Excerpt

from the protocol of the session of the Governmentof the Republic of Armenia

54-10

On approval of the Strategy and National Action Plan of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity

1. Approve

1) Strategyof the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity according to Annex 1.

2) National Action Plan of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity for 2016-2020 according to Annex 2.

Annex.

10 December 2015

Annex 1

toProtocol Decision N 54

of the RA Government

from 10 December 2015

Strategy of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity

I. Introduction

1. Biological diversity (hereinafter biodiversity) is the primary condition for existence of human civilization, it ensures life and development of socio-economic systems. Interchange of nutrients, energy and informationin natural ecosystemsensure productivity, adaptability and resilience of ecosystems. In order to ensure long-term existence of ecosystems it is necessary to identify the consequences of species reduction or their complete loss. In this respect biodiversity conservation is extremely important for ensuring the existence of all forms of life including of human beings. The role of biodiversity is of the same importance for safeguarding ecosystem services in terms of regulation of soil and climatic conditions, provision of clear water, mitigation of the consequences of natural disasters and others. The services provided by ecosystems mainly include provisioning services (food, clean water and air, fuel, resources), regulatory services (climate, prevention of natural disasters, epidemies and erosion, bioenvironment), cultural services (aesthetic, religious, scientific-cognitive, social and spiritual values, traditions, recreation) and supporting services (soil formation, photosynthesis, cycling of nitrogen, carbon, oxygen and water).
2. The Republic of Armenia ratified a number of international environmental treaties,conventions and their protocols related to biodiversity. Implementation of international commitments contributes to effective environmentalprotection and biodiversity conservation. The analysis of international environmental commitments of the Republic of Armenia shows their interlinks, which enables coordinated implementation of bilateral and multilateral actions. Such approach ensures favorable conditions for promotion of international cooperation.
3. In 1999 the Biodiversity Strategy and Action Plan of the Republic of Armenia (hereinafter the BSAP) was developed and submitted to the Secretariat of the Convention on Biological Diversity (hereinafter the Convention) as per requirements of Article 6 provision a) of the Convention. It was accepted by the Secretariat (see the Convention web-site at www.cbd.int). From now on the documents related to the BSAP will be adopted by the Government of the Republic of Armenia according to Article 5 part 1 provision b) of the Republic of Armenia Law on Flora and Article 5 part 1 provision b) of the Republic of Armenia Law on Fauna. The mentioned BSAP was planned for the period of 2000-2004. Afterwards significant changes have been registered in Armenia in the fields of biodiversity related legislative improvements and strengthening of institutional framework, international cooperation has been promoted, a number of projects and new studies have been implemented. In addition, in 2010 the Strategic Plan for Biodiversity 2011-2020 (hereinafter the Plan) under the Convention and Aichi Biodiversity Targets (hereinafter the Aichi Targets) were adopted by the Parties to the Convention during the 10th Conference of Parties (18-29 October 2010,

Nagoya, Japan); theydefine the general frameworks of biodiversity conservation and sustainable use.The BSAP was revised as per requirements of the Aichi Target 17.

4. Based on the Plan and Aichi Targets as well as considering the results of activities implemented in the Republic of Armenia in the field of biodiversity conservation and sustainable useduring recent decades, this document summarizes and analyses the outcomes of biodiversity related activities implemented in the Republic of Armenia as well as presents the Strategy and National Action Plan on Conservation, Protection, Reproduction and Use of Biodiversity in the Republic of Armenia.

II. Fulfillment of commitmentsin the frames of the Convention

5. Fulfillment of commitments by Armenia in the frames of the Convention on Biological Diversity includes improvement of legislative and governance frameworks, establishment of new specially protected nature areas (SPNA), establishment of preconditions for biodiversity inventory and monitoring, promotion of scientific research, implementation of activities on public awareness raising and ecological education.
6. Significant work has been done in the field of extension of international cooperation. In the period of 1995-2014 a number of projects were implemented with financial support of developed countries and international organizations. They weremainly aimed at sustainable management of forest ecosystems, forest rehabilitation with involvement of local communities, establishment of new SPNAs (including transboundary SPNAs) and ecological corridors, protection and sustainable use of freshwater ecosystems, safeguarding conservation of key flora and fauna species and their habitats. The cooperation is ongoing with global and regional international organizations, including United Nations Environmental Program (UNEP), United Nations Development Program (UNDP), Global Environmental Facility (GEF), Word Wide Fund for Nature (WWF), Organization for Economic Cooperation and Development (OECD), European Union (EU), German Agency for International Cooperation (GIZ), German Development Bank (KfW), World Bank (WB), Caucasus Nature Fund (CNF), Regional Environmental Center for the Caucasus (RECC) as well as a number of foreign countries. In the frames of international programs in 2013 the Khosrov Forest State Reserve was awarded with the European Diploma on Protected Areas by the European Committee of Ministers of the Council of Europe, which is the first case in the region. It should be mentioned that in 2012 the Ecoregion Conservation Plan for the Caucasus (ECP) was revised and updated to include similar objectives on biodiversity conservation for the countries of the Caucasus ecoregion. Their incorporation in national programs establishes solid foundations for implementation of international commitments by Armenia at regional level.
7. Over the recent five years significant progress has been registered in the field of *ex-situ* conservation of biodiversity. Thus during 2008-2013, the number of accessions in the Laboratory of Plant Gene Pool and Breeding of the Armenian National Agrarian University increased by 24%, the collection of the “Scientific Center of Vegetables and Technical Crops” State Non-Commercial Organization under the RA Ministry of Agriculture increased 3.5 times and the collection of the Institute of Botany of the National Academy of Sciences of the RA – 2.8 times.In the National Genebank of plant genetic resources for food and agriculture during 2008-2013 the number of accessions increased 8 times.
8. Over the recent five years the works in the field of nature protection have been implemented based on the conceptual provisions and measures stipulated by a number of national strategic documents, which contribute to solution of the problems in the field of biodiversity conservation and sustainable use. The most important documents include Sustainable

Development Program of Armenia for 2008-2012 and the Second National Environmental Action Plan for 2008-2012.

9. To date Armenia submitted to the Secretariat of the Convention five national reports on fulfillment of commitments by the Convention.
10. The BSAP of the Republic of Armenia includes 245 actions aimed at improvement of legislative and institutional frameworks, biodiversity conservation and sustainable use. The structure, strategic directions and the results of implemeted activities were analyzed and summarized in the Fourth National Report submitted to the Secretariat of the Convention. In the process of preparation of the Fifth National Report the progress to date of implementation of the activities in respective 13 directions of the BSAP was analyzed.

11. Among the positive outcomes of the BSAP implementation the followings can be mentioned:

1) Improvement of legislative framework;
2) Improvement of institutional framework, especially related to the management of SPNAs;
3) Establishment of new SPNAs;
4) Implementation of the works on clarification and mapping of the SPNAs boundaries;
5) Development of management plans for national parks and reserves;
6) Development and implementation of the programs on conservation of the species, which are rare or under the threat of extinction (Caucasian leopard, Armenian mouflon, bezoar goat, red deer, black vulture);
7) Revision of the Red Book of plants and animals of Armenia and publication of a new edition (2010);
8) Inventory and approval of the list of natural monuments by the Government of Armenia;
9) Replenishment of fish stock of populations of endemic fish species in Lake Sevan;
10) Forest rehabilitation and afforestation activities were implemented during 2004-2014 in “Hayantar” SNCO and specially protected nature areas (Dilijan and Arevik national pakrs) on the territory of 32100 ha;
11) Development of the National Strategy on Management and Use of Plant Genetic Resources of Armenia;
12) Approval by the RA Government of the RA Strategy and Action Plan on Ecological Education.

12. The analysis of BSAP showed that the main obstacles for partial implementation or not implementation of the planned activities include:

1) Underestimation of the importance of biodiversity and ecosystem services; the value and benefits provided by them have not been still assessed and they are not considered in economic development programs.
2) Insufficient implementation of state stock-taking and monitoring of biodiversity components, which does not allow to predict changes of their status and make realistic and justified decisions regarding their conservation and use.

3) Insufficient cooperation between various state structures and local self-governing bodies, insufficient development of intersectoral relations and weak integration of biodiversity issues in respective sectoral policies.

4) Insufficient mechanisms for enforcement of environmental legislation.

III. The state of biodiversity of the Republic of Armenia

13. Biodiversity of the Republic of Armenia

1) By geographic location Armenia is located in the intersection of three bio-geographical provinces. The diversity of climatic conditions and active geological processes have resulted in formation of various ecosystems and rich biodiversity with high level of endemism(Table 1).

