve local communities and NGOs to the preservation of biodiversity in their territories.

As part of the ICSD activities the Sub-regional Strategy on Sustainable Development (SSSD) of Central Asia was developed. Under the preparation of SSSD CA the principles of Agenda XXI century, the Millennium Development Goals and the Plan of Implementation of the World Summit on Sustainable Development were considered. SSSD CA is the agreed focus of Central Asian countries, defining common approaches and directions to create an enabling legal, institutional, economic, environmental, information and other conditions for achieving sustainable development in the region.

With the support of UNEP in 2006, Central Asian Framework Convention on Environmental Protection for Sustainable Development was elaborated. This Convention was signed by Kyrgyzstan, Tajikistan, Turkmenistan, Kazakhstan and Uzbekistan in the process of negotiation to accede to this Convention.

With the aim to preserve land and water resources Kyrgyzstan has joined to the Central Asian Countries Initiative for Land Management (CACILM), which is an innovative international cooperation of donors to support the development and implementation of the Framework Programme at the national level. The Programme is an important document aimed at combating land degradation and sustainable management of natural resources of the country, including the conservation of biodiversity. In the implementation of the Programme state and public bodies, donors, local communities and civil society are participating.

Mainstreaming of biodiversity in the various sectors and the results achieved in mainstreaming biodiversity in each sector

For effective biodiversity conservation there is a need of the involvement of various stakeholder groups from the direct users of natural resources, NGOs and researchers to decision-makers into solving this issue. This requires a constructive dialogue among different interest groups, determine the points of intersection, the evaluation capacity of all parties to extend the opportunities of partnership. Participation of all stakeholders in addressing environmental

management is crucial to the successful implementation of environmental policies in the country and the region as a whole.

The main stakeholders in the conservation and sustainable use of biodiversity

Non-government organizations

Non-governmental organizations have an important influence on the decision-making process in environmental management. This includes the development of national programmes and legislation. The most active NGOs in the country that participate in projects implementation if the area of biodiversity protection are: Ecological movement "Biom" dealing with environmental education; Public Union "Independent environmental appraisal" - public environmental appraisal and the protection of the public interest; Ecological movement of Kyrgyzstan Aleine" - biodiversity protection; Public association "NABU Kyrgyzstan" - biodiversity protection; Public Foundation "CAMP-Alatoo" - works with the local population for the rational use of natural resources in mountain areas and many other organizations, Rural Development Fund (RDF) promotes initiatives based on local needs and aimed at poverty alleviation and sustainable rural development.

A number of projects in different areas of the country were implemented with the support of GEF-UNDP with focus on environmental issues.

Very important direction associated with people's friendly relations with nature, traditions and cultural biodiversity is promoted by the Christensen Fund. Under the support of the Foundation the last decade the projects connected to the nomadic people and their relations with nature, revival of agro and biodiversity are implemented, that introduce best practices, attracting the capacity of culture and education for the re-cultivation of the careful, partner relationship to Mother Nature.

As a result of projects and information campaigns, environmental NGOs cover broad sectors of the population and contribute to the preservation of biodiversity at the level of local communities, and protect the interests of the public. Public organizations put efforts to reforestation and struggle with the poachers.

Agriculture

The agriculture affects biodiversity through overgrazing of cattle, expansion of arable land, destroying the habitats of animals and plants. Pastures have been particularly affected that makes about half the country's land. As a result of overgrazing in pastures their productivity decreases, pollution increases, the composition of the plants is changed in favor of non-edible species. The growing number of domestic animals is a factor of concern for wild animals.

MAWRPI includes the Department of fisheries, which is the authorized body for the development of the fishing industry - a major sector of the economy that cover a wide range of activities related to the preservation, reproduction and exploitation of fishery resources. The objective of their activity is a persistent and increasing fish stocks, development of fishing and aquaculture. The Decree of the Government of the KR dated April 22, 2008 no. 161 adopts the fisheries development programme of the Kyrgyz Republic for 2008-2012. Настоящая This programme defines the main directions of the state policy in the field of development of the fishing industry in the long term. The purpose of the programme is to create a legislative framework for fisheries activities in the Kyrgyz Republic. Among the functions of the Ministry is to provide veterinary-sanitary and phytosanitary protection, provision of the veterinary and phytosanitary control over harmful and dangerous organisms spread on the territory of the Kyrgyz Republic, their identification, localization and liquidation of their proliferation, as well as activities for the rehabilitation and restoration of fertility of agricultural lands, and the development of pastures. The Decree of the Government of the Kyrgyz Republic as of February

20, 2012 approved the regulations for the State Center for testing of varieties and plant genetic resources of the Ministry of agriculture and land reclamation of the Kyrgyz Republic, one of their tasks is to preserve genetic resources for present and future generations. The Centre organized the Bank of genetic resources. However, not all agricultural development programmes take into account the issues of biodiversity.

Environmental education

The national reports, environmental reports are issued periodically; seminars and refresher courses for the staff of the regional offices of the environmental protection NGOs are convened. SAEPF posts information on the State of the environment on the site www.nature.kg and provides the space to post any relevant information to all interested parties. However, there is still lack of publications on the state of biodiversity and conservation measures.

In 2011-2012, the school system started to apply a new teaching approach based on the new generation of standards. They include such values as love for his motherland and natural resources. The importance of biodiversity and its conservation is partially covered in the school courses of "Meken Taanuu" (for grades 1-4), "Biology. Plants" – "Botany" (grade 6), "Biology. Animals" – "Zoology" (grades 7-8) and "General biology" in schools with the Kyrgyz language or "General biology" in schools with Russian language of study. However, the standard educational programs give insufficient knowledge and skills in the conservation of biodiversity and the local flora and fauna. In recent years (2006-2012), the Ministry of Education and science of the Kyrgyz Republic and the Kyrgyz Academy of Education issued a number of textbooks and manuals for teachers in Kyrgyz language environment, including the conservation of biodiversity (see list in annex 1.). Currently the country has also developed a number of textbooks and manuals on ecology and sustainable development for schools, but it is not sufficient for complete coverage of the country schools. Lack of textbooks, teaching and methodical aids for teachers for the preservation of biodiversity, the problem of the conversion of the existing manuals on Russian, Kyrgyz or other languages hindered the integration of biodiversity conservation ideas in school education programs. Only the pilot schools are partially provided with video, new techniques, educational posters. In 2011, the teachers and students of pilot schools in Kyrgyzstan joined the European education programme by becoming parties to the innovation project "Green package for Central Asia" (Green Pack). Green Package on the CD-ROM is the interdisciplinary multimedia kit containing information on twenty-five subjects in the field of environment and sustainable development. The resource is aimed at helping students of a new system of values and new patterns of behaviour in school, at home and in society. This project was implemented by the regional environmental Center for Central Asia (CAREC) in cooperation with the regional environmental Centre for Central and Eastern Europe (REC-CEE) - the developer of this resource and its Executive Director in 16 countries in Europe and the CIS. A great contribution to the development and adaptation of materials at the regional level was made by the Ministry of Education and science, SAEPF, NGO "Akmena". It is expected the inclusion of green Package for CA in the list of textbooks and teaching aids, recommended for use in educational institutions. In 2012, the regional environmental Centre for Central Asia (CAREC) in collaboration with the Goethe-Institute, the Ministry of education and science of Kazakhstan and Kyrgyzstan, and with the support of the Gesellschaft für Internationale Zusammenarbeit (GIZ) launched a new project "Green package for Central Asia-Glaciers". The main objective of the project is to raise the significance of climate change, mountains and glaciers, as well as promotion of mitigation options in Central Asia by introducing Visual and innovative green training aid package for glaciers in CA schools, improving the skills and competences of teachers and students in promoting sustainable development. According to the law of the Kyrgyz Republic "On education" the schools have the right to use an additional educational component. As a result more than twenty schools of innovation type work on individual training plans that

allow them to introduce new courses such as “biodiversity conservation”. Many schools have “environmental” rooms, cabinets and corners created especially for the courses and electives, exhibitions and stands for “Red Book of Kyrgyzstan”.

There are 133 extracurricular institutions that cover more than 80 000 children. After-school environmental education services provides the following types of out-of-school educational institutions: the national children's and youth center for ecology, the study of local culture and tourism, children's educational centers, children's creativity centers, environmental clubs, regional museums, etc.

SAEPF together with the national children's and Youth Centre for ecology, holds Republican environmental competitions “Live, Earth”, “Enter the nature with peace” for students, seminars for teachers of schools of the Republic. April 25, 2012 children’s educational center “Balastan” and PU “Korum” has conducted the event devoted to the flower Aigul. At the beginning of the event the information has been given on the flower Aigul, which is enlisted in the Red Book of the Kyrgyz Republic. There was the project implemented for the conservation and protection of this flower, 8 years ago a nursery was established.

The network of children's and youth environmental clubs established in the Kyrgyz Republic that testifies the growing interest in the issues of ecology and environmental management. WWF'S Mission in Kyrgyzstan is actively working in the field of eco-education, information and support to the existing children's environmental clubs of friends of the WWF “Ak ilbirs” (white snow leopard) and “Kalars”. Every year ecological actions take place that attract a wide range of public – “New Year with no cutting the tree”, “Panda wave”, “March of parks”. Club members regularly conducted open lessons in schools, organized eco troops, contests of pictures, celebrate environmental days. Since 2008 in the frame of the environmental club of friends of the WWF “Ak ilbirs” environmental theater is functioning. It has performances: “Voices of animals”, “ECONET - the net of life”, “Forest-lungs of nature”, “Flowing water”, “Save the Earth”. Many children of this Club are winners of national and international competitions.

However, in the whole country the extracurricular institutions have weak technical, human and financial resources and the conservation of biodiversity are not a priority in their activities.

