SIXTH NATIONAL REPORT

TO THE

CONVENTION ON BIOLOGICAL DIVERSITY

OF THE

REPUBLIC OF ARMENIA

EXECUTIVE SUMMERY

The issues concerning the conservation and sustainable use of biological diversity of the Republic of Armenia are an important and integral part of the country's environmental strategy that are aimed at the prevention of biodiversity loss and degradation of the natural environment, ensuring the biological diversity and human well-being. Armenia's policy in this field is consistent with the following goals set out in the 2010-2020 Strategic Plan of the Convention on Biological Diversity (hereinafter CBD):

1. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
2. Reduce the direct pressures on biodiversity and promote sustainable use
3. To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
4. Enhance the benefits to all from biodiversity and ecosystem services (hereinafter ES)
5. Enhance implementation through participatory planning, knowledge management and capacity building.

The government of the Republic of Armenia approved "the Strategy and National Action Plan of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity" (BSAP) in 2015 based on the CBD goals and targets arising thereby supporting the following directions of the strategy of the Republic of Armenia on biodiversity conservation and use:

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

In addition, delivering on the country's obligations under the CBD, and taking into account the ongoing international developments and the ecological and nature conservation related issues present in Armenia, RA Government approved "the Strategy and State Program of Conservation and Use of Specially Protected Nature Areas of the Republic of Armenia" (SPNA SAP) in 2014. The document set the following strategic objectives of development of SPNAs of Armenia, including:

1. Ensuring environmental sustainability and healthy and favorable environment for the population of the country through the development and enhancement of the SPNAs system.
2. Protection of ecological, socio-economic, scientific, educational, recreational and spiritual values of SPNAs that must be undertaken through the conservation, restoration and long-term use of ecosystems, genetic resources, biological and landscape diversity.

Based on the provisions of the above-mentioned fundamental documents, national targets (NTs) that are in line with the strategic directions of biodiversity will be presented and discussed in the relevant sections.

CHAPTER 1

INFORMATION RELATING TO THE NATIONAL TARGETS IMPLEMENTED AT NATIONAL LEVEL

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Armenia has assumed adequate obligations under the Strategic plan for biodiversity conservation and sustainable use 2011-2020 and the Aichi Biodiversity Targets.

National Target 1: Enshrine the mechanism of monetary valuation of biodiversity and ecosystem services in the legislation of the Republic of Armenia.

Logical justification of the target

In recent years, both in the world and Armenia, the public interest on the role and value of ecosystems and the improvement of the quality of life through services provided by them has increased dramatically. The use of an ecosystem approach in the decision-making concerning natural resources can help governments, communities and other stakeholders provide many benefits for the land users, landowners and the public.

However, currently the values of biodiversity and ESs in Armenia are not fully reflected in decision-making processes and are largely ignored during the country's socio-economic development planning. The incorporation of monetary valuation of the biodiversity and ESs into the economic development and poverty reduction strategies will require their adequate evaluation and enhancement of cooperation between the various stakeholders and the government. Realistic valuation of the ESs will allow evaluating the potential environmental losses expected during the implementation of projects in different areas, considering possible alternatives and choosing the options having the least negative impacts on ecosystems and biodiversity.

Depending on the country's capacities, biodiversity and ESs can be evaluated step-by-step. Starting with the values, that are easy to evaluate and proceeding to others.

It should be noted, that "Armenia Development Strategy for 2014-2025" approved by the RA Government Decree N 442-N from, March 27, 2014 did not define ESs valuation concept as well as the need to establish a legal basis for it.

Consequently, the issue relating to the improvement of the environmental legislation is challenging, since it does not provide for the regulation of processes using the ecosystem approach model, such as the complex planning of environmental and natural

resource conservation and utilization, enhancing the regeneration capacity of natural resources through best available technologies, and implementation of joint monitoring, management of information systems and ensuring interconnected components of the nature.