Table 1.Numbers of flora and fauna species of Armenia by taxonomic groups

Kingdom	Taxa	Number of species	Number of endemic species
Fungi	Microfungi	2987	
	Macrofungi	1220	2
TOTAL		**4207**	**2**
Animals	**Invertebrates**		
	Flat worms	300	
	Roundworms	500	
	Annelid worms	200	
	Mollusks	155	6
	Arthropods	15 999	473
	Total	**17 154**	**479**
	Vertebrates		
	Fish	39	3
	Amphibians	7	
	Reptiles	53	6
	Birds	357	1
	Mammals	93	6
	Total	**549**	**16**
TOTAL		**17703**	**495**
Plants	**Lower plants**		
	Algae	428	
	Lichens	464	
	Higher plants		
	Mosses	399	
	Vascular plants	3800	142
TOTAL		**5091**	**142**

2) Flora of the Republic of Armenia

a)Flora

At present the flora of Armenia is represented by about 3800 species of vascular plants belonging to 160 families and 913 genera. During 2007-2009 the analyses of large-scale floristic studies were done in the frames of the project “Revision of the Red Book of Armenia”. In the course of the project two volumes of the Red Book of Armenia were prepared in Armenian and English languages based on existing data and new field surveys. In the Red Book of Plants of Armenia 452 species of vascular plants (11,89% of the flora of Armenia) and 40 species of fungi (1,05% of the biota of Armenia) are registered. The categories of the registered species were defined by the criteria of International Union

for Conservation of Nature (IUCN). They are as follows: Critically Endangered (CR) - 143 species, Endangered (EN) - 249 species, andVulnerable (VU) - 60 species. In addition, the Red Book of Plants includes information on the species belonging to the other categories: Near Threatened (NT) – 21 species, Data Deficiency (DD) – 96 species, and Least Concern (LC) – 106 species.The Red Book of Plants of Armenia includes the following categories of macrofungi:Extinct (EX) – 1 species, Critically Endangered (CR) – 6 species, Endangered (EN) – 15 species, Vulnerable (VU) – 12 species, Near Threatened (NT) – 2 species, and Data Deficiency – 4 species. Five of the mentioned fungi are included in the European Red List of Fungi. In addition, the maps of 10 fungi species identified in Armenia are presented on the map of threatened fungi of Europe. Distribution of the species registered in the Red Book of Armenia by the regions of Armenia is as follows: Aragatsotn Region – 42, Ararat Region – 137, ArmavirRegion – 26, GegharkunikRegion – 39, LoriRegion – 47, KotaykRegion – 60, ShirakRegion – 38, Syunik Region – 186, VayotsDzor Region – 98, Tavush Region – 52.In 2010 the international project "Coordination and Development of Plant Red List AssessPrments for the Caucasus Biodiversity Hotspot" (CEFP) was finalized. In the result, 375 endemic species of the Caucasus Ecoregion including 109 species from Armenia were included in the IUCN's Red List database.

b)Vegetation

Origination, development and phyto-geographical distribution of the types of vegetation in Armenia are conditioned by the mountainous relief of the country, vertical zonation, climatic conditions and location of Armenia in the intersection of different floristic provinces. The vegetation is notable for diversity of plant communities, rich species composition and high level of endemism. The main types of vegetation are presented in Table 2 below.

Table 2. Main types of vegetation in the Republic of Armenia

N	Type of vegetation	Characteristics
1	Semideserts and deserts	The semidesert and desert vegetation of Armenia is located on the altitudes of 400-1250 m above sea level and occupies about 4550 km^2. About 80-90% of the occupied territory is used for agricultural purposes. In the Araks River nearby areas in some places there are accumulations of sand and on the low-land saline lands the saline deserts have been formed. The most interesting part of the sand desert is the *Calligonum* desert, which is the only site in the Lesser Caucasus with the presence of *Calligonum* communities. The area is included in the territory of Goravan Sands State Sanctuary. Semidesert ecosystems with the total area of 623.14 ha are protected in Erebuni and Khosrov Forest State Reseres, Arevik National Park, VordanKarmir and Goravan Sands State Sancuaries, which makes 0.2% of the total territory of SPNAs.
2	Steppes and meadow-steppes	The steppes and meadow-steppes are located on the altitudes of 1200-1500 m above sea level and occupy about 8000 km^2. Unlike the large and homogenous plateau steppes the mountainous steppes of Armenia are very diverse and distinguished by diversity of plant communities and richness of species composition. The typical peculiarity of steppe vegetation in Armenia is the presence of xerophilous grasses belonging to *Poaceae* family, which form thick sod, and thorny pillow-like motley plants. About 1600 species of high vascular plants occur in these communities; out of them 46 are endemics. Steppe

		ecosystems are protected in a number of SPNAs, including Khosrov Forest State Reserve, Sevan, Dilijan, Arpi Lake and Arevik National Parks and a number of State Sanctuaries on the total territory of 61 391.7 ha, which makes 15.8% of the total territory of SPNAs.
3	Arid open woodlands	Arid open woodlands are one of the oldest types of vegetation represented both by coniferous (juniper woodlands) and deciduous species (*Pistaciamutica*, *Aceribericum*, *Celtisglabrata*, *Pyrussalicifolia*, *Amygdalusfenzliana*and others) and shibliak. They are located on the altitudes of 600-2200 m above sea level and occupy about 2000 km^2. In total about 900 species of higher plants occur in these communities, out of them 35 are endemics. Arid open woodlands are protected in a number of SPNAs, including Khosrov Forest State Reserve, Sevan, Dilijan and Arevik National Parks, as well as Her-Her Open Woodland and Juniper Open Woodland State Sanctuaries.
4	Forests	Forests are located on the altitudes of 550-2400 m above sea level and occupy about 3340 km^2. In general, forest communities in Armenia are distributed on foothills and in the lower and middle mountainous zones at the mountainous slopes with inclination of $20\text{-}25^0$. The lower timberline in Northern Armenia (Tavush Region) is on the altitude of 500 m, the upper timberline reaches up to 2300-2400 m, though separate trees occur above the upper timberline on higher altitudes. Forest biodiversity of Armenia is represented by valuable species of trees (125 species), shrubs (111), small shrubs (30), semishrubs (48) and woody lians (9). The oak and beech forests are of the highest productivity, they are located on the altitude of 1300-1600 m above sea level. About 870 species of higher plants occur in forest communities, out of them 23 are endemics. Forests in Armenia are protected in a number of SPNAs, including Khosrov Forest and Shikahogh State Reserves, Dilijan, Sevan and Arevik National Parks and about 13 state sanctuaries, where forest landscapes occupy 110 269.2ha, which makes 28.5 % of the total territory of SPNAs.
5	Sub-alpine and alpine meadows	Sub-alpine and alpine meadows are located on the altitudes of 2200-4000 m above sea level and occupy about 4000 km^2. These are ecosystems typical for upland zones of Armenia. About 1100 species of higher plants occur in these ecosystems, out of them 24 are endemics. In the system of SPNAs the sub-alpine and alpine meadows occupy 87 516.24 ha, which makes 22.6 % of the total territory of SPNAs. They are represented in Arpi Lake and Arevik National Parks, Zangezur, Khustup, Aragats Alpine, Sev Lich and Jermuk Hydrological State Reserves.
6	Wetland vegetation	Wetland vegetation can be found in all zones, it occupies the territory of about 1774 km^2. These diverse ecosystems are located in lakes, rivers, streamlets and marsh areas, which vary dependent on environmental conditions and elevations. In total 630 species of plants occur in these communities, out of them 3 are endemics.

7	Petrophilous vegetation	Petrophilous vegetation also occurs in all vertical zones and occupies the territory of about 800 km^2. It can be found on rocky and stony slopes. These communities are distinguished by rich diversity of species composition. More than 1100 species of plants occur, out of them 27 are endemics.

3) Fauna of Armenia

The diversity of fauna of Armenia is also notable for the richness of species composition. The results of studies implemented during the recent decade have shown that the process to clarify the species composition of vertebrate animals in Armenia can be considered finalized. However, the same cannot be said about invertebrate animals, which have been studied by about 30%. The fauna of Armenia is notable for high endemism with 495 endemic species (about 3% of the fauna) with the majority of invertebrates.During 2007-2009 the large-scale analyses of zoological studies were done in the frames of the project Revision of the Red Book of Armenia. In the result the Red Book of Animals of Armenia was prepared and published (2010), which includes 155 species of vertebrates and 153 species of invertebrates (Table 2).

Table 3. The species registered in the Red Book of Armenia (2010) and their status by IUCN criteria.

Status by IUCN criteria / Taxonomic group	Extinct (EX)	Regionally extinct (RE)	Critically endangered (CR)	Endangered (EN)	Vulnerable (VU)	Data deficiency (DD)	**Total**
Invertebrate animals (Invertebrata)							
Type Mollusca (Molluscs)							
Class Gastropoda (Gastropods)			11	3			**14**
Class Bivalvia (Bivalves)			2				**2**
Type Arthropoda (Arthropods)							
Class Insecta (Insects)	1		35	62	40	1	**139**
Sub-total	**1**		**48**	**65**	**40**	**1**	**155**
Vertebrate animals (Vertebrata)							
Class Osteichties (Fishes)	2 subspecies		2 subspecies	1	3	2	**7**
Class Amphibia (Amphibians)			1		1		**2**
Class Reptilia (Reptiles)			7	2	10		**19**
Class Aves (Birds)				18	65	13	**96**
Class Mammalia (Mammals)		3	3	10	12	1	**29**
Sub-total		3	11	31	91	16	**153**
Total	**2**	**5**	**59**	**96**	**131**	**16**	**308**

Table 4.Distribution of the RA Red Book registered species by regions of Armenia.

RA regions	Invertebrate species	Vertebrate species	Total
Aragatsotn	22	38	60
Ararat	51	92	143
Armavir	15	52	67
Gegharkunik	30	74	104
Lori	7	47	54

Kotayk	62	28	90
Shirak	12	44	56
Syuik	57	65	122
VayotsDzor	29	49	78
Tavush	18	42	60

As it was already mentioned the mountainous relief is the decisive factor for the richness of biodiversity of Armenia and its distribution; it has also significant impact on distribution of fauna species by altitudinal zones. In this respect, the main peculiarities are as follows.