In Kyrgyzstan, there are more than 50 universities, attended by more than 220000 students. This is one of the highest indicators among CIS countries. In connection with the participation of Kyrgyzstan in the Bologna process the subject “Ecology” (“Basics of ecology”) introduced as compulsory education standards training of bachelors and specialists in almost all areas and specialties. In some cases the course environment is included into other mandatory subject – “Scientific concepts”. In a number of universities bachelors and masters are prepared on “Bioecology”, “Ecology and environment”, “Environmental protection and rational use of natural resources”, “Environmental protection”, “Environment engineering”, “Engineering protection of environment”, “Non-conventional and renewable sources of energy”. The main institutions of higher education to train specialists in the field of biodiversity conservation are the Kyrgyz National University after J. Balasagyn, Kyrgyz State University after Arabayev, Kyrgyz Naryn State University, and Kyrgyz Osh State University.

Since 2012 the Academy of public administration under the President of the Kyrgyz Republic carries out training of top managers and specialists in the field of natural resource management and sustainable development. Graduates of the Academy will gain knowledge and skills in the management of complex social and natural systems of different levels, assessment, sustainability and strategic development of natural systems; skills of designing of model environmental activities, identify and diagnose problems of nature protection, assess the impact of planned constructions or other forms of economic activity on the environment, and conduct environmental monitoring, environmental audits and environmental review. Hannes Seidel Foundation in the framework of its work programme in Kyrgyzstan declared 2012 the year of

protection of the environment. In March a Conference “Ecological education at the local level in the Kyrgyz Republic” was held and the project “Enhancing capacity at the local level in Kyrgyzstan in the field of environmental protection” started its activity. Activities under the project Fund Hannes Seidel Foundation (HSF) should results in the integration of the environmental theme in the training process of master's programs of HSF in the Academy of public administration under the President of the Kyrgyz Republic.

Some publications (see annex 2) may be recommended for the specialists in the field of biodiversity conservation, teachers, students.

A great contribution to the environmental education of the population is made by various community organizations, NGOs, foundations. In 2004 with the financial support of the Soros Foundation Kyrgyzstan, UNV youth project, joint-stock company “Kumtor operating company” etc. the camps for youth in ecodiversity in the Issyk-Kul, the Son-Kul and others were established. The idea of the camp aims at bringing together diverse groups of young people and attracts public attention to environmental issues. Boys and girls are going to find solutions to environmental problems, share knowledge on environmental issues, to participate in environmental activities. In 2009, the NGO "CBT ECO plus" organized at the Son-Kul a camp “Young ecologist” with the purpose of exposing teenagers to the nature, to revive the traditions, culture and customs of Kyrgyz people related to the conservation of biodiversity. In 2012, the development fund youth initiatives organized at the Issyk-Kul the first Republican Youth Eco-educational camp “Green Land”. Young people from all regions of the country participated in educational seminars on environmental issues and environmental protection. Youth of Kyrgyzstan also participates in international youth environmental education camp “Ecology of the Commonwealth” and the school of the young environmentalist – the organizer is the Interstate Fund for humanitarian cooperation of CIS Member States. The main objectives of the camps and schools of the young environmentalist is to attract young people of the Commonwealth of independent States (CIS) to address environmental challenges; creation of a database of youth organizations of the CIS countries potentially willing to participate actively in the protection of the environment; the development of multilateral cooperation.

Health care

Health care is one of the sectors of Kyrgyzstan that uses the plants and their products. Namely, the pharmaceutical industry, the companies that manufacture herbal products including those from wild-growing herbs. In the area of medicinal plants, there is an acute lack of knowledge in commodity stocks and locations of economically important plants, ecological and biological characteristics of the species of rational methods and methods of continuous usage of wild plants. Vegetable and animal raw materials are the basis for traditional medicine, which is part of the traditional knowledge. In this regard, the Ministry of Health of the Kyrgyz Republic with the support of international organizations and private entrepreneurs is working for the sustainable use of medicinal herbs. To do this the operational stocks are set, and sustainable harvesting methods for 10 species of medicinal plants of industrial value were elaborated. The development project of the health care system of the Kyrgyz Republic until 2020 does not provide for any measures for the conservation of biodiversity.

Forestry

Forestry cannot ignore the biodiversity conservation issues. A new concept of development of the forest industry of the Kyrgyz Republic up to 2025as adopted. The strategic direction of this concept is to improve the system of joint forest management and lease relations. Within the framework of this concept community-based forest management was developed that

enabled the local population along with the bodies of public and local administration to participate in the planning of forest management, including the conservation of biodiversity in the forest sector. Based on this concept the national forest programme for 2005-2015 was outlines, which is aimed at preservation and forest reproduction, and the national action plan for forestry development for 2006-2010 biennium to ensure the conservation of biodiversity in the forest sectorIn order to implement these programmes activities for forest protection and reproduction with the participation of regional and rayon administrations, local authorities and forest enterprises are held.

Mining

Kyrgyzstan is rich in mineral resources and a well-developed mining industry. Mining, especially open cut mining leads to the destruction of vegetation, destroys of the habitats of species of animals, and causes the pollution of rivers and groundwater. Ongoing blasting operations are a factor of disturbance for many animals.

Special risks of mining to nature require compulsory measures to protect nature. Before starting the development of natural resources, it is needed to conduct environment impact assessment for the subsequent supervision by the various State and territorial bodies of State Agency for environment protection and forestry, as well as local authorities, environmental NGOs and local communities. Some large companies voluntarily assume the obligations for the protection of biodiversity. For example, the company "Kumtor Operating Company" has developed a strategy and action plan for biodiversity conservation of the mine. This is the first such document, which is developed, in a mining company operating in Kyrgyzstan and a good example of responsible business to nature.

Rural areas

A developed national strategy for the decentralization of public administration and local self-government in the Kyrgyz Republic was developed for 2010 does not include the conservation of biodiversity issue.

Within the framework of the integrated environmental management, the local authorities every year develop the plans of socio-economic development of the territories, that include activities in the field of conservation and the rational use of resources. However, lack of funding for rural regions do not allow implementing all the planned activities. Socio-economic development of the villages undergoes without taking into account the challenges of the conservation of biodiversity, and the development of their infrastructures as well as the strengthening of economic activity cannot not affect ecosystems and biodiversity.

Within the framework of the UNDP/GEF small grants, the local community implement various environmental projects, including the organization of local nature reserves and wildlife sanctuaries, disembarked and forest restoration etc.

Tourism

To date, Kyrgyzstan pays great importance to the development of tourism, but local peculiarities are not considered enough, such as the accessibility of regions, climate, infrastructure and the possible impact of tourism on the environment. By the Decree of the President of the Kyrgyz Republic in 2000 by the concept on the development of tourist industry of the Kyrgyz Republic till 2010 was approved. The goals and objectives are "to implement measures for sustainable tourism development, taking into account the relevant environmental and social requirements". In 2003, the Government developed and adopted a programme of activities for the promotion of tourism in the Kyrgyz Republic till 2010. With the support of the

Aga Khan Foundation, a plan of actions for the integrated development of tourism in the Issyk-Kul region has been developed and approved by Kyrgyz Republic Government resolution as of January 8, 2005, no. 802. The plan includes development of actions for the protection of fauna and flora.

The Government Decree No. dated 112 February 26, 2005 approves "the State program of development of tourism in rural areas up to 2010" (as part of the implementation of the national strategy for the integrated development of the village in the Kyrgyz Republic till 2010). In particular, it refers to the development of CBT-community based tourism, which provides involvement of the tourists in the protection of the environment. In the framework of the Interstate project Europeaid/TACIS project on biodiversity in ЗТШ a training course on the development of ecotourism was held, tourists itineraries Sary-Chelek and Besh-Aral reserves, taking into account the conservation of biodiversity were elaborated.

In Kyrgyzstan hunting tours for foreign hunters are organized mostly on males of the subspecies of the Pamir mountain sheep (Marco Polo sheep) and the Siberian mountain goat, which are carried out in compliance with the procedures of the Convention on international trade in endangered species of wild fauna and flora (CITES).

However, there are some drawbacks in this sector. No recreational and tourism potential of ecosystems was defined, there is no monitoring of tourism pressures on natural objects. There is no certification of environmental public service routes, based on an assessment of the impact of tourism on biodiversity. Kyrgyz community based Tourism Association (KCBTA) is dealing with certification of tourist itineraries, but it does not take into account for the impact of tourism on biodiversity.

Finance, trade and industry

The costs of the public administration in the field of the conservation, protection, reproduction and rational use of biological diversity and the forest management is carried out at expense of the Republican budget based at economical standards, developed by the State agency for environment protection and forestry in the prescribed manner. The Ministry of Finance of the Kyrgyz Republic determines the financing of the conservation of biodiversity and the forest. Mainly it provides funding for the agency itself.

How aspects of biodiversity are included in planning processes

Aspects of biodiversity should be included in planning processes by developing specific plans of action, and define responsible party, the budget for the implementation of measures to protect biodiversity in the implementation of an activity. However, the programmes and plans are primarily declarative in nature, since they do not identify specific actions and actors, and do not set the budget.

The tools used for the mainstreaming of biodiversity (environmental impact assessment, ecosystem approach, spatial planning)

In any sector or sectors of the economy, there is a need to assess the effects of the activity, including on the biodiversity. Apparently, these effects and are counted when taking decisions. Environmental impact assessment (EIA) is an important way of forecasting and monitoring. Through this monitoring, it is possible to ensure an appropriate response to mitigate the negative impact on biodiversity. However, the most important application of this approach in the anthropogenic impact. EIA is one of the mechanisms of an ecosystem approach in man-made impact, as it assesses the impact of proposed activities on biodiversity in flora and fauna, human health etc. In addition to EIA, for industrial plants a state ecological expertise is conducted,

which makes assessment, including assessment of project documents and materials of the EIA. All enterprises engaged in economic activity and other activity, regardless of the form of ownership must necessarily have a positive conclusion of the State environmental expert review. This means that an activity does not exceed the permissible environmental impact.