The need for economic valuation of biodiversity and ecosystem services must be legally enforced during planning and implementation of any economic project that affects the natural environment, as well as during assessment of ecological deprivations, while the principles of economic evaluation should be approved by the state.

It should be noted that the majority of the population of our country is not well informed about the environmental gains. As a result of implementation of this target the awareness of Armenia's population will contribute to the conservation of biodiversity and ESs.

The level of application of this target:

- [X] National
- [ ]

The linking between the National Target and Aichi Targets:

- [X] 1 [ ] 6 [ ] 11 [ ] 16
- [X] 2 [ ] 7 [ ] 12 [ ] 17
- [ ] 3 [ ] 8 [ ] 13 [ ] 18
- [ ] 4 [ ] 9 [ ] 14 [ ] 19
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Other Important Information

In order to contribute to the implementation of this national target, the following action was included in the BSAP: "1.1 Identify the ecosystem services cost estimation methodology and test it in specially protected nature areas "and in the SPNA -SAP"

Evaluating the benefits received from services provided by the ecosystems of the SPNAs and raising awareness about ESS within the local population''. This will create prerequisites for a realistic assessment of the value of the ESs, as well as enhancing the role and significance of SPNAs through the improvement of natural resources use management mechanisms.

Relevant web sites, links and files

www.arlis.am; www.mnp.am

National Target 2: Define the mechanisms for the assessing biological resources and determining their use quantities; improvement of the bioresources management system.

Logical justification of the target

In Armenia, biological resources are widely exploited (use of subalpine and alpine meadows as natural pastures, harvesting of edible and medicinal herbs, berries, hunting and etc.) and in some cases overexploited (forest resources, fishing). At the same time, the use of bio resources has essentially been carried out spontaneously without taking into consideration the natural reproduction potential of the resources and the necessary preconditions for ensuring it. A vivid example of overexploitation is the drastic reduction of fish stocks in the Lake Sevan, particularly the whitefish stock, which is in fact a result of mismanagement and ignoration of scientific justifications. The collapse of the whitefish population in the lake is explained by the unprecedented scales of poaching and breach of hunting rules, due to which, despite the ban on hunting of that fish, the individuals that have not yet reached maturity were captured.

The improvement of the living conditions of the population are to be ensured through the use of such renewable natural resources in the economic activities that exclude their depletion and guarantee their recovery for the benefit of future generations.

Non-wood forest use by the local population often occurs irregularly, disturbing the natural state of forest biodiversity, reducing the number of beneficial plant populations and the ecosystem integrity. Forest management plans developed for the forestry

enterprises do not contain planned activities on ensuring the migration of animals, determination of the amount of bio-resources subject to inventory and use, as well as on sustainable non-wood forest use. Forest inventory, maintenance of forest cadastre and biodiversity monitoring, as well as special forestry studies are inadequately conducted in the republic.

The irregularities described above are conditioned not only by the insufficient work of environmental management bodies, but also with the imperfect legislation, particularly in terms of setting norms and determining use quantities of bio-resources. The essential element of effective management of bioresources, which is stocktaking, inventory and monitoring are not yet implemented on a proper level and volume.

The lack of a comprehensive information system on biodiversity excludes the real assessment of the impact of anthropogenic and natural factors on the biodiversity, the estimation of damage caused, and most importantly, the decision-making based on accurate information.

It is necessary to take measures for economic assessment of forest ecosystems and biodiversity, which can justify the non-use or alternative use of the given forest ecosystem to obtain more benefits for a longer period. Such evaluations can also be conducted at forest SPNAs.