1. ***Semidesert zone.***In semidesert terrestrial ecosystems of Armenia 101 species of vertebrate animals (4 amphibians, 30 reptiles, 23 birds, 44 mammals) and 1687 species of invertebrates (including 59 molluscs, 97 arachnids and 1531 insects) have been registered. Some reptiles are typical for the limited desert areas. Numerous endemic invertebrate species occur in semideserts, including those of mediterranean, iranian, caucasian and crimean origin. The existence of an endemic species *Porphirophorahamelii* is linked to the saline halophillic communities. The semidesert landscape located in the south-west of Armavir Region in the Araks River valley is of high interest. This unique landscape has not been well studied. Due to geographical conditions of the area a number of rare, threatened and endemic species of the fauna of Armenia have been preserved here, which almost do not occur in any other landscape. Many out of 51 species of reptiles of Armenia occur in the Ararat Valley including Armavir Region.
2. ***Steppe zone.*** In Armenia 96 species of vertebrates (4 amphibians, 32 reptiles, 19 birds, 41 mammals) and 992 species of invertebrates (81 molluscs, 126 arachnids and 785 insects) have been registered as typical for the steppes. The steppe invertebrate fauna is younger by origin and relatively less diverse.
3. ***Forest zone.*** According to the data clarified during the recent years 90 species of vertebrates (6 amphibians, 25 reptiles, 42 birds, 17 mammals) and 2212 species of invertebrates (95 molluscs, 85 arachnids and 2032 insects) have been registered as typical forest species. Forest ecosystems are notable for the highest species diversity of invertebrate animals.
4. ***Sub-alpine and alpine meadow zone.***The fauna of this zone includes 58 species of vertebrates (3 amphibians, 10 reptiles, 12 birds and 33 mammals) and 508 species of invertebrates (49 molluscs, 12 arachnids and 447 insect).
5. ***Wetland ecosystems.*** In the fauna of wetland ecosystems in total 255 species of vertebrate animals (7 amphibians, 5 reptiles, 213 birds and 30 mammals) and 786 species of invertebrates (50 molluscs, 12 arachnids and 724 insect) have been registered. The wetlands of the Ararat valley are the habitats and nesting areas for more than 200 species of birds. The fish farms of Armash are the only nesting area in Armenia for the species *Oxyuraleucocephala*and*Marmoronettaangustirostris* included in the IUCN Red List.

14. Importance of biodiversity for the Republic of Armenia

1)The well-being of Armenia's population is greatly dependent on availability of biological resources, which are the strategic resources for the country, equally to underground resources. In this respect the rich biodiversity of Armenia with high capacities to ensure stability of ecosystems is a precondition for economic development of the country. The sub-sectors of agriculture, such as crop cultivation, live-stock breeding, bee-keeping and fish farming as well as a number of important sub-sectors of the light and food industry depend on the representatives of useful wild plants and endemic

animal species. Biodiversity has invaluable role in maintenance of qualitative and quantitative features of ecosystem services (ES), especially when it comes to protection of the genetic pool of cultivated plants and domestic animals, breeding, production of medicines and new substances through biotechnologies. The useful species of flora and macrofungi of Armenia, which are used as food are represented by the following groups:

a) Edible plants – about 200 species;
b) Wild fruits and berries – about 120 species (about 40% of dendroflora of Armenia);
c) Honey plants – about 350 species; and
d) Edible mushrooms – 290 species.

2) The fauna of Armenia is also rich in species which have been traditionalyused as food including fish (Sevan trout (ishkhan), Sevan khramicarp, Sevan barbel,river trout, catfish, Araxnase, carp, crucian carp and others), crawfish, birds (quail, chukar, various species of ducks and doves and others) and many species of mammals (wild boar, roe-deer, bezoar goat, Armenian mouflon and others).

3) The wood from forests is used as fuel-wood and construction wood. The wood of oak, beech and hornbeam is highly valued. The construction wood makes 8-11% of the annually logged total volume of wood.

4) Medicinal plants make about 10 percent of the species composition of the flora of Armenia. It has been proven, that the useful properties of wild medicinal plants growing in mountainous regions are obviously higher, due to which their collection is increasing every year. About 15 species are used for production of refreshing and medicinal teas, which are of high demand both in Armenia and other countries. 122 species of macrofungi growing in Armenia also have pharmacological properties. In the list of fauna representatives the excrements of Chiroptera species, fat of badger and venom of poisonous snakes (Armenian viper, Lebetina viper) are used for medicinal purposes to treat epilepsy, hemophilia, cancer and bronchial asthma and others diseases.

5) There are more than 2000 species of fodder plants. The ether-bearing plants are represented by about 150 species and dye plants - by about 120 species. It is notable that an endemic insect *Porphyrophorahammelii* as a source of resistant and unique dye carmine has been used for centuries in Armenia. Numerous plants with vitamin, tannin and rubber producing properties also have economic significance.

6) The wild relatives of a large number of cultivated plants (cereals, fruity tree species and others) identified in the Republic of Armenia is a specific source of genetic material. At present the territory of Armenia belongs to the Southwest Asian center of origin of cultivated plants (soft and hard wheat, pea, lentil and grape). The rich genetic pool of wild relatives of cultivated plants is used for getting new varieties of plants resistant to drought and cold as well as having high adaptability. Three out of four species of wild wheat known in the world grow in Armenia: *Triticumboeoticum*Boiss.,*T.urartu*Thum. exGandil.) and*T. araraticum*Jakubz. The last two species were first identified in Armenia.In Armenia there are numerous wild species of cultivated leguminous plants as well as wild relatives of vegetables (280 species), oil-bearing and medicinal plants and spicy herbs. Among fruits and berries about 30 species of wild relatives occur on the territory of Armenia.

15. The factors having impact on the status of biodiversity in Armenia and its trends

1) Forty four percent of the territory of Armenia is a high mountainous area. The degree of land use is strongly unproportional. The zones under intensive development make 18.2% of the territory of Armenia with concentration of 87.7% of total population. On these areas the population density

exceeds several times the ecological threshold index (200 person/km^2) reaching up to 480-558 person/km^2. The poorly developed zones make 38.0% of the territory, where only 12.3% of total population resides with a very low density of 11-20 person/km^2.

2) Due to intensive nature use the level of anthropogenic changes of natural landscapes in Armenia is high. More than 60% of the territory is under active agriculture, in semidesert and mountainous steppe zones the figure reaches up to 80-90%. Overexploitation has resulted in reduction and pollution of the territories covered by wild biodiversity, loss of habitats of certain species and changes in the services provided by ecosystems. The natural factors, which are risky for ecosystems and their components, are also mainly conditioned by unconscientious approaches of human towards nature. In the early post-soviet period this was connected with the hard socio-economic conditions, energetic crisis and poverty of wide classes of population in the country. Over the recent years the negative impact on biodiversity and increased rates of ecosystem degradation have been conditioned by certain intensification of economic and social activities, which is expressed in overuse of biological resources, exploitation of mines, expansion of areas under construction, visible activation of agriculture and tourism development. Basically almost all threats of the hierarchical classification of threats suggested by IUCN have some impact on biodiversity of Armenia. Almost no comprehensive analysis and assessment of all of these threats have been done in Armenia. These threats include loss of biodiversity habitats, overexploitation of biological resources, environmental pollution, introduction of invasive species and climate change.

3) Loss of habitats is conditioned by open mining, constructions, agricultural practices, loggings, development of hydropower production sector, recreation and tourism.

a) Mining industry. Thousands of hectares of the territory of Armenia are covered by open mines and tailings ponds. According to the RA land balance in 2011 the lands of industrial, underground resource exploitation and other production purposes made 33.0 thousand ha, in 2012 – 33.6 thousand ha, in 2013 - 34.9 thousand ha and in 2014 - 36.4 thousand ha, which means that the area of used territories is gradually increasing especially at the expense of the lands under exploitation of mineral resources. The main geoecological implications of the mining industry include disturbance of soil cover, expansion of tailings ponds and accumulation of waste, which cause fragmentation of populations and communities of plants and animals on thousands hectars, disturb migration routes of animals and threaten the existence of some rare species. Open mining in forest areas is of the greatest concern, with implementation of the works on deforestation, construction of tailings ponds, establishment of new infrastructures and others.**b) Construction**. Due to reduction of the total volume of construction works during 2010-2014 at present the risk of their impact on ecosystems is not high. The most significant damage is caused by establishment of irregular roads in the areas, where the works on geological exploration are implemented and installation of respective technical means requires establishment of a dense road network. At the same time usually the previous state of the landscape is not recovered after completion of the exploration works.

c) Agriculture. In the field of agriculture the problems connected with the environment include losses of water due to ineffective irrigation as well as salination of soils, erosion and pollution by agricultural wastes. At present about 33% or 150 thousand ha of arable lands is not used for the target purpose. This threatens wild biodiversity as the abandoned cultivated areas get covered by aggressive weeds and become the centers of their reproduction. For the natural ecosystems being used as pastures the biggest threat is the unproportional distribution of the pasture load, when the distant pastures suffer from under-grazing. This results in change of ecosystems, in particular replacement of alpine carpets with alpine meadows as well as active penetration of sub-alpine weeds into alpine ecosystems. At present, the activation of water erosion and expansion of marsh areas is observed in

natural pastures. Water use for development of agriculture and energy production sector often causes drying of river courses, which result in elimination of littoral and water ecosystems, especially fish species and the species they feed on. The works on cleaning and change of water courses are often not justified and result in elimination of river biotopes including food base for fish and their spawning grounds.