Another tool is the public environmental expertise (PEE) that uses the methods and tetools of strategic environmental assessment (SEA). Public expertise, as the SEA was of a recommendatory nature. Today Kyrgyzstan is not a party to the Protocol on SEA, but the PEE has a very similar technique, and uses the same source data. The PEE along with environmental factors, evaluates socio-economic factors, that is, it discusses the impact of the proposed activity not only on the environment but also on the man, and that is the principal difference PEE from the State ecological examination. Spatial planning assumes the consideration of long-term effects of various activities.

Collaboration in the implementation of the related conventions and agreements

Intersectoral collaboration is effected in the form of the coordination role of the State Agency on environment protection and forestry of the Government of the Kyrgyz Republic and the Ministry of agriculture and land reclamation of the KR when running the environmental conventions. The Executive Body for 11 international conventions is the State Agency for environment protection and forestry of the Government of the Kyrgyz Republic (Decree of the Government of the Kyrgyz Republic dated January 16, 2006, № 13-r). The Executive body of the Convention to combat desertification (Act of accession from 21.07.1999 No. 85) is designated the Ministry of agriculture and land reclamation of the Kyrgyz Republic. When preparing reports to the secretariats of the conventions all interested parties are involved. Exchange and sharing of data between ministries/agencies, organizations, collecting environmental information occurs at the level of formal appeals and requests, as well as, if necessary, through the creation of inter-ministerial working groups for the implementation of country environmental assessments of environmental conditions and factors influencing it. National reports on the implementation of the conventions are developed by the cross-sectoral groups. Any environmental law is examined by the concerned ministries and departments.

Integration of biodiversity aspects of international cooperation for development, regional and cross-border cooperation

International cooperation in environmental protection is to ensure the sustainable development of the country and the successful resolution of environmental problems. The Kyrgyz Republic pays special attention to the issues of international cooperation for the effective interaction with foreign countries on the implementation of multilateral and bilateral agreements to address cross-border problems in the field of environmental protection and rational use of natural resources, on the implementation of obligations under environmental conventions. Therefore the Kyrgyz Republic is attracting investments into the Republic to solve environmental problems. The Republic became a member of several international organizations in the field of environmental protection, such as: The UN Environment Programme (UNEP), United Nations Development Programme (UNDP), the World Meteorological Organization (WMO), the United Nations food and Agriculture Organization (FAO), the World Health Organization (who), United Nations Educational, scientific and Cultural Organization (UNESCO). Since 1991, the country is a member of the Commonwealth of independent States, the Interstate Environmental Council was created. In 1993, the country entered the World Trade Organization (WTO). Kyrgyz Republic on a regular basis cooperates with international organizations such as UNEP, UNDP, TACIS, the World Bank (WB), the Asian Development Bank (ADB), the Economic Commission for Europe (UNECE), the European Bank for

reconstruction and development (EBRD), the World Health Organization (who), the Organisation for economic cooperation and development (OECD), the Organization for security and cooperation in Europe (OSCE) and others. The Kyrgyz Republic from 1992 onwards is a member of the United Nations Economic Commission for Europe and takes part in the "environment for Europe", as well as one of the first among the Central Asian republics was selected for the preparation of the environmental performance review (EPR). In 2008, a second environmental performance review of the Kyrgyz Republic was developed. As a party to 13 international environmental conventions and 3 protocols Kyrgyzstan is included in the global process of environmental activities, became a full member of the world community and has the right to receive technical and financial assistance from developed countries. Environmental conventions signed and/or ratified by Kyrgyzstan, are global in nature and are of great international significance and Kyrgyzstan is taking definite steps for the execution of the actions taken by the commitments.

Conventions and agreements:

1. The framework Convention on climate change. Act of accession dated 14.01.2000 No. 11.

2. The Kyoto Protocol to the framework Convention on climate change. The law on the ratification as of 15 Jan 2003, no. 9.

3. The Convention on biological diversity. The Act of accession, 26.07.1996. # 40

4. Cartagena Protocol on Biosafety to the Convention on biological diversity. Act of accession as of 6.08.2005, No. 140

5. Convention on long-range transboundary air pollution. Act of accession as of14.01.2000, # 11

6. The Vienna Convention for the protection of the ozone layer. The Act of ratification as of 15.01.2000, No. 16

7. The Montreal Protocol on substances that deplete the ozone layer.

8. The Rotterdam Convention on the prior justification agreement on hazardous chemicals and pesticides in international trade. The Act of ratification as of 15.01.2000, No. 15

9. The Basel Convention on the control of transboundary movements of hazardous wastes and their disposal Decree of the Jogorku Kenesh of ratification as of 30.11.1995,. No. 225-1; The APS decision on the accession of the Kyrgyz Republic dated 18.01.1996 No. 304-110.

10. Convention on environmental impact assessment in a transboundary context. Act of accession as of 12.01.2001, No. 6

11. The Aarhus Convention on access to environmental information and public participation in decision-making and access to justice in environmental activities. Act of accession as of 12.01.2001, No. 5

12. Ramsar Convention on Wetlands of international importance especially as Waterfowl Habitat. The Act of ratification dated 10.04.2002, No. 54. One of the results of adherence to the Convention was giving Lake Chatyr-Kul the status of water-Marsh lands of international significance (2005).

13. The Stockholm Convention on persistent organic pollutants. The Act of ratification dated19.07.2006, No. 114

14. The Convention to combat desertification. Act of accession as of 21.07.1999, No. 85

15. The Convention on international trade in endangered species of wild fauna and Flora (CITES). The Act of Accession, 30.11.2006, No. 192.

Cooperation with international organizations

The Kyrgyz Republic cooperates with international organizations such as the World Bank (WB), the Asian Development Bank (ADB), the Global Environment Facility (GEF), the World Wildlife Fund (WWF), United Nations Economic Commission for Europe, the European Bank for reconstruction and development, European Commission, United Nations Environment Programme, the World Health Organization, UNESCO, the Organization for economic cooperation and development, the Organization for security and cooperation in Europe, and others. In 1992, Kyrgyzstan is a member of the United Nations Economic Commission for Europe and takes part in the "Environment for Europe". Kyrgyzstan is also a member of such an important initiative as the EECCA environment strategy, the priority of the strategy is to create the elements of sub-regional institutional frameworks to address cross-border issues. Since 2003 FAO cooperates with Kyrgyzstan: FAO project on harmonization of legislation on specially protected natural areas, the FAO project TCP/KYR/3102 (D) "Capacity-building for assessment and monitoring of forest and tree resources in the country" ("Capacity Building for National Forest and Tree Resource. Assessment and Monitoring"), the FAO project TCP/KYR/3203 "Development of pistachio and walnut in the Kyrgyz Republic". In 2004, the NFP Facility, FAO supported the note on the implementation of the national forest policy. Since 2006, the NFP Facility supported the following projects: 1. the implementation of forest policies in Kyrgyzstan through the dissemination of information about the involvement of local communities in joint forest management. Ecological movement "BIOM". Training of 28 forestries on the dissemination of information on the implementation of forest policies. The implementing agency is Kyrgyz-Swiss Programme.

2. Socio-economic assessment of afforestation and reforestation impacts on the local communities. Implementing agency is the Institute of ecology and water problems.

3. The definition of "forest" under the clean development mechanism to encourage investment in afforestation and reforestation. Implementing agency is "PIU" public foundation.

4. Edition of the Red Book of the Kyrgyz Republic. Implementing agency is "PIU" public foundation etc.

5. Improving the system of funding for forestry of the KR. Implementing agency is the Forest Institute named after P.A. Ghana of National Academy of Science of the Kyrgyz Republic.

6. Improving forest law enforcement Conference. Implementing agency is public association "independent ecological expertise".

The World Bank has supported the publication of the inventory of genetics fund of Kyrgyzstan. The implementing agencies are the ecological movements of Kyrgyzstan: «Alejne», "Biom", and the of Biology and Soil Institute of National Academy of Science of the Kyrgyz Republic.

Cooperation with CIS countries

Cooperation with CIS countries is carried out in the framework of the Interstate Environmental Council (IEC), established in accordance with the Agreement on cooperation in the field of ecology and environmental protection (signed in 1992 in Minsk). During the period of IEC 13 sessions was held, where the issues of cooperation among the countries participating IEC in the field of ecology were considered and a number of agreements were signed.

Cooperation with Central Asian countries

Central Asian countries to address environmental problems and for regional cooperation in the field of environmental protection have been established regional institutions: the

International Fund for Saving the Aral Sea (IFAS) and the Interstate Commission on Sustainable Development (ICSD) with the Scientific Information Centre (SIC ICSD). The Central Asian Regional Environmental Centre (CAREC) was established with the aim to strengthen and coordinate environmental activities of the Central Asian republics. By decision of the ICSD the Kyrgyz-Tajik Mountain Centre was established in Kyrgyzstan, it is responsible for coordinating the sustainable development of mountain areas in the region, including biodiversity. Kyrgyzstan participates in the Programme of Action to improve the environmental and socio-economic situation in the Aral Sea Basin for the period of 2003-2010.