The level of application of this target:

☒ *National*

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The linking between the National Target and Aichi Targets:

☐ *1* ☒ *6* ☐ *11* ☐ *16*

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Other Important Information

Although the legislation on biodiversity conservation and use of bio-resource has improved over the past decades, the clarification of the principles of sustainable use of biodiversity, mechanisms for determining the assessment and use of biological resources, that are based on ecosystem approaches, modern scientific research and will be accessible and affordable for the population remain prioritized. The implementation of this target will create prerequisites for coordination of cross-sectoral activities in the field of biodiversity, implementation of single practice, exchange of information, improvement of decision-making processes and effective implementation of already adopted decisions.

The activity on the implementation of this national target "3.2 Identify widely-used useful plant species and game animals, assess their resources and define quotas of their collection/hunting" is included in BSAP, as well as in the action plan of the "Natural resource management strategy of the Republic of Armenia" approved by the Government of the Republic of Armenia in 2018.

Relevant web sites, links and files

www.arlis.am; www.mnp.am

National Target 3: Ensure accessibility of data and information exchange on genetic resources:

Logical justification of the target

Being a party to the Convention on Biological Diversity and the International Treaty on Plant Genetic Resources for Food and Agriculture, the Republic of Armenia made

commitments to promote accessibility of plant genetic resources, as well as fair and equitable sharing of benefits arising out of their use.

According to the provisions of the treaty the country is obliged to make the genetic diversity and relevant information on seed samples stored in seed collections available to all parties. At present, Armenian institutions engaged in the collection of crop samples have already included about 2500 samples in the international database. The national database containing data on 6586 samples, as well as databases of other institutions is not accessible to the public because of not being posted online.

In 2015, with the support of FAO, a new information exchange system for Armenia's PGRFAs was created as part of the international information system. The new WIEWS (http://www.fao.org/pgrfa) system includes passport data of 6586 samples stored in different institutions of the country, besides detailed information, publications and legal acts on institutions, professionals, breeders, varieties, implemented programs.

Characterization and evaluation data obtained in the result of implementation of selection and research programs are not included in databases and national and international directories due to the lack of a mechanism for data exchange between genetic banks and research organizations and the limited number of specialists in the field of databases management, which limits their accessibility for the beneficiaries and hinders the effective use of genetic resources.

In order to improve the situation, procedures/mechanisms should be developed for the provision and exchange of appropriate data between information holders on genetic resources, research and collection holding institutions, in order to make the information on genetic resources accessible for all beneficiaries and ensure the wide use of PGRFAs in selection programs.

Improving national legislation through implementation of this target will create prerequisites for ensuring the essential requirement of the Nagoya Protocol, making information about the genetic resources of Armenia available to all interested parties.

The level of application of this target:

☒ *National*

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The linking between the National Target and Aichi Targets:

☐ *1* ☐ *6* ☐ *11* ☒ *16*

☐ *2* ☐ *7* ☐ *12* ☐ *17*

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Other Important Information

The importance of establishing data exchange mechanisms in the biodiversity is highlighted in the BSAP, which includes the following activities "1.4 Develop a procedure on exchange of data between ex-situ collection holding institutions and include in national and international catalogues of passport and characteristic data regarding accessions of the collections" and "4.6 Raise awareness of various stakeholders about the Nagoya Protocol, discuss national approaches to the protocol and outline further steps".

Relevant web sites, links and files

https://www.cbd.int; http://www.fao.org/plant-treaty; www.arlis.am; www.mnp.am; http://www.fao.org/pgrfa

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National Target 4: Improvement of protection of biodiversity habitats by minimizing their degradation

Having a multifaceted and extensive nature this target includes various intersectoral aspects and comprised of the following sub targets

1. Determine the state of the habitats in danger of destruction and the main threats that lead to degradation and fragmentation of ecosystems;
2. Assess vulnerability of key ecosystems due to climate change, paying special attention to the nature of the anthropogenic impact in biodiversity-rich areas and climate change issues.
3. Promote the conservation of biodiversity and the full provision of EEs through restoration of degraded ecosystems.