d) Loggings. In deforested areas the negative changes of ecological situation are of the long-term nature. Due to various socio-economic problems and high demand for wood the rate of forest loggings still exceeds the rates of natural regeneration of forests. The accessibility of wood, increasing prices of power-bearing substances and low solvency of socially insecure population contribute to that. Loggings result in intensive unfavorable changes of forest composition, such as reduction of tree density, replacement of economically high value oak and beech by low value hornbeam, elimination of species (including Red Book listed ones) in the lower forest zone. The areas of forests of seed origin have been reduced and instead the proportion of coppices and secondary tree and bush species has increased. Over the recent years in the logged forest areas and adjacent territories the increase of wind-fallen or snow-fallen areas, activation of soil erosion, landslides, avalanches, drying of springs, formation of dust clouds and other processes have been observed, which cause serious damage to communities and areas of agricultural significance. As a consequence of changes of the forest ecosystem qualitative features the mass outbreaks of pests can be observed. The cases of forest fires have increased. The complex relief, poor condition of forest roads, absence of respective technical equipment for fire control and others cause obstacles for implementation of effective fire control measures.

e) Hydropower production. In Armenia the construction of small hydropower plants (SHPP) is considered a leading direction in development of the renewable energy sector. Construction of SHPPs is done according to the SHPP development scheme. As of January 1, 2014 the licenses for hydropower production were issued by the RA Committee on Regulation of Public Services to 150 SHPPs. The studies implemented in recent years have analyzed the impact of SHPPs on water regime of a number of rivers, loss of biodiversity, natural calamities, tourism development as well as socio-economic condition of communities. It has been revealed, that the planning and exploitation of SHPPs basically do not consider the needs of water fauna, at the same time the impact of changes of water regime of the mountainous rivers on the littoral and water ecosystems has never been studied. The SHPPs constructed on the rivers, which serve as spawning grounds for fish, basically do not have appropriate fish passes and fish protection constructions and directly threaten the existence of mature individuals of fish species, which move up by rivers to get to their spawning grounds. Besides, some SHPPs do not observe the rates of maximum allowable water use, which also results in ecosystem degradation.

f) Recreation and tourism. The impact of recreation and tourism on ecosystems is mainly connected with recreational trampling of plant cover. Pollution of picnic sites with domestic waste also causes problems, especially if such sites are not adjusted for recreation with provision of respective services. Collection of decorative flowers especially in recreational areas is risky for reduction of the resources of some plant species and for change of species composition of flora in these areas.

g) Overuse of biological resources. The main consequences of overuse of biological resources include increasing anthropogenic impact on natural landscapes, disturbance and degradation of forest, semidesert, meadow and steppe ecosystems, disturbance of terrestrial and water communities and populations, change of their species composition, disturbance of plant cover in pastures, reduction of productivity of fodder plants, reduction of economically valuable species as well as rare species and those under the threat of extinction. The threats include also poaching and violation of hunting

regulations. The lack of a comprehensive information database on biodiversity in its turn excludes actual assessment of the impact of anthropogenic and natural factors on biodiversity, estimation of the caused damage and most importantly decision-making based on accurate information. The stock-taking, inventory and monitoring as the main necessary elements of effective bioresource management are still not implemented at appropriate level and scale.

h) Environmental pollution. Accumulation of hazardous chemical substances in soil, pollution of underground waters and rivers, accumulation of industrial wastes and landscape degradation result in disturbed conditions for species growth, development and reproduction, eliminate valuable, threatened and rare species in forest ecosystems, as well as cause decline in productivity of agrocenoses and worsening of the yield quality. At present the main threat of pollution is caused by production, accumulation and storage of the wastes from the mining industry. At present on the territory of Armenia there are 19 tailings ponds with about 220 million m^3 of accumulated substances. The cement producing industry also has a negative impact. Due to imperfect technical equipment the cement dust is emitted into air, which affects natural ecosystems and their components by changing soil conditions as well as causing impacts on invertebrate fauna and photosynthetic activity of plants. Surface watercourses and landscapes are polluted also by solid domestic wastes. The main threat in agriculture is the excessive use of fertilizers and pesticides. At the same time, often the expired substances are used and in more quantities for higher productivity, which cause serious threat to human health through agricultural products. The official data on this process in recent years have been missing.

i) Impact of alien species. The analysis of dissemination of invasive and expansive plant species of Armenia shows that in recent years some of them have considerably widened the limits of their distribution (probably connected with the change of climatic conditions and expansion of degraded habitats). The density of their populations has increased with their penetration and establishment in natural ecosystems. Over the recent years the general assessment of distribution of invasive and expansive species has been done. In the result, 77 alien invasive and locally expansive species have been listed, which at present are disseminating in degraded habitats and have already penetrated natural ecosystems with causing threats to wild biodiversity.

j) Climate change. According to the analyses implemented in the frames of the project "Enabling Activities for the Preparation of Armenia's Second National Communication to the UN Framework Convention on Climate Change" (2010) in the result of the climate change it is expected to observe expansion of the arid ecosystems, reduction of the areas covered by forests and sub-alpine and alpine landscapes and increased vulnerability of forests.Ecologically most unstable forests on southern slopes will become more xerophilous and arid open woodlands will shift vertically up. In the lower timberline it is expected to have worsened conditions for seed regeneration of forests along with penetration of semidesert species as well as shift of the lower timberline up. In the lower forest zone of the central and southern Armenia an impact of the mountainous-steppe vegetation will be observed and the stands of coppiced origin will retreat. The expansion of the arid ecosystems with high surface flow will result in intensification of erosion and mudflow processes and flow of forest soils, worsening of the qualitative and quantitative characteristics of the surface flow and disturbance of the water balance. The activation of erosion processes due to aridization in the absence of preventive measures in its turn will result in the worsening of forest growth conditions and reduction of forest cover in the lower forest zone and the forests on southern slopes in the central and southern Armenia. Besides, the risk of climate change is high for the mesophilous species of the steppes, meadow-steppes and meadows. Due to the climate change their very limited populations with isolated habitats will become accessible. The climate change, in particular increase of water temperature can bring to the thermal stress of hydrobionts and disruption of physiological processes and change of the

behavior of organisms. The climate change results also in the warming of the bottom cold water layers, due to which during summer months the optimal area for existence of the fish species adapted to cold waters is severely reduced.

16. The impactofbiodiversitychanges on ecosystemservicesandtheirsocio-economicandculturalconsequences

1) Ecosystems are the basis for human well-being and economic development of the country. They ensure food, clean air and water and other needs. Considering the scale of anthropogenic impact on nature in Armenia, maintenance and restoration of ESs should become an important component of economic activity, which requires changes of the norms and rules of economic behavior and political decision-making. At the same time even partial recovery of ecosystems and their services is usually much more expensive than implementation of the measures aimed at their protection. According to international classification the services provided by ecosystems are classified as provisioning, regulating, cultural and supporting services.

2) Maintenance of ESs and long-term use of biodiversity imply application of the ecosystem approach in integrated management of natural resources. To date in Armenia the needs of natural resource management have not been fully integrated in the sectoral policies. The main reason is the lack of assessment of provisioning services provided by natural ecosystems and their monetary evaluation. Consequently, it is important to evaluate natural resources and ESs as well as to integrate the costs of biodiversity maintenance and restoration in the economic development policy and strategy of the country.Underestimation of biodiversity and ecosystem services in the Republic of Armenia is related to a number of problems such as:

a. Low awareness of wide public, users of ecosystem services and decision-makers, who are either absolutely ignorant about the services provided by ecosystems or perceive ecosystem services only as the resources available in ecosystems.
b. The benefits coming from the services provided by various ecosystems have not been valuated yet and integrated in market relations.
c. The value of ecosystem services very often is not considered during economic assessments and decision-making as well as it is not reflected in economic indicators of the country.
d. The legislation on ecosystem services is not appropriate.

3) In 2013 the first attempt on legal establishment of main provisions of the ES concepts was done through adoption of the Concept on Establishment of Innovatory Financial-Economic Mechanisms in Environmental Sector (protocol decision N16 by the RA Government dated 25 April 2013). The aim of the concept is to solve the issues of underestimation of biodiversity and ecosystems in Armenia, mitigate the negative impacts on environment and ensure sustainable use of natural resources as well as to increase environmental investments and financial resources. The concept emphasizes the issues of awareness about ESs, development of market relations, economic valuations, decision-making as well as integration of ESs in national economy. The proposals of the concept are aimed at regulation of legislative relations connected with ESs, economic valuation of natural capital and development of a methodology on economic or monetary valuation of ESs. In particular, it is suggested to introduce a system on payments for ecosystem services, which in practice will not replace the system of environmental and nature use fees, but will be applied in parallel with it.

IV. Legal and institutional frameworks related to biodiversity of the Republic of Armenia

17. The legislation of the Republic of Armenia includes the following legal acts related to biodiversity:

1. **International conventions ratified by the Republic of Armenia:**
   a. UN Convention on Biological Diversity (Rio de Janeiro, 1992)
   b. Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979)
   c. European Landscape Convention (Florence, 2000)
   d. Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)
   e. Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, 1979)
   f. Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 1971)
   g. UN Convention to Combat Desertification (Paris, 1994)
   h. UN Framework Convention on Climate Change (New York, 1992)
   i. Convention on Environmental Impact Assessment in a Transboudary Context (Espoo, 1991)
   j. UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus, 1998)
2. **Legal Acts of the Republic of Armenia including:**
   a. 7 codes of the Republic of Armenia
   b. About 14 laws of the Republic of Armenia
   c. More than 30 governmental decisions of the Republic of Armenia

18. Institutional framework

1) The biodiversity of the Republic of Armenia is managed in the frames of the competences of authorized bodies as stipulated by the RA Law on Flora, RA Law on Fauna, RA Law on Specially Protected Nature Areas and RA Forest Code. At present according to respective decisions of the RA Government the authorized bodies are represented by the RA Ministry of Nature Protection and the RA Ministry of Agriculture, in particular:

a) The Division on Biodiversity Policy and the Bioresources Management Agency under the RA Ministry of Nature Protection,and is vested with the function of biodiversity management.

b) The Division of Plant Growing and Plant Protection and the Department on Forestry under the RA Ministry of Agriculture is vested with the function of biodiversity management.