As part of the ICSD activities under the support of UNDP, the Regional Plan of Action for the Protection of the Environment of the Central Asian Republics (CARs REAP) was developed and approved. Cooperation between the countries of Central Asia is also carried out in the framework of intergovernmental agreements: "On cooperation on biodiversity conservation of the Western Tien Shan" among Kazakhstan, the Kyrgyz Republic and the Republic of Uzbekistan (signed in March 1998); "Cooperation in the field of environmental protection and rational nature resources management" between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic and the Republic of Uzbekistan dated 17 March 1998 (signed by the Prime Minister of the Kyrgyz Republic on March 17, 1998); "Cooperation in the field of plant quarantine" between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan signed on June 8, 2000 in Astana (signed by the Prime Minister of the Kyrgyz Republic on June 8, 2000); "Cooperation in the field of joint management in the use and protection of interstate water resources between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan (1992); a draft agreement on the establishment of a transboundary biosphere reserve "Western Tien Shan", a draft agreement between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, the Republic of Turkmenistan and the Republic of Uzbekistan "On the establishment and management of regional ecological network in Central Asia" were developed. Representatives of Kyrgyzstan participated in the subregional workshop on Biosafety (Dushanbe, 2004), sub-regional workshop on the implementation of procedures on environmental impact assessment in a transboundary context, organized by the Swiss Government, the OSCE Centre in Bishkek and CAREC (2004).

Assessment of the implementation of NSAPBC

NSAPBC goals are very different from those of the conservation and sustainable use of biodiversity, taken in Aichi. In NSAPBC of the KR for 2002-2006 there are 9 main targets. Level of achievement of the target is listed in the table (Table 10). The more information on national targets for biodiversity are in the action plan. The level of these targets are presented in the Table 11.

Table 10. Progress towards Targets of the National Strategy

№	Main objectives of NSAPBC	Level of completion
1	Conservation and restoration of the most important complexes of flora and fauna species, ecosystems and landscapes to a state of sustainable natural reproduction	Not completed
2	Conservation and sustainable use of forest resources, and the annual increase in forest area	Partially completed
3	Expansion the area of specially protected natural areas	Completed

4	Reduction of environment pollution level	Partially completed
5	Improvement of the environmental legislation to ensure effective protection of biological and landscape diversity	Partially completed
6	Increase of public awareness, environmental education and community involvement in environmental decision-making	Partially completed
7	Establishment of economic mechanisms to promote the conservation and sustainable use of biological and landscape diversity	Not completed
8	Attraction of domestic and foreign investment to promote the conservation and sustainable use of biological diversity	Partially completed
9	Contribution to the poverty reduction rate in the Kyrgyz Republic	Not completed
There are only 3 levels of completion (**completed, partially completed and not completed**), as it is difficult to determine the exact percentage of the execution of a target.		

Table 11.

National objectives on biodiversity conservation included into the Action plan

	Actions	**Level of completion**
	Conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural habitat (in-situ)	
1	Expanding the network of the specially protected areas (SPNAs), creation of national parks "Dashman" and "Padysha-Ata" in Jalal-Abad oblast, "Alamedin" in Chui oblast, "Chon-Ak-Suu" in Issyk-Kul oblast	Complete
2	Development and implementation of action plans on the protection of endangered plant and animal species	Partially completed
	Conservation of components of biological diversity outside of their natural habitats (ex-situ)	
3	Creation a nursery for rare and endangered plants in order to their study. Improving nurseries.	Not completed
4	Establishment of a center for the rehabilitation of captive breeding of animals, endangered species, for their reproduction	Not completed
	Sustainable use of biological and landscape diversity	
5	Development policy in all sectors, which ensures the conservation and sustainable use of biodiversity of the Kyrgyz Republic	Partially completed
6	Coordination of the rational use of biological resources by the local population	Not completed
7	Identification of key areas for the development of eco-tourism, taking into account the vulnerability of areas. Development and implementation of measures for ecotourism. Creating equipped ecological routes and sites	Partially completed
	Organizational capacity development and training	

8	Preparation and regular organization of cross-sectoral workshops and trainings for the exchange of experience and information on biodiversity	Not completed
9	Support of researches on biodiversity conservation in the country, particularly on protected areas	Partially completed
10	Preparation and organization of regular workshops and training for the public on development of ecotourism	Partially completed
	Environmental education and public participation	
11	Awareness raising via the mass media (newspapers, radio and TV), environmental scientific and popular publications. The creation and distribution of special video clips and promotional and informational materials (postcards, brochures, etc.) on biodiversity conservation	Partially completed
12	Carrying out of actions, public events in order to raise public awareness on the biodiversity conservation issues	Partially completed
13	Raising of public awareness on national traditions, culture and interrelation with nature	Partially completed
	Identification and monitoring	
14	Update and publication of the National Red Book	Complete
15	Update and publication biodiversity maps and its conservation priorities based on new data obtained in a result of researches and monitoring	Not completed
16	Establishment a data bank on the biodiversity of the Kyrgyz Republic, including an analysis of the available data and update information obtained in a result of monitoring and researches	Partially completed
	Researches	
17	Study of abiotic, biotic and anthropogenic factors affecting the biodiversity of the republic and the development of recommendations for their optimization	Not completed
18	Conducting research on biotechnologies and their possible applications in environmental protection and biodiversity conservation. Determination of the potential risks associated with the use of technology and the development of recommendations on biosafety	Not completed
	Information exchange and access to information	
19	Creation of public information centers with access to information on biodiversity in the country and the world	Not completed
20	Organization of Central Asian regional workshops information exchange on biological diversity in the region	Not completed
21	Cooperation (technical, scientific, interstate, technology exchange)	Not completed
22	Promote international cooperation and exchange of information, resources and technologies	Not completed
23	Development and expansion of bilateral interstate exchange programs for scientists and managers on the biodiversity	Not completed

	conservation issues	
24	Improvement of the system of restrictions on imports or exports of species threatened in accordance with international agreements	Partially completed
25	Publication and distribution of regional Green Book, which lists the ecosystems threatened in Central Asia	Not completed
	Impact assessment	
26	Improvement of methodologies to assess impacts and requirements to be taken into account the impact on biodiversity, their use in assessing the impact of geological exploration, agriculture, mining (including tailings), transport, power lines and other sources of pollution or emissions	Partially completed
27	Monitoring of economic activities, which have the most negative impact on biodiversity	Partially completed
	Stimulating measures	
28	Development of small grants programmes to attract people and local authorities to solve biodiversity conservation issues in the regions of the republic	Partially completed
29	Stimulating the development of ecotourism with maximum involvement of local labor resources and minimal impact on the local culture and biodiversity	Not completed
	Legislation	
30	Development of draft regulations for the conservation of biodiversity, changes and amendments to the relevant legislation of the Kyrgyz Republic	Partially completed
31	Development of normative legal acts on the introduction of restrictions on biological technologies, products and resources that are potentially dangerous for biodiversity and human health	Partially completed
32	Development of normative legal acts on cooperation among governments on the management of transboundary protected areas	Partially completed
33	Development of regulations on environmental audit	Not completed
	Financial resources	
34	Development of system of small grants, interest-free loans and micro-credit projects on biodiversity conservation	Partially completed
35	Conducting trainings on project development and grant applications suitable for international donors	Partially completed

36	Consideration of new funding mechanisms for the conservation of biodiversity	Not completed
There are only 3 levels of completion (**completed, partially completed and not completed**), as it is difficult to determine the exact percentage of the execution of a target.		

Measures to preserve biodiversity components (ex-situ), in particular the establishment of nurseries and genetics banks were partially implemented. Under the Ministry of Agriculture and Melioration of the Kyrgyz Republic genetics bank for conservation of agro-biodiversity (cultivars and their ancestors) was established. There is a genetics bank in the Institute of Biotechnology of National Academy of Sciences for wild plants. However, the existing collection of plants in the Botanical Garden named after Gareeva of the National Academy of Sciences are in poor condition. At the same time nursery for rehabilitation, captive breeding of endangered animals has not been established.

Certain measures to develop policies that ensure the conservation and sustainable use of biodiversity have been taken, but most adopted documents are framework and for their practical applications there is a need of further revision. SAEPF in consultation with the National Academy of Sciences is responsible for coordinating of industrial collection of biological resources in the form of issuing permits for the collection, but the records of collected resources are not made.

Key areas for ecotourism are being determined, but the degree of sensitivity of an area is usually not taken into account. Development and implementation of measures for the organization and development of ecotourism and tour itineraries is carried out with the support of some projects, but usually routes are not properly equipped. Cross-sectoral workshops the exchange of experience and information on biodiversity are not conducted.

Support of researches on biodiversity in the country, particularly of protected areas is carried out in the framework of various projects, but this support can not be considered as sufficient.

The media, including newspapers, radio and TV, show TV programs and publish the scientific and popular articles on ecology and biodiversity protection, but they not enough and not regular. SAEPF publishes a variety of materials related to environmental protection periodically. Different NGOs with the support of several projects develop and distribute a special videos and promotion videos, printed informational materials (postcards, brochures, etc.) on biodiversity conservation. Actions, public events in order to raise public awareness on the issues of biodiversity conservation, as well as informing the public about the traditions, culture and relationship with nature are being conducted. However, these actions are not being held regularly enough.

A new edition of the national Red Book was published, but new maps of biodiversity, taking into account the priorities for conservation are not being published.

Full database of information on biodiversity of the Kyrgyz Republic is not developed, there are only a few publications concerning certain aspects of biodiversity.

There are almost no studies of abiotic, biotic and anthropogenic factors affecting the biodiversity of the republic, as well as research on biotechnology for their possible applications in environmental protection and biodiversity conservation. There are no information centers with access to information on biodiversity in the country and the world. International Cooperation on the exchange of information on biological diversity in the region is not realized, there is no bilateral interstate exchange programs, different categories of persons related to biodiversity conservation.

Some steps to improve methods for assessing the impact of various activities, including geological exploration, agriculture and others were taken. Ongoing monitoring of activities with the most negative impact on biodiversity is implemented.