Logical justification of the target

1. Determine the state of the habitats in danger of destruction and the main threats that lead to degradation and fragmentation of ecosystems: In Armenia and other countries, the deterioration of ecosystems is primarily related to the direct destruction of habitats of biodiversity components, which is due to mining, agriculture, construction, forest management, drying of marshes, construction and operation of reservoirs and SHPPs, seismic exploration and blasting operations, as well as unsustainable use of natural resources and environmental pollution. In addition to the complete degradation of ecosystems, habitat fragmentation of individual populations and species occurs in most cases during forest felling, construction of highways, railways, water lines, installation of power transmission lines and other types of activities. The fragmentation results in genetic isolation of endangered species populations and the quality of the habitat is reducing.

   It is known that some ecosystems, in particular those providing water supply services are more essential for people's well-being and health. The largest natural reservoir in Armenia, Lake Sevan, had a balanced ecosystem with natural fluctuations before the first decades of the 20th century. However, with the aim of satisfying the demands of energy and other economic sectors during the 20th century, the use of water resources increased with unprecedented rates and quantities. As a result, the lake level dropped by 19.6m compared with its original state. Its volume decreased

from 58.5 billion cubic meters to 33.0 billion cubic meters, while the surface area decreased from 1416.2 square km to 1238.1 square km.

The decrease of the water level of the lake Sevan caused deep-rooted and irreversible changes in the terrestrial and aquatic fauna and flora, including extinction of two subspecies of endemic Sevan trout and the reduction of the quantity of endemic khramulya, as well as aquatic plant species and invertebrates. In order to prevent negative processes and eliminate the consequences due to decrease of water level of the Lake Sevan, works aimed at raising water level were carried out. Due to this the level increased by about 3.7 meters since 2001. However, rates of water level increase, annual fluctuations and climate warming trends negatively impact the lake ecosystem, causing active blooming of water, activation of eutrophication processes, and difficulty in restoring fish stocks.

The situation of water ecosystems in Armenia has aggravated in recent decades due to the construction and operation of SHPPs that have resulted overuse of water resources, deterioration of river ecosystems and landscapes, and problems relating to the quality of life of the population. The needs of the aquatic fauna are largely ignored during the design and operation of SHPPs. The impacts of water regime change of mountainous rivers on coastal and aquatic ecosystems and biodiversity have not been assessed or studied. In addition, many SHPPs do not maintain the established quantities of permissible ecological discharges, which lead to degradation of river ecosystems.

The forests that provide ESs are indispensable for the population. They perform important climate and water-regulating functions, as well as contribute to the development of agriculture and actively accumulate carbon. It should be noted, that for the conservation of forest biodiversity, approximately 20% of any forest area should be protected from intensive exploitation, especially in the forests of high value of the region.

The need for introduction of sustainable land management approaches in terms of biodiversity conservation is more pronounced in pastures and hayfields. Uneven distribution of pressure on pastures is a significant threat to the natural ecosystems

used as pastures. Under exploitation of remote pasture result in ecosystem changes, in particular alpine carpets are replaced by alpine meadows, and the majority of community pastures have been overused and subjected to various types of degradation from the change of vegetation cover to the formation of erosion hearths. Due to the inefficient use and care, about 150 thousand ha areas were left out of agricultural use.

Today, the prevention of degradation of forest, wetlands and pasture ecosystems is perceived as a priority for the country. Therefore, in order to reduce the rates of loss of habitat, it is necessary to identify direct and indirect causes of loss of ecosystems and biodiversity and to assess the damages caused by adverse impacts. It is also necessary to develop and implement complex rehabilitation measures for degraded habitats that will prevent illegal forest use, stop groundless melioration of arid and semiarid habitats, take strict control over the use of hydropower resources (small HPPs) and reduce the impact of infrastructures.

2. Assess vulnerability of key ecosystems due to climate change, paying special attention to the nature of the anthropogenic impact in biodiversity-rich areas and climate change issues.