2) In the biodiversity related institutional framework the state non-commercial organizations (SNCO) responsible for protection of SPNAs and forest areas have an important role. The peculiarities of SPNA management are described in detail in the Strategy and State Program of Conservation and Use of Specially Protected Nature Areas of the Republic of Armenia.

3) *Ex-situ* management (out of natural habitats) of biodiversity is implemented by the Scientific Center of Farming SNCO and Scientific Center of Vegetables and Industrial Crops SNCO under the RA Ministry of Agriculture and the Gyumri Breeding Station SNCO as well as by the Institute of Botany SNCO under the RA National Academy of Sciences and the Laboratory of Plant Gene Pool and Breeding of the Armenian National Agrarian University.

V. Strategy on biodiversity conservation anduse

19. Strategic Plan 2011-2020 of the Convention

1) The Strategic Plan 2011-2020 is aimed at taking effective and urgent actions to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. The cornerstone of the Plan is the provision that biodiversity is a basis for ecosystem functioning and human well-being. Biodiversity provides for food security and human health, it ensures clean air and water as well as economic development of countries. The plan stipulates general framework for biodiversity conservation and sustainable use, which includes the following five main goals:

a) Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
b) Reduce the direct pressures on biodiversity and promote sustainable use
c) Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
d) Enhance the benefits to all from biodiversity and ecosystem services
e) Enhance biodiversity conservation and use through participatory planning, knowledge management and capacity building

2) These strategic goals are addressed in detail in twenty Aichi Targets (see the Fifth National Report of Armenia to the Convention on Biological Diversity), which include the principles and measures to be taken to prevent biodiversity loss. They need to be reflected in national strategies and plans. At the same time it is necessary to integrate biodiversity conservation and sustainable use principles in respective sectoral and inter-sectoral plans, programs and policies.

20. Interrelation of the Strategic Plan of the Convention and Aichi Targets with the targets of other environmental conventions

1) Besides the Convention, there are a number of other international treaties aimed at biodiversity conservation.

2) The main goals of the UN Framework Convention on Climate Change, the Convention on Biological Diversity and the Convention on Desertification by their nature have common features, which is clearly reflected in the provisions of the Strategic Plan of the Convention on Biological Diversity and in a number of Aichi Targets aimed at mitigation of global climate change and land degradation. It is proven that the amount of greenhouse gases emitted in the atmosphere is continuously increasing and green areas are reduced due to human actions, which contribute to global climate warming resulting in the increased negative impact of the climate on biological diversity. It results in reduction of populations and species, changes in species distribution, increased mass outbreaks of pests and diseases, disturbed balance of competing species, distribution of invasive species and pathogen organisms and others. Such diverse changes have deep impacts on qualitative and quantitative features of natural resources as well as on health of population.

In arid and semiarid areas the maintenance of ecosystem services greatly depends on plant cover and its physical structure. Good condition and diversity of plant cover contribute to soil formation and protection as well as regulate surface flow of waters, local climate and water absorbtion by soil. Disturbed interrelation of ecosystem services is one of the crucial factors of desertification in arid and semi-arid areas. This happens when long-term economic use of natural resources is ecologically unsustainable and does not match the potential capacities of natural landscapes and ecosystems to

ensure appropriate ecological conditions. The above-mentioned allows to have a complex approach towards tackling synergic problems under the Rio three global environmental conventions.

3) The Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979) is an important treaty in the field of biodiversity conservation, which was ratified by Armenia in 2008. The main aim of the Convention is to conserve wild flora and fauna and their natural habitats through cooperation of several states and promotion of such cooperation. The aim of the Emerald Network is to create an ecological network for the entire European region through designation of the areas having special environmental interest and special protection regimes in order to mitigate the threats for wild flora and fauna species.

4) The geographical scope of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979) is wider. The Parties to the Convention acknowledge the importance of migratory species and take necessary steps to conserve such species and their habitats. The provisions of the Convention refer to those migratory species, for which there are reliable and scientifically justified data on their endangered status and insufficient conservation. The Convention emphasizes that wild animals are an irreplaceable part of the earth's natural system and each generation should conserve biodiversity to ensure wise use of this legacy for human well-being.

5) Armenia joined the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (Ramsar, 1971) in 1993. The main aim of the Convention is the conservation and wise use of all wetlands through local and national actions and international cooperation. According to the criteria defined by the Convention each Party to the Convention should designate suitable wetlands, so called Ramsar sites for the list of Wetlands of International Importance. These sites should have important economic, recreational and cultural significance and provide various ecosystem services such as regulation of water regime, provision of habitats for existence of flora and fauna representatives, regulation of climate and carbon sequestration and retention.

6) The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, Washington, 1979) is aimed at control of international trade of some biodiversity representatives through legal regulation of the import, export and introduction of endangered, critical and threatened species. A system of permits and certificates is applied to avoid the use of such species, which can be detrimental to their survival.

21. The goal and directions of the Strategy of the Republic of Armenia on Biodiversity Conservation andUse

1) The main goal of the Strategy of the Republic of Armenia on Biodiversity Conservation, Use and Reproduction is to prevent the loss of biodiversity and degradation of natural habitats through conservation and sustainable use of biodiversity and ecosystems to ensure their diversity and human well-being.Based on this goal and the goals of the Strategic Plan and Aichi targets the following directions of the strategy of the Republic of Armenia on biodiversity conservation and use have been formulated:

a) Improvement of legislative and institutional frameworks related to biodiversity.
b) Enhancement of biodiversity and ecosystem conservation and restoration of degraded habitats.
c) Reduction of the direct pressures on biodiversity and promotion of sustainable use.
d) Elimination of the main causes of biodiversity loss through regulation of intersectoral relations and public awareness raising.
e) Enhancement of scientific research, knowledge management and capacity building in the field of biodiversity conservation and sustainable use of natural resources.

2) At the same time national targets were defined, which are in line with the the strategic directions and based on national peculiarities.

22. Improvement of legislative and institutional frameworks related to biodiversity

1) The national targets related to the strategic direction on improvement of biodiversity legislation and institutional frameworks are as follows:

a) To stipulate by legislation the mechanism of monetary valuation of biodiversity and ecosystem services.
b) To stipulate by legislation the mechanisms for assessment of biological resources and determination of their quotas subject to use, improve the system of bioresources management.
c) To ensure accessibility of data on genetic resources.

2) The need to achieve the mentioned targets is conditioned by the following considerations:

a) The ecosystems of the Republic of Armenia have crucial functions to ensure ecological security and regulate climate as well as toensure sustainable economic development, health and improvement of the standards of living of population. Considering the multi-functional and irreplaceable role of biodiversity and ecosystems of Armenia in human well-being, the understanding of the need for monetary valuation of biodiversity and ESs at all levels is the priority and necessary condition for sustainable country development. To date the values of biodiversity and ecosystem services have not been considered in decision-making processes and have not been reflected in the plans of socio-economic development of the country and its regions. In order to integrate the values of biodiversity and ecosystem services in the national and local strategies and plans on development and poverty reduction, it is necessary to have their appropriate evaluation and strengthen cooperation between various stakeholders and the Government. Given the country capacities, the monetary evaluation of biodiversity and ecosystem services can be done step by step to start with the values, which are easy to evaluate and then to proceed to the others. To date in Armenia evaluationof the main good provision services have been regulated only for forests and pastures. However, these services are considered not as the benefits provided by ecosystems, but as the outcome of production and agricultural activity. Consequently the protection of ecosystems and their components is not at appropriate level. For example, sustainable forest management implies maintenance of the whole range of forest ecosystem services and to some extent it is reflected in forest management plans of forest enterprises. However, no special actions are taken to protect the areas with rich biodiversity, rare and endangered species and the areas providing essential services for nature and human survival – the areas, which should not be subject to any type of loggings. In order to develop realistic pasture management plans first of all it is necessary to make their inventory to assess their productivity and severety of erosion, create the cadaster of pastures of Armenia and based on these data determine the optimal scale and terms of their use as well as the measures necessary for their improvement. The management plans should consider the need for biodiversity conservation as well as the natural processes of accumulation of humus, which ensures carbon sequestration. To date in Armenia no comprehensive economic assessment of biodiversity has been done and monetary assessment of ecosystem services and biodiversity has not been considered in the plans of socio-economic development. There are only the methods for assessment of penalties for elimination of individual species of animals and plants.
b) At present in Armenia the traditional marketing system cannot adequately assess biological resources and their value is underestimated or not estimated at all. It is known that the value of entire biodiversity in natural ecosystems is much higher than the values of plants or animals, which are the components of ecosystems. Their value is usually calculated by their

cost as hunting objects or by environmental penalty for their destruction. This problem is most visible in relation to water ecosystems, especiallyin terms of commercial use of fish resources and crawfish in Lake Sevan. Upon having defined quotas it will be necessary also to revise the order on issuing licences. Development and implementation of measures aimed at improvement of the state of forests for production purposes is not sufficient in terms of conservation of forest biodiversity. Forest management plans should consider forests with high conservation values as well as economically valuable and "mature" forests, which ensure respective conditions for survival of numerous representatives of forest biodiversity. In this respect, it is necessary to revise forest management plans as well as consider the presence of forests with high conservation values when establishing new SPNAs.

c) In order to regulate accessibility of genetic resources and ensure fair and equitable sharing of benefits arising from their utilization it is necessary to have respective legislation, human and technical resources as well as institutional structures. In this respect it was important that in 2007 Armenia joined the International Treaty on Plant Genetic Resources for Food and Agriculture, by which the country made commitments to promote accessibility of plant genetic resources as well as fair and equitable sharing of benefits arising from their utilization. In order to ensure accessibility of genetic resources it is important to have comprehensive information on genetic resources conserved at national level, as the accessions of seed collections serve as the objects for safeguarding accessibility and exchange. It enables the farmers to learn about new varieties and use them for intended target through acquisition of accessions with desired properties. At present the centralized database of plant genetic resources – the national catalogue is maintained and periodically updated by the National Genebank. However, it is not accessible to scientific institutions, institutions of higher education, farmers, NGOs and other stakeholder as it is not an internet based database.