Small Grants Programme to engage people to the solving of biodiversity issues in regions, stimulating the development of ecotourism with participation of the local population is supported by different projects, but the scope of such activities is insignificant. Regulations on biodiversity are being developed step by step, but there are still many contradictions and gaps in the existing ones. New legal acts also have certain disadvantages.

Financial resources are mobilized quite active, but use of these funds is not always carried out effectively.

Unfortunately, we have to summarize that a significant number of national activities on fulfillment of the commitments under the Convention is not implemented or were not implemented properly. The measures to expand the network of specially protected natural areas (SPNAs) were the most successful. Although, the level of protection remains low for some reason in large part of as in previously arranged, so in newly established. Activities to develop and implement action plans for the protection of endangered plants and animal species (in-situ) were partially implemented, plans for the protection of the snow leopard and some ungulates was developed, but their implementation is not active. We can say that of only 2 objectives (expansion the area of specially protected areas and the publishing of the Red Book) of 36 objectives of NSAPBC, listed in the Action Plan were fully implemented. 18 objectives had been implemented partially. 16 targets were not implemented at all. From 9 NSAPBC objectives, which are outlined in the strategy only 1has been fully implemented, 4 - partially, and 4 objectives were not implemented.

Chapter III. Progress towards Targets for 2020 on the conservation and sustainable use of biodiversity, adopted in Aichi and contribution to the achievement of relevant targets of the Millennium Development Goals till 2015

Analysis of the results achieved in the implementation of NSAPBC

The results of the implementation of the Strategic Plan for the conservation and sustainable use of biodiversity for 2011-2020 and targets for the conservation and sustainable use of biodiversity, adopted in Aichi

Interim evaluation of the implementation targets for 2020 (levels of implementation)

Strategic goal A. Address the underlying causes of biodiversity loss.

Target 1 is not fully completed. Valuation of various components of biodiversity and ecosystem services is just beginning to be determined. A large number of people are aware of the measures that need to be taken for the conservation and sustainable use of biodiversity, but for one or another reason they can not or do not wish to use them.

Target 2 is not completely satisfied. In a number of national and local development plans indicated the need for conservation, but its valuation in most cases not included in the planning and accounting processes.

Target 3 is implemented partially and only in some areas. Thus, when assessing the impact of certain activities, such as mining, the EIA provides measures to reduce the negative impact of these activities on the environment and their mitigation. In most cases, the negative effects of stimuli in the form of fines and penalties are used. Positive stimuli are not developed yet.

Target 4 hardly enforced, stakeholders do not take measures to achieve sustainable production and do not care about the safety of natural resources.

Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use.

Target 5 is not completely satisfied. The rate of degradation of many natural habitats continues to increase.

Target 6 is not satisfied. Fisheries are conducted often illegally and without opportunities for recovery, there is overfishing. Recovery plans have no significant effect on the populations of endangered species, which suffer from overfishing.

Target 7 is not satisfied. Agriculture managed unstable and caused an increase in land degradation and communities.

Target 8. Present time impact of pollution on biodiversity is not identified.

Target 9 is complete partially. The certain measures on regulation and a number of quarantine to prevent the number of species are taken.

Strategic Goal C: To improve the status of biodiversity through protection of ecosystems, species and genetic diversity.

Target 11 is performed actively; the number of protected areas is constantly increasing.

Target 12 is not completely satisfied. There are some programmes for the protection of endangered species, but their activity does not give significant results.

Target 13 partially implemented. The genetic bank of conservation of cultivated plants biodiversity and their wild ancestors is created. However, the programme is in the initial stage of its implementation. Strategies for minimizing genetic erosion and conservation of genetic diversity of the most important species are absent.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services

Target 14 is not completed.

Target 15 partially implemented. State agencies and local communities with the support of some of the projects plant forests and woody plants, which increases the contribution to carbon fixation. However, the restoration of degraded ecosystems is not yet happening.

Target 16 is not completed because the Nagoya Protocol has not been signed yet.

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

Target 17 is partially implemented. New NSAPBC has been developed but not yet adopted by the Government.

Target 18 is partially implemented. A law on the protection of traditional knowledge is adopted, but it is poorly implemented, and local communities do not participate in the implementation process.

Target 19 is partially implemented. Several studies related to biodiversity, its valuation are being conducted. However, such studies are not sufficient; in particular there is a little information about the status of the individual components of biodiversity, which have great practical importance, i.e. the state of pasture ecosystems, forests, etc.

Target 20 is partially implemented, the rate of mobilizing financial resources for biodiversity is gradually expanding, but they are still not sufficient. Even existing resources are not always used effectively.

Examples, which are obviously demonstrate the results of the targets for 2020 or achievements

The area of specially protected natural areas expanded from 5.2% in 2008 to 6.006% in 2012. The national system of specially protected natural areas in the Kyrgyz Republic includes by 11 state reserves (604.3 hectares), 9 state natural parks (302.9 hectares), 10 forests, 23 botanical, 19 geological, 2 and 14 complex hunting (zoological) reserves with a total area of 301.4 thousand ha. Today according data of SAEPF the total area of all categories of specially protected natural areas to date is 1,200,872.0 hectares or 6.006% of the country's area. Since

submission of the 4th report two state reserves were organized: Surmatash State Reserve (2009) and Dashman State Reserve (2012), as well as the State Natural National Park "Sarkent" (2009).

Another example of performance targets is the implementation of the target 17, even though it was only partially implemented. The new National Strategy and Action Plan for the Conservation of Biodiversity were developed at the end of 2013.

Table 12.

Summary of progress towards targets of Aichi for 2020

Strategic goals	Targets	National objective	Activities	Achieved progress	National indicators	Overall assessment by traffic light method
A.						
	1	Not indicated	Decree of the Government on the procedure for determining the valuation of forest land	Value of ecosystem services is defined	Number of decrees	
		Not indicated	Project on assessment a value of ecosystem services in basin of the "Chon-Aksu" river	Value of ecosystem services is defined	Not developed	
	3	Not indicated	Various regulations and laws regulating or prohibiting the removal of the natural flora and fauna are adopted	The legal framework for the biodiversity conservation is strengthened	Number of Laws and Decrees	
B .						
	9	Not indicated	1. Phytosanitary inspection of farmlands to identify and combat the quarantine species	Not indicated	Areas examined and treated, number of quarantine species against which the quarantine activities	

					carried out	
		Not indicated	2. Membership in the WTO that allows to obtain timely information on the status of the quarantine countries	Not indicated		
			3. Evaluation criteria of risks of new quarantine objects on the territory of the Kyrgyz Republic are developed			
C	9	Not indicated	1.Area of SPNAs expanded	The area of specially protected natural areas expanded from 5.2% to 6.006%. Since submission of the 4th report 2 state reserves and 2 national parks were organized	Expansion of SPNAs area	
	13	Not indicated	1. Regulations of the State Center for Testing of varieties and genetic resources of plants is approved, the Bank of genetic resources is established.	«Ex situ» components of agro-biodiversity are protected	Number of components	
D.						
	15	Not indicated	1. Annually the country's forestries plant the forests on the area up to 3000 hectares.	Increased the area of forests	Forests area	
E.						
	17	Not indicated	1. Developed new NSAPBS, but currently is not approved	There is a new NSAPBS, but currently is not approved by the Government		
	19	Establishing a data bank on the	1. The inventory of flora of vascular plants of a number of nature reserves	There is information on the composition	Number of inventory	

		biodiversity of the Kyrgyz Republic, including an analysis of the available data and updated information obtained in a result of monitoring and researches	was carried out 2. and national parks 3. National Inventory of forests was carried out 4. Monitoring the population of some animals, mainly large ungulates was carried out. 5. The Cadaster of flora in Kyrgyzstan. Vascular plants was published.	of the biota of protected areas and other important sites of biodiversity	and other researches	
	20	Not indicated	Develop a system of small grants, interest-free loans and micro-credit projects for biodiversity conservation	Small grants are provided in the framework of GEF/UNDP SGP	Number of grants	
			Conduct trainings on project development and grant applications suitable for international donors		Not developed	
			Consideration of new funding mechanisms for biodiversity conservation		Not developed	
Low performance 			mid-point 		best performance 	

B11. Which measures to implement the Convention in your country contributed to the achievement of relevant targets of the Millennium Development Goals for 2015?

Progress achieved towards the Millennium Development Goals

One of the Millennium Development Goals related to the conservation of biodiversity is Goal 7: Ensure environmental sustainability with the following targets: target 7.A.: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources; target 7.B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss. The target 7B Biodiversity issues include sub-targets 7.1. The proportion of area covered by forest, 7.3 Extraction of fish stocks within safe biological limits 7.6. The proportion of area of SPNAs, 7.7. Proportion of species under the threat of extermination.

For the implementation of the MDGs the following measures have been implemented:

1. Implemented the National Action Plan for Forestry Development for 2006-2010, which considers annual afforestation on the lands of State Forest Fund (SFF) with 2000 hectares and on other lands of 1000 hectares.

2. Continuing the policy on expansion the area of specially protected natural areas. Surmatash State Reserve, State Nature Park Sarkent, "Mountain Aigul-Tash" State Botanical Reserve of republican value were established.

3. The implementation of the State Programme to eliminate the use of ozone-depleting substances. A number of normative legal acts of state regulation of import and export of ozone-depleting substances and products containing them were adopted. On January 1, 2010 the import of chlorofluorocarbons was terminated.

4. Measures to improve the system of awareness, environmental education and training in the field of ecology are strengthened. The official website of the State Agency on Environment Protection and Forestry (www.nature.kg) was created and operates, quarterly "Jer-Ene" newspaper, "Les Tokoy" magazine, booklets, posters, etc. are being published.

5. The legislation in the field of nature and environmental protection is being improved.

B12. What lessons have been learned within the implementation of the Convention in your country? Provide an analysis of lessons learned from implementation, highlight examples of successful and less successful measures, including the unresolved problem. Suggest measures to be taken at the national, regional and global levels for further enhancement the implementation of the Convention at the national level, and in particular the achievement of the strategic goals and targets of the Strategic Plan for the conservation and sustainable use of biodiversity for the period 2011-2020.

The results of the implementation of objectives of the Strategic Plan for the conservation and sustainable use of biodiversity for the period of 2011-2020

To carry out measures for implementation the Convention measures for the implementation of the strategic objectives of the Strategic Plan for the conservation and sustainable use of biodiversity for the period of 2011-2020 are particularly important. Activities to determine the value of biodiversity and ecosystem services assessment, as well as public awareness of the value of biodiversity and the measures they can take to conserve and use it sustainably have been taken for their implementation. Various regulations and laws, which regulate prohibiting the removal of objects of flora and fauna from the nature, have been adopted to eliminate incentives and subsidies, harmful to biodiversity. The distribution of some of the most dangerous invasive alien species is under control. The area of the various protected areas for the conservation of agro-biodiversity are expending, National Centre for testing varieties and plant genetic resources of the Ministry of Agriculture and Melioration of the Kyrgyz Republic was established, one of its tasks is to preserve genetic resources for present and future generations. The center organized the Bank of genetic resources. Annually forestries of the country plant forests on areas up to 3000 hectares in order to increase the resilience of ecosystems and the contribution of biodiversity to carbon stocks. Present time new NSAPBS was prepared, but is still not approved.

An inventory of the flora of vascular plants of a number of nature reserves and national parks, including the National Park "Sarkent" was made in the framework of various projects. the National Forest Inventory was conducted. The state of populations of certain animals, especially large ungulates is being monitored. Financial resources for the conservation and sustainable use of biodiversity are mobilized, but they are not always used effectively.

Thus, in the frameworks of the Strategic Plan for Biodiversity conservation for 2011-2020 only some targets, adopted in Aichi considered and implemented in the country. The expansion of area of different SPNAs is carried out most successfully to compare with other targets.

The measures necessary for the implementation of the Convention at the national, regional and global levels

At the global level

Develop provisions of the Strategy on the biodiversity protection.

Include the most important wetlands (including glaciers) in the List of Wetlands of International Importance (Ramsar Convention) and to grant them the status of protected areas.

Identify key areas of cultural and natural heritages and to submit for inclusion in the List of World Cultural and Natural Heritage (Convention on the Protection of the World Cultural and Natural Heritage).

At the regional level

Implement international evaluation systems of effective management of specially protected natural areas.

Create cross-border specially protected natural areas.

Strengthen international partnerships to monitor the state of biodiversity and share the data.

At the national level

Strategic goal A. Address the underlying causes of biodiversity loss through mainstreaming biodiversity issues in the activities of the government and public.

Integrate the biodiversity issue and its conservation into educational programs, state development plans and programmes.

Consider the biodiversity issue in all types of activities, including production processes.

Develop a methodology for assessment of ecosystem services in the most important areas for biodiversity conservation areas.

Raise public awareness of the value of biodiversity and ecosystem services, the role of these resources in people's lives.

Develop mechanisms for public involvement in decision-making on the conservation and sustainable use of biodiversity, including the management of specially protected natural areas.

Analyze the decisions taken in terms of biodiversity and ecosystem sustainability in the ministries and agencies.

To analyze all activities threaten biodiversity, cancel or change them to prevent or minimize negative impacts on biodiversity and ecosystems.

Develop incentives for the adoption of methods of “green” economy, the gradual transition to environmentally friendly and energy-efficient technologies.

Strategic goal B. Reduce the direct pressures on biodiversity and promote sustainable use.

Develop and implement measures of the optimal anthropogenic pressures (including grazing) on various types of ecosystems.

Develop a national programme for the rehabilitation of degraded pastures.

Develop a state programme on the development of walnut-fruit forests of the Kyrgyz Republic.

Develop a National Action Plan to Combat Desertification.

Support and promote the initiatives of local communities on afforestation.

Take measures to restore populations of endemic fish species to a level of sustainable use.

Develop and approve the Regulations on introduction a list of rare and endangered species of animals and plants of the Kyrgyz Republic.

Analyze the types of pollution, especially of the Issyk-Kul Lake, to develop a programme to reduce the amount of pollution sources.

Record the use of genetic resources and establish a system for the regulation of their use.

Strengthen protection of valuable natural objects and species diversity.

Develop mechanisms to encourage enterprises in the implementation of environmental, resource-saving and low-waste technologies.

Develop an inventory of the most dangerous invasive and acclimatized species and measures to combat them. Improve measures to prevent the introduction of invasive species on the territory of the Kyrgyz Republic.

Develop and adopt a National Programme for the rehabilitation of degraded lands; recover more than 10% of degraded lands.

Strategic goal C. Improve the status of biodiversity through protection of ecosystems, species and genetic diversity.

Develop a Programme and Action plan for the development of specially protected natural areas.

Make an inventory of all specially protected natural areas, to fix their boundaries and status, to develop Regulations on the creation of specially protected natural areas in the Kyrgyz Republic.

Establish new and expand the area of existing specially protected natural areas up to 12% of the country's territory.

Provide coverage of the most threatened natural objects (species and natural systems) by various kinds of specially protected natural areas, if possible.

Update and develop management plans of specially protected natural areas.

Develop programmes for the conservation of species and varietal diversity, stimulate the economic activities on breeding, cultivation of local varieties and breeds.

Identify a set of microorganisms used in traditional home technologies.

Strengthen the capacity of gene banks of agricultural varieties and breeds, as well as rare, endemic and vulnerable plant species.

Develop programmes to preserve and increase the number of individual threatened species.

Strategic Goal D. Enhance the benefits to all from biodiversity and ecosystem services.

Ratify the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization.

Develop and adopt a National Programe on the restoration of degraded lands.

Develop programmes to increase the share of the local community to benefit from ecosystem services.

Implement measures for sustainable development of mountain forests and land resources in a changing climate conditions.

Develop a programme for the sustainable use of pastures.

Strategic Goal E. Enhance implementation through participatory planning, knowledge management and capacity building.

Implement framework documents into concrete measures to protect the environment and adopt updated national strategy and action plan for the conservation of biodiversity and start implementing them.

Review and analyze of the country's existing traditional knowledge and technologies.

Develop regulatory and administrative measures to protect the rights of local communities to own brand and technologies of traditional knowledge and practices.

Improve and standardize the methodology for monitoring the state of biological diversity for its sustainable use.

Analyze the current system of cooperation between state structures for the protection of the environment and rational management of natural resources.

Assess the effectiveness of the financial resources allocated to biodiversity conservation in the country.

Improve the coordination of the use of donor funds aimed at the conservation of biodiversity and ecosystems.

Create new funding mechanisms for the conservation of biodiversity.

Create a mechanism for disbursement of funds obtained from the use of biodiversity and ecosystem services.

Improve the management capacity to mobilize financial resources.

Develop a system of grants, interest-free loans and concessional loans for projects for the conservation of biodiversity.

Implement proposals for funding of various activities and include into planned budgets environmental measures.

Annexes and appendices

Appendix I. Information on a Party, reporting and about the preparation of the fifth national report. Please provide information on the process of preparing this report, including information on stakeholders involved and materials used as a basis for the report

ANNEX II – Additional sources of information

http:/www.undp.kg
http:/www.nature.kg
http://www.donors.kg
http:/www.wwf.ru
http:/www.unep.org
http:/www.caresd.net
http:/www.plant.biotech.kg
http://www.unece.org/env/pp
http:/www.centralasia.kg
http://www.eco-portal.kz
http:/www.eco-expertise.org
http:/www.camp.kg
http:/www.biom.org.kg

ANNEX III. ***National implementation of the thematic programmes of work and plans under the Convention on Biological Diversity or decisions of the Conference of the Parties related to cross-cutting issues***

Table 13.

Implementation of the thematic programmes of activities and plans under the CBD at the national level

Thematic programmes	Global targets and objectives	National targets if there are any	National implementation of measures or taken actions	National contribution into the implementation of global targets and measures	National results	Indicators, used for measuring implementation if there are any
Biodiversity of agriculture	Contribute to the conservation and sustainable use of genetic resources	Conservation of components of biological diversity outside their natural habitats (ex-situ)	Created genetics bank for conservation of agrobiodiversity	There are 602 samples stored for a long period. In the field Genetics Bank there are 310 varieties of fruit, 93 varieties of ornamental and 5 varieties of woody crops. Total samples number sored in the Genetics Bank is of 1010.	A significant part of cultivars are stored in genetics bank and field collections	Number of genetics banks, the number of samples for storage
	Provide an overview of the state and trends of agricultural biodiversity	Not indicated	"State List of varieties and hybrids of plants approved for use on the territory of the Kyrgyz Republic" was drafted to assess the state of agricultural biodiversity	Agro-biodiversity was evaluated	The country's agro-biodiversity There is a review of the state of	Not developed
Biodiversity of inland waters	Improving the conservation of biodiversity of inland waters through the restoration of degraded	Development and implementation of action plans for the protection of	Project to restore some species of endemic fish was implemented	No	The goal was not achieved	The number of species whose numbers have stabilized or restored