23. Enhancement of biodiversity and ecosystem conservation and restoration of degraded habitats

1) The national targets related to the strategic direction on enhancement of biodiversity and ecosystem conservation and restoration of degraded habitatsare as follows:

a) To enhance conservation of biodiversity habitats with minimizing their degradation.
b) To enhance *in-situ* and *ex-situ* conservation of biodiversity

2) The need to achieve the mentioned targets is conditioned by the following considerations:

a) Changes of habitats including their degradation and fragmentation are the main causes of biodiversity loss. Degradation of ecosystems, which are the habitats of flora and fauna first of all is conditioned by unsustainable use of biological resources, industrial exploitation of natural resources and use of territories for mining and construction purposes, loggings, agricultural use of steppe areas, drying of marshlands, construction of reservoirs and small hydropower plants and others as well as unsustainable use of natural resources. The loss of natural habitats becomes very problematic for Armenia, which has a small territory and limited green areas. In order to reduce the loss of biodiversity habitats it is necessary to identify direct and indirect causes of loss as well as to assess the damage caused by the negative impact. It is necessary to develop complex mesures on restoration of degraded habitats. In addition, it is needed to pay appropriate attention to resilience of ecosystems. According to the data of the Report on the Global Forest Resources Assessment implemented by the UN Food and Agriculture Organization in 2010, the accumulated carbon stock in the biomass of the living forests of Armenia (above the ground and underground parts) makes 48 tons per ha. At the same time the carbon stock accumulated in the entire forest biomass in the

period of 1991-2010 reduced from 17 million tons to 13 million tons, which can be attributed to intensive loggings in Armenia over the mentioned period. Conservation and rehabilitation of wetlands in the basin of Lake Sevan and other regions of Armenia is also important for the increase of ecosystem resilience and increased contribution of biodiversity in carbon sequestration. At present it is important to study and assess potential capacities of ecosystems to sequestrate and accumulate carbon as well as to develop and implement a program on restoration of the most important ecosystems. It is necessary to make inventory of the state of the main ecosystems, identify priorities and develop an action plan. In order to reduce the threat of loss of flora and fauna species due to anthropogenic impact it is necessary to take actions aimed at tackling direct and indirect threats of loss. It is possible to prevent extinction of critical species through protection and restoration of their habitats, establishment of SPNAs and *ex-situ* conservation measures. Climate change is also a factor, which threatens ecosystems and their biodiversity. The state of ecosystems, which are the most vulnerable to climate change, was assessed in National Communications on Climate Change (1998, 2010 and 2015). However more studies need to be done. Additional field surveys and continuous monitoring are needed for the main ecosystems as well as populations of selected species of flora and fauna (rare, endangered, indicator, invasive and expansive species).

b) *In-situ* conservation of biodiversity first of all requires development of the system of SPNAs, for which there isthe political will and respective prerequisites in the country. They are reflected in the Strategy and State Program of Conservation and Use of Specially Protected Nature Areas of the Republic of Armenia adopted by the RA Government by decision N 1059-A dated 25 September 2014. It emphasizes the importance of having higher representation of the landscapes and the species registered in the Red Book of Armenia in the SPNAs, which requires implementation of detailed studies of the areas with rich biodiversity. It is necessary also to identify the possibilities of their integration in the system of SPNAs.

24. Reduction of the direct pressures on biodiversity and promotion of sustainable use

1) The national targets related to the strategic direction on reduction of the direct pressures on biodiversity and promotion of sustainable use are as follows:

a) To take necessary steps to reduce the direct pressures on biodiversity.
b) To set up incentive mechanisms for biodiversity conservation and sustainable use.
c) To enhance conservation of genetic diversity of wild relatives of cultivated plants and domestic aminals as well as of species having socio-economic and cultural values.

2) The need to achieve the mentioned targets is conditioned by the following considerations:

a) The current model of economic development in Armenia often results in increased degradation of ecosystems and biodiversity. The positive trends based at calculation of economic indicators (increase of gross domestic product and national income and others) often can be associated with the loss of biodiversity and escalation of social problems. In this respect, first it is necessary to prevent negative factors causing damage to biodiversity, including mining and road construction activities in ecologically vulnerable areas, illegal loggings, environmental pollution and others. Decline of ecosystems in Armenia is conditioned by direct degradation of specieshabitats as well as unsustable use of natural resources (soil, water, biological and underground resources). It results in fragmentation of habitats of populations and species.
b) It should be mentioned that some foundations have been established in the RA legislation for setting up incentive mechanisms to encourage biodiversity conservation and sustainable use. According to the RA Law on Law on Targeted Use of Environmental Fees Paid by the

Companies the allocations to communities for target use are additional funds, which can be used for certain environmental activities, including biodiversity and forest protection, protection and sustainable use of biological resources in SPNAs. Article 62 of the RA Law on Underground Resources (2011) stipulate cases for not paying underground resource use fees. Provision 4 of the article says that the underground resource users do not pay underground resource use fee in case the activity is connected with study and protection of unique geological formation and nature monuments. Article 33 of the Forest Code of the Republic of Armenia (2005) sets incentives for establishment of forests in non-forested areas and areas without natural regeneration, which are provided for free if the forest user plans to establish forest there at his own expenses. The area becomes the property of the forest user upon its transfer to the category of "forest". For practical application of the positive incentives, which contribute to biodiversity conservation and sutainable use it is necessary to develop and introduce legislative and economic mechanisms related to payments for provided ecosystem services.

c) *In-situ* conservation of genetic resources in SPNAs is considered as the most effective way of biodiversity conseration. Meanwhile, *ex-situ* conservation allows restoration of resources damaged or eliminated in the result of natural disasters or anthropogenic impact. In spite of the progress registered in the field of *ex-situ* conservation of genetic resources over the recent decade, the species and intraspecies diversity of Armenia still is not fully represented in the existing seed collections. They cannot ensure seed protection and their reproduction capacity at appropriate level due to insufficient technical, financial and human capacities. Therefore, it is necessary to take actions aimed at expansion of the existing *ex-situ* collections, their enrichment with new accessions and technical upgrading. Besides, it is needed to establish specialized collections aimed at protection of the entire intraspecies diversity of individual species. In parallel to development of agricultural cultivation and breeding, some local varieties-populations are being gradually excluded from cultivation. They have lower yield capacities compared to modern varieties. However thanks to high adaptability to local conditions, resilience and other biological features they can serve as a valuable primary material for breeding. In general, they are better adapted to local conditions and more resilient to local pests and diseases. It is necessary to take steps aimed at minimizing genetic leakage of local traditional varieties considering the importance of their diversity for breeding and their unique organoleptic features, which characterize the Armenian cuisine and culture connected with traditions.

25. Elimination of the main causes of biodiversity loss through regulation of intersectoral relations and public awareness raising

1) The national targets related to the strategic direction on elimination of the main causes of biodiversity loss through regulation of intersectoral relations and public awareness raising are as follows**:**

a) To take steps aimed at introduction of mechanisms in intersectoral relations, which will exclude disturbance of ecological stability due to use of natural resources.
b) To strenghen cooperation betwen state structures and civil society and to raise public awareness about biodiversity problems.

2) The need to achieve the mentioned targets is conditioned by the following considerations:

a) Unsustainable use of biological resources is conditioned by improper legal acts on setting up the norms and quotas of their use, insufficient control over use of biological resources,

insufficient stock-taking, inventory and monitoring as well as imperfect information system on biodiversity. It results in reduction of the volume and quantity of goods provided by ecosystems and increase of poverty, which urge the population to put additional pressure on natural ecosystems and their components. Given the above-mentioned circumstances, it is important to assess the status of flora and fauna species to know to what extent they are endangered as well as to reassess the status of species registered in the Red Book of Armenia with consideration of results of the measures aimed at their protection. For sustainable use of biological resources it is also important to establish cooperation between bioresource users and introduce modern principles of bioresource management in the policies of different sectors of economy as well as to broaden scientific research related to bioresources. It should be mentioned that the examples of coordinated work between various stakeholder structures are rather limited as maintenance of ecosystem services is not considered a priority by bioresource users. In 2014 the RA Government approved the Strategic Plan of Perspective Development of the RA in 2014-2025 (decision N442-N), which was developed with consideration of the developments attributed to the global financial-economic crisis and new realities. It is mentioned in the Plan that during 2009-2011 the developments in the environmental sector of Armenia were mainly in the frames of the priorities of sustainable development and in accordance with the Second National Environmental Action Plan. In future in parallel with the high rates of economic growth it is necessary to reduce environmental risks, in particular illegal loggings, overuse of water resources and risks of desertification. This Strategic Plan defines the frames of sectoral policies and stipulates the foundations for development of intersectoralrerlations. The concepts of green economy, which have been widely applied in many countries during the last decade, are based on ecosystem approach and consider the integrity of ecosystems as a priority.Application of these principles implies integration of environmental problems in development programs and strategies of various sectors of the country economy. Therefore, the policies of agricultural, industrial and energy sectors should be in line with the environmental policy. In this respect the presence of human potential with respective ecological thinking and culture as well as awareness of wide public will definitely contribute to strengthening environmental component in the policies and programs of various sectors of economy as well as promote coordination and cooperation for their planning and implementation. Political decision-making should be based at scientific data on actual role and values of ecosystems and biodiversity. Improved standards of living of population should be ensured through the methods of use of renewable natural resources in economic activity, which exclude their depletion and ensure their renewal for the benefit of future generations. It is necessary also to strengthen cooperation between scientific structures and stakeholders dealing with bioresource use (agricultural, forest and fish-breeding sector). The aims and methods on regulation of sustainable use of biodiversity should consider the prevention or minimization of unfavorable impacts on ecosystem services and the structure and functions of ecosystems and their components.