	ecosystems and recovery of threatened species	endangered plants and animal				
	Preventing the introduction of alien species that potentially threaten aquatic biodiversity of ecosystems, control and eradicate invasive species	Not indicated	Control over entry into the territory of alien species	Preventing the transfer of adventitious species into the country	Alien species that may threaten biodiversity can not enter the territory or the number of such species significantly reduced	Number of adventitious species , which threaten biodiversity
	Take measures to prevent the invasion of alien species that threaten biodiversity of aquatic ecosystems and their control and removal	Not indicated	Project for the control the number in the Issyk-Kul Lake acclimatized species - pike perch, which threatens the survival of endemic species was implemented.	Measures of control species threaten biodiversity of local endemic species was taken	Reduced the number of pike perch in the lake, as a result endemic species of fish increased	Not developed
	Integration of biodiversity issue into legislation	Development, implementation of plans for the protection of endangered plants and animal species	A moratorium on catching all kinds of fish in the Issyk-Kul and Son-Kul lakes was introduced	Protection of biodiversity of inland waters of 2 large reservoirs of the country was legally supported	The goal was not achieved	Not developed
	Conduct research to improve understanding of biodiversity of inland water ecosystems	Not indicated	An inventory of the species composition of the individual components of the biodiversity of some reservoirs held irregularly by	Research on some components of biodiversity are conducted	A composition of the individual components of biodiversity is known	Number of studies, the number of known taxons

			staff of Biology and Science Institute of National Academy of Sciences, in the framework of various projects			
	Conservation, sustainable use and benefit-sharing	Not indicated	Purchased equipment for Ton state fish hatchery	Measures to preserve some fish species were taken	The goal was not achieved	Not indicated
		Reduction of environment pollution level	The bottom of the Issyk-Kul Lake, as well as the coast area of 30 sq. m was cleaned	Pollution of the large part of the country's largest reservoir is reduced	Improvement of water quality in the Issyk-Kul lake	Level of water pollution
			33 purification plants for resorts on the the Issyk-Kul Lake side was built	Pollution of the large part of the country's largest reservoir is reduced	Improvement of water quality in the Issyk-Kul lake	Level of water pollution
	Adoption of such integrated watershed and river management strategies for the conservation, restoration or improvement of the quality of water resources and the economic, social, cultural, spiritual, other functions and values of biodiversity and ecosystems	Improvement of environmental legislation to ensure effective protection of biological and landscape diversity	Concept of Sustainable Development of Environmental-economic system “Issyk-Kul” till 2020 approved by Decree of the President of the Kyrgyz Republic as of February 10, 2009 № 98	Aproval of the concept, including the conservation of biological diversity	Number of concepts that take into account biodiversity is increased	Number of policies that take into account biodiversity
Forest biodiversity	Conservation, sustainable use and	Conservation and sustainable	A moratorium on the cutting of	Valuable tree species preservation	Woods of valuable tree species are	Not indicated

	benefit-sharing	use of forest resources and the annual expansion of forest area	valuable trees was introduced	are being preserved	being conserved	
	Conservation, sustainable use and benefit-sharing	Conservation and sustainable use of forest resources and the annual expansion of forest area	Surmatash State Reserve (2009) and Dashman State Reserve (2012), as well as the "Sarkent" State Natural National Park (2009) was organized	Preservation of the most valuable forest of juniper trees and walnut-fruit forests are conducted	Woods of valuable tree species are being conserved	Expansion of SPNAs
	Conservation, sustainable use and benefit-sharing	Conservation and sustainable use of forest resources and the annual expansion of forest area	Reforestation is carried out by State forestry organizations under the support of various projects	Annually an area of about 3,000 hectares are planted trees in the framework of different	There is increase in the total forest area, reducing the load on the forest plantations	Expansion of forest area
	Conservation, sustainable use and benefit-sharing	Conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural habitat (in-situ)	UNDP "Restoration of riparian forests in the floodplain of the Chu and Kok-Moinok rivers of Kyrgyzstan" Project was implemented	Carried out the restoration of riparian forests	Conserved and restored floodplain forests of Chu river. The plot of the project was destroyed by fire.	Not indicated
	Knowledge, evaluation and monitoring	Not indicated	The first national forest inventory of the Kyrgyz Republic was held in the	There is information about the area and the species composition of forest	There is the necessary knowledge for sustainable forest	Not developed

			period from 2008 to 2010	communities	management	
Biodiversity of dry and sub-humid lands	Collection and analysis of information about the state of the biological diversity of dry and sub-humid lands and the pressure on them	Not indicated	Key areas for the conservation of dry and sub-humid lands are identified in several studies	There is information on biological diversity of some parts of the arid and sub-humid lands	Important areas for biodiversity conservation of dry and sub-humid lands are identified	Not developed
Biodiversity of mountains	Prevention and mitigation of the negative impacts of key threats to mountain biological diversity	Not indicated	The impact assessment (EIA) is carried out for certain types of impact on the environment, particularly for the construction and mining operations	A strategic assessment of a number of activities on biodiversity of mountain areas is conducted	Reduced the threat to the unique biodiversity of mountain areas	Not developed
	Protection, recovering and restoration of biological diversity of mountain regions	Conservation and sustainable use of forest resources and the annual expansion of forest area	Surmatash State Reserve (2009) and Dashman State Reserve (2012), as well as the State Natural National Park Sarkent (2009) were organized	Preservation of the most valuable forest stands was carried	Conserved massifs of valuable tree species	Expansion of SPNAs
	Promotion the sustainable use of biological diversity of mountain regions	Conservation and sustainable use of forest resources and the annual increase of forest area	State forestries plant forests with support of different projects	Annually forests planted on area of about 3,000 hectares with support of different projects	As a result of an expansion of the forest area the load on the forest plantations is being reduced	Expansion of the forest area
	Respect, preserve and support	Not indicated	The Law of the Kyrgyz Republic "On	Strengthened the legal framework to	There is a legal framework	Not developed

	knowledge, innovations and practices of indigenous and local communities in mountain regions		protection of traditional knowledge" is adopted, its purpose is legal protection, preservation and promotion of the wide application of traditional knowledge, including those based on genetic resources	support the knowledge, practices of local communities	for the preservation and support of knowledge, practices and innovations of indigenous and local communitie s	
	Continue work on identifying, monitoring and evaluation of biodiversity of mountain regions	Update and publish maps of biodiversit y and its conservati on priorities based on new data from researches and monitoring	Programme on inventory of species diversity in the protected areas on vertebrates, terrestrial higher plants, objects of the Red Book, major ecosystems and some other species groups is implemented	A composition of the most valuable components of biodiversity is identified	Contribution to the study of the biodiversity of mountain regions	Number of inventories and the number of objects
			The National Forest Inventory is made	A composition of mountain forests is identified	Contribution to the study of the forests of mountain regions as a whole	Not developed
			Hunting inspection regularly records the number of commercial and hunting species of animals	The number of commercial and hunting species of animals, living in mountains is identified	Contribution to the study of the number of commercial and hunting species of animals, living in mountains is identified	Not developed
			Local monitoring of some objects (endangered species listed in the Red Book of mammals,	The number of valuable objects of mountain regions are identified	Contribution to the study of some valuable objects of mountain regions as a	Not developed

			reptiles and others.) is also carried out in the framework of several projects.		whole	
	Expand education, participation and awareness in in the field of mountain biological diversity	Actions, public events in order to raise public awareness of the problems of biodiversity conservation were held			Increased public awareness on the issues of mountain areas as a whole	Number of events held, public awareness of biological diversity in mountain regions

Tab1e 4.

Execution of decisions of the Conference of Parties, related to cross-cutting issues

Cross-cutting issues	Related decisions of CP, Programmes and proposed measures	National implementation and contribution	Achieved progress	Future priorities
Access to genetic resource and the benefits sharing	Decision X/1 of the 10th COP	The Law of the Kyrgyz Republic "On protection of traditional knowledge", its objective is legal protection, preservation and promotion of the wide application of traditional knowledge, including those based on genetic	The legal framework for access to genetic resources is strengthened	Ratify the Nagoya Protocol
Biodiversity for	Integrate the	Country have	The issue of	Ttransfer the

development	conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies CBD Article 6b, Decision of the 11th COP	taken certain measures to integrate biodiversity conservation into national policies and programmes aimed at reduction of poverty, achievement of the Millennium Development Goals and Sustainable Development	sustainable use of biodiversity is taken into account in a number of sectoral or cross-sectoral plans, programmes and policies	framework plans and concepts into acting tools
Climate change and biodiversity	Facilitating adaptive management through strengthening monitoring and evaluation systems, The 10th COP Decision X / 33	Coordinated programme on inventory of species diversity of vertebrates, terrestrial higher plants, objects of the Red Book, major ecosystems and some other species groups in the protected areas is being conducted	A composition of the most valuable components of biodiversity is identified	Development of a system for monitoring other objects
		The National Forest Inventory is conducted	A composition of forests is identified	Development of a system for monitoring other objects
		Hunting inspection regularly records the number of commercial and hunting species of animals	Number of commercial and hunting species of animals, living in mountains is identified	Development of a system for monitoring other objects
		Local monitoring of some objects (endangered	Number of valuable objects of mountain regions are	Development of a system for monitoring other objects

		species listed in the Red Book of mammals, reptiles and others.) is also carried out in the framework of several projects.	identified	
	Conservation and restoration of forests to stabilize slopes and regulate water flows the 10th COP Decision X / 33 Large-scale implementation of methods of nature protection and sustainable use, including by strengthening networks of protected areas 10th COP Decision X / 33	Forests are plant on the area of about 3000 hectares with support of different projects.	Increased forest area, reduced load on the natural forest communities	A further increase in the area of forest communities and tree plantations intended for household needs
		Workshop to assess the impact of climate change on some types of ligneous plants was held	Information about the possible impact of climate change on the rare species of ligneous plants is obtained	Develop a methodology for assessing ecosystem services in the most important areas for biodiversity conservation
		Impact assessment of activities that may affect climate change is being conducted	There is impact assessment of some types of anthropogenic impact	Assessment of other activities which can impact on possible climate change
		The network of specially protected natural areas is expanded	Reduced fragmentation of habitats of species and improved ecosystems security	Further expansion of the SPNAs network
	Reducing non-climatic loads, such as pollution, over-exploitation, loss and fragmentation of habitats and the impact of invasive alien	Control over penetration into the country of adventive species, as well as the distribution of some certain species of plants and animals on the territory of	Reduced the negative impact of adventitious species on ecosystems	Control of all the most important types of adventive species