b) It is obvious that in order to have proper feedback from population regarding ecological problems and the atmosphere of mutual trust between the society and the state it is necessary to ensure provision of respective information and its dissemination in wide public as well as the presence of trained and educated human resources. In order to solve the mentioned problems it is necessary to develop and implement a program on public awareness raising and provision of information on importance of biodiversity and its role for human well-being with use of mass-media and other modern technologies, to provide training opportunities for various groups of public and others.

26. Enhancement of scientific research, knowledge management and capacity building in the field of biodiversity conservation and sustainable use of natural resources

1) The national targets related to the strategic direction on enhancement of scientific research, knowledge management and capacity building in the field of biodiversity conservation and sustainable use of natural resources are as follows:

a) To improve the knowledge, scientific foundations and technologies related to biodiversity status and trends, its monetary value as well as consequenses of biodiversity loss.
b) To enhance the training of specialists in biodiversity studies and to strenghten their professional capacities.

2) The need to achieve the mentioned targets is conditioned by the following considerations:

a) Continuous studies and monitoring are needed to have reliable data for identification, analysis and assessment of the state of biodiversity and its changes. It needs the presence of respective specialists, structures, methodology, material-technical and financial resources. At present intensive studies on the status of biodiversity and its trends as well as the consequences of biodiversity loss are ongoing in Armenia. However, it is necessary to focus more on the value of biodiversity and ecosystem services and their assessment, especially in the system of SPNAs, as well as on the studies regarding invasive species of flora and fauna. Dissemination of invasive species is one of the main threats to natural ecosystems and biodiversity caused by the direct anthropogenic impact. This refers also to expansive species. Over the recent years they have been intensively disseminating in the countries of their origin due to certain changes of conditions and have been penetrating to ecosystems, which are not typical for them. Penetation of alien species including microorganisms into natural ecosystems is considered biological pollution with irreversible results. Many alien species are characterized by high adaptability, intensive reproduction and high competitiveness. It should be mentioned that over the recent decade a number of alien species have penetrated to the territory of Armenia in the result of economic activities. Given the geographic location of the country and the trends of socio-economic development the invasion of alien species is expected to grow. In Armenia relatively active studies are being implemented for invasive plant species. However, almost no works have been done on identification and classification of alien species of fauna and assessment of their impact on natural ecosystems. It is necessary to identify invasive species of fauna and the mechanisms of their invasion as well as to assess their impact on natural ecosystems.
b) The growing environmental problems at international and regional levels and the efforts aimed at their solution require high professional capacities, well-established institutional and human potential, wide scientific research, dissemination and exchange of respective information as well as promotion of new ways of thinking and understanding in the society. International environmental processes cannot be viewed in isolation, they are closely linked with local (national) problems, which continuously grow and require urgent actions in the field of scientific research, establishment of a functional and effective system of training and retraining of specialists as well as development of mechanisms on provision of information and awareness raising in wide public.

   At the same time, at present in Armenia the financing of scientific research and training of specialists in the field of biodiversity studies is very insufficient. There is a problem of insufficient human resources and their professional capacities also in SPNAs. The Strategy for Resource Mobilization for 2008-2015 was developed in the frames of the Convention on Biological Diversity and adopted by decision IX/11 of the Conference of Parties in order to

mobilize financial resources in support of the achievement of biodiversity objectives. The target of the strategy is to substantially enhance international financial flows and domestic funding for biological diversity. Application of the principles of the strategy at national level can establish strong foundations for broadening scientific research and building human and technical capacities. It is necessary to promote intersectoral scientific research in the field of biodiversity use and conservation as well as to implement respective programs on public awareness raising and education.

VII. NationalAction Plan of the Republic of Armenia on Biodiversity Conservation, Protection, Reproduction and Use for 2016 – 2020

27. The aim of the NationalAction Plan of the Republic of Armenia on Biodiversity Conservation, Protection, Reproduction and Use for 2016 – 2020 (hereinafter the Action Plan) is to define realistic actions and timeframes for their implementation to promote achievement of the priority strategic targets of biodiversity conservation and management (Annex 2).

28. The contents of the Action Plan incudes the strategic directions defined in provision 1 of item 21 of this document and actions aimed at their implementation. The aims, implementers, implementation timeframes, sources of financing and expected outcomes are mentioned for each action.

29. Financing for the Action Planimplementation.

1) State and community budgets of the Republic of Armenia.
2) Payments for various services provided by organizations dealing with biodiversity conservation in Armenia, donations, inputs by sponsors and other inputs which do not contradict the legislation of the Republic of Armenia
3) Inputs by national factories, foundations, non governmental and other organizations.
4) International sources.

30. The program activities can be implemented by financial support of the above mentioned individual sources or co-financing from various sources.

31. Outcomes expected from implementation of the Action Plan

1) Development and introduction of realistic and effective management mechanisms to solve biodiversity problems of Armenia;
2) Identification and prevention of the main threats to biodiversity and ecosystems;
3) Improvement of intersectoral relations in biodiversity management;
4) Provision of social and economic benefits to population through sustainable use of biological resources;
5) Awareness raising of wide public on biodiversity problems and their engagement in decision-making processes.

32. The effectiveness of implementation of the Action Planis conditioned by mitigation or prevention of a number of possible risk factors. Table 5 below presents the risk factors, their consequences and required measures on their mitigation or prevention.

Table 5.The risk factors, their consequences and risk mitigation or prevention measures for the program implementation.

N	Risk	Consequence	Measures on risk mitigation or prevention	Responsibility
1.	Lack of financing	The program is not	a. Envisage respective	RA Ministry of Nature

		implemented	resources in the state budget b. Negotiations with donor organizations	Protection RA Ministry of Finances
2.	Insufficient awareness of stakeholders about the Action Plan	Failure to ensure participatory processes during the program implementation	Activities aimed at awareness raising on the aims, envisaged actions and expected outcomes of the Action Plan	RA Ministry of Nature Protection Mass media (by agreement) NGOs (by agreement)
3.	Low interest or engagement of stakeholders in the program implementation	The program does not serve its aims	Explanatory and awareness raising activities on biodiversity conservation and its socio-economic significance	RA Ministry of Nature Protection
4.	Delays in development, consultations and adoption of draft legal acts envisaged by the program	Obstacles to the process of organization of biodiversity conservation and sustainable use	Define responsibilities and timeframes for development and consultation of draft legal acts	RA Ministry of Nature Protection

33. Monitoring and assessment of implementation of the Action Plan

1) The aim of monitoring and assessment of theAction Planis to ensure its effective implementation in the defined timeframes. It will provide an opportunity to learn from the outcomes of implemented activities and to make respective changes andadjustments in the program if needed, it will ensure objectivity, transparency and corporate responsibility of respective processes. All the activities implemented in the frames of the Action Planare subject to annual monitoring. The monitoring criteria are defined as follows:

a) Timeframes envisaged for implementation of each activity.
b) Relevance of the processes for implementation of activities to their aims.
c) Expenditures of annual allocations for implementation of each activity.
d) Timely reports in agreed templates for implementation of each activity.
e) Engagement of stakeholders in activities under implementation and the proportion of fulfilled tasks.

2) The monitoring and assessment of the Action Plan implementation will be done by the Interministerial Coordination Council on Fulfillement of Obligations under the Convention established by decision of the Prime Minister of the Republic of Armenia according to Article 6 provision b) of the Convention, which says about the need to integrate resources aimed at biodiversity conservation and sustainable use.

Annex 2
to Protocol Decision N 54
of the RA Government
from 10 December 2015

National Action Plan of the Republic of Armenia on Biodiversity Conservation, Protection, Reproduction and Use for 2016 – 2020.