	species The 10th COP Decision X / 33	the Republic		
	Agro-biodiversity conservation to create a specialized gene pools in order to adapt crops and livestock to climate change. The 10th COP Decision X / 33	Organized for genetics bank of conservation of agro-biodiversity	Background for the conservation of agro-biodiversity is established	Filling the genetics bank
Invasive and alien species	CBD Article 8 (h) Prevent the introduction of alien species that threaten ecosystems, habitats or species, control or eradicate those alien species, the 9th COP Decision IX / 4	Control over the distribution of some certain species of plants and animals on the territory of the Republic is held	Reduced the negative impact of adventitious species on ecosystems	Control over all the most important types of adventitious species
		A number of scientific articles, including data on the distribution within the republic of new adventive plants are published	Raised awareness about the composition of adventitious species	Further monitoring of all penetrating adventitious species
Global Taxonomy initiative	The programme of work for the Global Taxonomy Initiative, the 10th COP Decision X / 39	Hunting Inspection conducts standardized surveys of the number of commercial and hunting species of animals	Number of commercial and hunting species of animals is known	Other measures on Global Taxonomy initiative
		The National Forest Inventory is conducted	A composition of forests is identified	Other measures on Global Taxonomy initiative

		Coordinated Programme of inventory of species diversity in the protected areas for vertebrates, terrestrial higher plants, objects of the Red Book, major ecosystems and some other species groups is implemented	A composition of the most valuable components of biodiversity is known	Other measures on Global Taxonomy initiative
Incentive measures	CBD Article 11 Decisions Adoption of appropriate incentive measures for the conservation and sustainable use of components Biodiversity the 5th COP, Decision V / 15	Used only disincentive effects in the form of fines and penalties.	No	Develop mechanisms to encourage enterprises in the implementation of environmental, resource-saving and low-waste technologies

Appendix 1. Textbooks and manuals for teachers on the environment, including biodiversity conservation

A. In the Kyrgyz language

• Mambetakunov U.E. Studying the history of the laws of natural science in secondary schools (manual for teachers). - Bishkek: "Al-Salam", 2012.

• Subanova M.S., Botbaeva M.M. Biology: Osumduktor. - Bishkek, 2012.

• Toktosunov A., Beyshebaev K., Mamytova B. Biology: Zhanybarlar. - Bishkek: 2006

Characteristics of medicinal herbs/ from the series “Traditions of the Kyrgyz people” - B: 2010.

• Emilbekova D.A., Subanova M.S. Systemizing the knowledge on Biology of students (Biology course). - Bishkek: “Al-Salam”, 2012.

B. In Russian

• Wildlife of Kyrgyzstan / Chelpakova J.M., Davletbakov A.T., Kustarev L.A. - B .: “Al Salam”, 2011.

• The Red Book of the Kyrgyz Republic. 2nd Edition. Bishkek, 2007. Chief Editor E.Dzh.Shukurov.

• Current status of endemic and rare species of plants / Umralina A.R., Prikhodko S.L., Lazkov G.A. et al. - B .: "Ayat", 2007

• Endemic and rare species of plants in Kyrgyzstan: Atlas. / Compilers - Umralina A.R., Lazkov G.A. «KIRLAND» - B: 2008

• E.Dzh.Shukurov. Essays. Bishkek, 2007

• E.Dzh.Shukurov. Natural foundations of sustainable development. Bishkek, 2009. 172 p.

• E.Dzh.Shukurov, E.E. Shukurov, Zhusupbaeva A.A. The functionality of the ecosystem diversity. \\ Study wildlife Kyrgyzstan. Bishkek, BPI National Academy of Sciences, 2010, pp 65-69.

• E.Dzh.Shukurov, E.E. Shukurov, Zhusupbaeva A.A. Birds - indicators of ecosystem of Inner and Central Tien Shan. Methodological guidance. Bishkek, 2010. 88 p.

• EJ Shukurov Culture. Nature. Tradition. Bishkek, 2011. 59 p.

• Shukurov EJ, V.Ushakov, N.Shagapova, Yu.Tenkova and others. On the footsteps of the snow leopard. Bishkek, 1913. 144 p.

Appendix 2. National indicators used in the report

An important tool for the implementation of the Convention on Biological Diversity (CBD) is the use of indicators - qualitative and quantitative characteristics of the biota, allowing assessing its condition and the degree of load in a result of economic activity, to carry out a comparative analysis, identify trends and make the right changes in political decisions. The need to develop indicators for monitoring biodiversity components is repeatedly mentioned in the documents of different programmes in the framework of the CBD implementation.

Development of national indicators to assess the status and trends of biodiversity and ecosystems protection, to assess these processes, started recently. The following indicators were included in the Fourth National Report on Biodiversity of the Kyrgyz Republic: the protected area of the territory, including special protection as a whole and as a percentage from the territory of the country; the population of hunting and fishing fauna and rare, endangered species with density in their areal (in heads / km^2); the number of species of flora and fauna in the national Red Book, as well as included in the programme of restoration and reproduction, including *ex-situ*; the number of violations infield of Nature Protection, considered and satisfied by responsible authorities (administrative commissions, arbitration courts and so on.); the number of full-time security officers (inspectors, rangers, foresters, etc.) in the whole country and separately for each category (reserves, national parks, foresttries, reserves, hunting reserves); annual funding from the national budget for environmental protection: in general, on the conservation of biodiversity and on structures, including conducting biotechnical, regeneration and reproduction activities (som per 1 km^2).

However, as indicated in the report, these indicators have significant disadvantages. Despite this, some of them can be still used, also the following indicators can be used to assess the state of biodiversity:

- area of protected areas and its correlation with the area of the country
- number of grazing livestock per unit area
- number of mining companies and their occupied area
- area covered by forests
- number of species endangered
- number of adventitious species threatening biodiversity
- number of hunting animals per their areal.

The possibility of using such indicators as the number of grazing livestock, is related to the fact, that mainly only natural pastures are used, which state depends on the number of grazing cattle. Gradation of positive and negative values of a particular indicator should also be developed. As an excessive increase in the forest area can cause significant reduction of other communities.

Since the development of a set of indicators for use at the national level should be considered as a process rather than as an end result, new universal indicators that are more relevant to the effectiveness/ineffectiveness of biodiversity management in Kyrgyzstan was searched.

Usually number of issues should be considered during the development of indicators for use at the national level. Thus, the indicators should be: **politically relevant and meaningful** – indicators should send a clear message and provide information understandable and suitable for policy and management decisions, by assessing changes in the state of biodiversity (or loads, responses, use or capacity), comparable with the original data and consistent with the policy objectives, if possible; **relevant in terms of biodiversity** – indicators should address key properties of biodiversity or related issues (such as state, loads, responses, use, capacity, benefits); **scientifically sound** – indicators should be based on clearly defined, verifiable and scientifically acceptable data, which were collected with help of standard methods with accuracy and precision, or they must be based on traditional knowledge, which are evidenced based; **widely accepted** – the power of an indicator depends on its broad approval.

Participation in the development of indicators of policy-makers, key stakeholders and experts is crucial; **based on affordability monitoring** – indicators should be measurable in an accurate and affordable way and should be a part of a sustainable monitoring system, using baseline data and targets for the assessment of improvements and declines; **based on affordability modeling** – information on cause-effect relationships should be achievable and quantifiable, in order to link indicators of load, state and response; **sensitive** – indicators should be sensitive to show trends and, where possible, permit distinction between human-induced and natural changes. Thus, the indicators should detect changes in systems in time frames and on the scales that are relevant to decision-making, but they must also be resistant to errors to measurement errors and do not affect the interpretation of the results. It is important to detect changes before it is too late in order to correct the problems being detected. It is also necessary to take into account **that there is no single indicator that fully meets all of these criteria at the same time,** so it is important to consider these criteria as the concept of the types of issues that could be taken into account, when selecting or identifying indicators for use on a national scale.

Biodiversity indicators have great potential for assessing the effectiveness of biodiversity management in Kyrgyzstan, to determine the effectiveness of national strategies and policies, evaluation of cross-cutting relationships, statistical reporting and information.

Unfortunately, the special working group specifically for the development or selection of indicators for use in the 5th or following national reports was not created.

As indicators of progress on the implementation of the Strategic Plan for the conservation and sustainable use of biodiversity for 2011-2020 the indicators proposed by the Special Technical Expert Group on Indicators can be partially used for the Strategic Plan for the conservation and sustainable use of biodiversity for 2011-2020 to monitor progress in the implementation of the Strategic Plan at the global, regional, national and subregional levels. This structure of indicators mentioned at the 15th meeting of the Subsidiary Body on Scientific, Technical and Technological Consultancy in its recommendation XV/1, and includes indicators that are available for use at the national level, but their use requires testing and adaptation to national conditions and local environmental standards. For those measures, the result of which is obvious enough, and the results of their decision is expected in the future, it is appropriate to introduce such an indicator, as the number of actions taken or implemented programmes.

As indicators relevant for the implementation of the targets of the Millennium Development Goals indicators of achievement of development goals are suitable, including the Millennium Development Goals, which largely overlap with the proposed indicators for assessment the state of the environment, especially such as the proportion of area covered by forest, and the proportion of protected areas.