Activity	Aim	Implementers	Timeframes	Sources of financing	Expected outcomes
Strategic direction 1. Improvement of legislative and institutional frameworks related to biodiversity.					
1.1 Define a methodology on monetary valuation of ecosystem services (monetary valuation of water, soil and biodiversity resources) and test it in specially protected nature areas.	To establish normative-methodological bases for introduction of valuation of ecosystem services.	RA Ministry of Nature Protection RA Ministry of Agriculture	2019	Sources not prohibited by the RA legislation	Preconditions established for realistic monetary valuation of biodiversity and ESs.
1.2 Develop draft law on making amendments in the Republic of Armenia Law on Flora and the Republic of Armenia Law on Fauna.	To define the mechanisms on assessment of biological resources and determination of quotas of their use	RA Ministry of Nature Protection RA National Academy of Sciences (by agreement)	2017	Sources not prohibited by the RA legislation	Improved management of biological resources.
1.3Develop draft protocol decision of the RA Government on national criteria for forests with high conservation values in Armenia	To promote sustainable forest management	RA Ministry of Nature Protection RA Ministry of Agriculture	2020	Sources not prohibited by the RA legislation	Forests with high conservation values identified, their management improved.
1.4 Develop a procedure on exchange of data between collections of *ex*-	To ensure accessibility of genetic resources.	RA Ministry of Nature Protection RA Ministry of	2017	Sources not prohibited by the RA	The catalogues with respective information ensure their effective management and accessibility of

*situ*conservation (conservation outside of habitats) and include in national and international catalogues the passport and characteristic data regarding accessions of the collections		Agriculture RA National Academy of Sciences (by agreement)		legislation	data.
Strategic direction 2. Enhancement of biodiversity and ecosystem conservation and restoration of degraded habitats.					
2.1Carry out inventory and mapping of degraded and fragmented forest and pastureecosystems, identify direct and indirect causes of habitat loss	To promote conservation of biodiversity habitats.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Territorial Administration and Emergency Situations RA National Academy of Sciences (by agreement)	2019	Sources not prohibited by the RA legislation	The threats which cause degradation of key biodiversity habitats identified.
2.2 Carry out vulnerability assessment for rareecosystems of Armeniagiven the predicted climate change, including modelling of changes.	To promote adaptability of rare ecosystems to climate change.	RA Ministry of Nature Protection RA Ministry of Agriculture RA National Academy of Sciences (by agreement)	2020	Sources not prohibited by the RA legislation	The vulnerability of rareecosystems to climate change assessed with the aim to improve their status.
2.3 Continue inventory of Important Bird Areas, Important Plant Areas as well as Ramsar sites important for biodiversity conservation.	To provide reliable information for establishment of SPNAs and econet.	RA Ministry of Nature Protection RA Ministry of Agriculture RA National Academy of Sciences (by agreement)	2017-continuous	Sources not prohibited by the RA legislation	Presence of scientific justifications for *in-situ* conservation of biological and landscape diversity.
2.4 Carry out assessment of flora and fauna species by IUCN criteria, prepare GIS maps of habitats of endangered species.	To contribute to prevention of extinction of biodiversity components.	RA Ministry of Nature Protection RA National Academy of Sciences (by agreement)	2020	Sources not prohibited by the RA legislation	Preconditions established for more effective conservation of species.

2.5 Develop and implement action plans on conservation of large mammals in Armenia (Armenian mouflon, Bezoar goat, Red deer, Caucasian leopard).	To ensure conservation and rehabilitation of endangered species.	RA Ministry of Nature Protection RA National Academy of Sciences (by agreement)	2017-continuous	Sources not prohibited by the RA legislation	The state of populations of large mammals improved.
Strategic direction 3. Reduction of direct pressures on biodiversity and promotion of sustainable use.					
3.1Assess the impact of small hydropower plants and mining industry on biodiversity and ESs, develop and implement an action plan on impact elimination/mitigation.	To reduce anthropogenic pressure on biodiversity and ecosystems.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Territorial Administration and Emergency Situations RA Ministry of Energy and Natural Resources	2020	Sources not prohibited by the RA legislation	The results of assessment are used in the process of environmental expertise, the negative impact mitigated thanks to implemented actions.
3.2 Identify most used useful plant species and game animals, assess their resources and define quotas of their collection/hunting.	To promote introduction of the principles of sustainable bioresource management.	RA Ministry of Nature Protection RA Ministry of Agriculture RA National Academy of Sciences (by agreement)	2018 - continuous	Sources not prohibited by the RA legislation	Rational use of flora and fauna species based on clear information about biological resources.
3.3Develop proposals on introduction of incentives for biodiversity conservation in community and private lands.	To promote biodiversity conservation and sustainable use.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Territorial Administration and Emergency Situations	2019	Sources not prohibited by the RA legislation	Preconditions established for biodiversity conservation on community and private lands through incentives.
3.4Develop and implement ecotourism and agrotourism development programs in local communities.	To promote community development without compromising nature protection.	RA Ministry of Nature Protection RA Ministry of EconomyRA Ministry of Territorial	2020	Sources not prohibited by the RA legislation	Communities have additional/alternative income, conditions established for biodiversity conservation and sustainable

		Administration and Emergency Situations RA Ministry of Agriculture			use.
3.5Assess ecological status of rivers, which are spawning grounds of valuable fish species of Lake Sevan, identify the threats to species, develop and implement an action plan on restoration of populations of valuable fish species.	To ensure conservation and restoration of valuable fish species.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Territorial Administration and Emergency Situations	2016-continuous	Sources not prohibited by the RA legislation	The status of populations of valuable fish species improved.
3.6Develop and implement an action plan on restoration and conservation of old traditional varieties of cultivated plants, in particular those which are out of cultivation, and of their gene pool.	To promote conservation of the gene pool of traditional varieties of cultivated plants.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Territorial Administration and Emergency Situations RA National Academy of Sciences (by agreement) Armenian National Agrarian University (by agreement)	2017-continuous	Sources not prohibited by the RA legislation	The gene pool of old traditional varieties of cultivated plants effectively conserved.
Strategic direction 4. Elimination of the main causes of biodiversity loss through regulation of intersectoral relations and public awareness raising.					
4.1 Establish the Interministerial Coordination Council on Fulfillment of Obligations under the Convention on Biological Diversity by the Prime Minister decision.	To promote improvement of intersectoral relations in the field of biodiversity conservation and use.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Education and Science RA Ministry of Economy RA Ministry of Territorial	2016	Financing not needed	The actions in the economic and social sectors, which are linked to biodiversity conservation, use and restoration are coordinated and evaluated.

		Administration and Emergency Situations RA Ministry of Energy and Natural Resources RA Ministry of Healthcare RA National Academy of Sciences (by agreement)			
4.2 Develop proposals on mainstreaming biodiversity conservation and ecosystem approaches in the sectoral policies.	To ensure synergic policy frameworks in terms of biodiversity and ecosystem services.	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Territorial Administration and Emergency Situations RA Ministry of Economy RA Ministry of Energy and Natural Resources	2017	Sources not prohibited by the RA legislation	The issues of biodiversity conservation and ecosystem services considered in the sectoral policies and programs.
4.3. Analyze the methodology and international practice of assessing the impact of various sectors of economy on ecosystems and biodiversity with the aim to have nationally applicable methodologies for Armenia.	To promote reduction of anthropogenic impact on biodiversity and ecosystems.	RA Ministry of Nature Protection RA Ministry of Agriculture RA National Academy of Sciences (by agreement)	2020	Sources not prohibited by the RA legislation	Modern methodologies applied for assessment of the impact of various sectors of economy on ecosystems and biodiversity.
4.4Develop and implement a program on awareness raising and provision of information on conservation and sustainable use of biodiversity.	To promote knowledge and information base of public about the state of biodiversity, causes of its loss, biodiversity conservation, sustainable use and restoration.	RA Ministry of Nature Protection RA Ministry of Education and Science RA National Academy of Sciences (by agreement)	2019	Sources not prohibited by the RA legislation	Different segments of population are aware about biodiversity problems.

4.5Create an information internet resource on the issues of biodiversity conservation and sustainable use in the web-site of the RA Ministry of Nature Protection.	To ensure awareness on sectoral problems through modern technologies.	RA Ministry of Nature Protection	2016-continuous	Sources not prohibited by the RA legislation	The population is more aware about the role and value of biodiversity through a permanently functioning on-line resource.
4.6Raise awareness of various stakeholders about the Nagoya Protocol, discuss national approaches to the protocol and outline further steps.	To establish preconditions for ratification of the Nagoya Protocol.	RA Ministry of Nature Protection RA Ministry of Agriculture RA National Academy of Sciences (by agreement)	2018	Sources not prohibited by the RA legislation	More aware stakeholders support the process of the Nagoya Protocol ratification.
Strategic direction 5. Enhancement of scientific research, knowledge management and capacity building in the field of biodiversity conservation and sustainable use of natural resources.					
5.1Identifythe priority themes of scientific research related to biodiversity problems and implement respective scientific programs	To ensure scientifically justified biodiversity conservation and rational use of biological resources.	RA Ministry of Nature Protection RA Ministry of Education and Science RA National Academy of Sciences (by agreement)	2018	Sources not prohibited by the RA legislation	Main directions for scientific research are identified, the results of scientific research are used in administrative decision-making.
5.2Carry out inventory of invasive species, identify the ways of their penetration to the territory of the Republic of Armenia and assess the level of their dissemination in natural ecosystems.	To establish preconditions for prevention of the negative impact of invasive species.	RA Ministry of Nature Protection RA National Academy of Sciences (by agreement)	2020	Sources not prohibited by the RA legislation	Preconditions established for prevention of the impact of invasive species.
5.3Develop and implement training courses for various target groups on learning and strenghtening professional capacities in the field of biodiversity.	To promote learning in the field of biodiversity in various target groups	RA Ministry of Nature Protection RA Ministry of Agriculture RA Ministry of Education and Science RA National Academy of Sciences (by agreement)	2017-continous	Sources not prohibited by the RA legislation	The targets groups consider biodiversity issues in their work.

5.4Develop and implement a training course for streghtening professional capacities of the specialists for implementation of the system of biodiversity monitoring.	To safeguard quality and effective monitoring.	RA Ministry of Nature Protection RA Ministry of Education and Science RA National Academy of Sciences (by agreement)	2020	Sources not prohibited by the RA legislation	Full-scale and quality monitoring is implemented.