As a mountainous country with dry climatic conditions, in practice, Armenia's territory is entirely vulnerable to global climate change. Increasing temperature of the atmosphere, reduction of water availability, and damage caused by floods and droughts will increase challenges for the sustainable development of Armenia.

According to scientific findings, changes of temperature will lead to the formation of a new physico-geographical climate system. According to the UNFCCD 2nd National communication on climate change of Armenia (2010) Climate change will result in the expansion of desert, semi desert and arid sparse forest areas, at the expense of the vertical shift of their upper limits. Further, upward shift of steppe ecosystems by 250-300 m will occur and the areas of meadow ecosystems will shrink. As a result, significant changes in composition and structure of ecosystems will take place. Meadows will also reduce. More than 17,000 hectares of forest (5-5.5%) may

disappear due to unfavorable conditions for forest growth. It was found that currently forest areas have significantly reduced. While the semi-desert and steppe vegetation zones have expanded, alpine vegetation zone has shrieked. Soil erosion and desertification phenomena have become more active in the semi-deserts, with the semi-desert zone expanding up the mountain profile by 50m. Separate xerophilous species can already be found at areas 200-300m higher as compared to their former growing areas.

Such diverse changes naturally have a profound effect on both the natural resources and the healthy lifestyle of society. The reduction of these impacts will require the increased resistance to ecosystems and the application of special climate adaptation measures related to water and forest management, land use, food production and human health.

In this context, the most important problem is to identify key vulnerable ecosystems and biodiversity-rich areas, to predict possible change in the climate factor of their biota and to propose negative impact mitigation measures.

3. Promote the conservation of biodiversity and the full provision of EEs through restoration of degraded ecosystems.

Carbon accumulation and carbon footprint changes depend on the volume of forest logging and the number of forest fires. Carbon storage is most negatively influenced by illegal logging, which is carried out without the maintenance of norms, in many cases using rare and valuable species of forest diversity. In order to achieve this situation, the Government of Armenia has undertaken to expand Armenia's forest cover to 20.1% as a measure to mitigate climate change. Moreover, this goal is to be achieved by 2050. Currently, it is important to explore and evaluate the potential for carbon absorption and accumulation by all ecosystems, as well as the implementation of regeneration program of the most important ecosystems.

From the point of view of resistance of ecosystems and accumulation of carbon resources preservation and restoration of wetlands is also important both in the Lake Sevan basin and in other places. The poor condition of the Lake Sevan ecosystem is first of all conditioned by the reduction of water level, lake volume, the violation of the balance of vital elements and the loss of nutrient supply chain and the extinction of

biodiversity components. At the same time, one of the problems of the Lake Sevan is the contamination with large quantities of wastewater, mineral fertilizers and agricultural waste.

The inefficient use of groundwaters by fisheries in the Ararat Valley has led to the drainage of many springs and wetland areas that serve as habitat for many species of flora and fauna. In this regard, the transition to closed water-use system will contribute to the restoration of water resources and will provide favorable conditions for the survival and reproduction of waterfowl birds, fish, and other representatives of aquatic world.

The level of application of this target:

☒ National

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The linking between the National Target and Aichi Targets:

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Other Important Information

The issue of reducing the negative pressure on biodiversity and degradation of ecosystems has been thoroughly analyzed in the BSAP, with a number of important activities being envisaged, including "2.1Carry out inventory and mapping of degraded and fragmented forest and pasture ecosystems, identify direct and indirect causes of habitat loss" and "2.2 Carry out vulnerability assessment for rare ecosystems of Armenia

given the predicted climate change, including modeling of changes". The following activity is included in the SPNA SAP "Disclosure of possible impacts of climate change and desertification (especially due to mining industry) on ecosystems and ES in SPNAs and development and implementation of action plan aimed at mitigation of its effects".

Relevant web sites, links and files

www.unfccc.int; www.arlis.am; www.mnp.am; www.armstat.am; www.wrma.am;

National Target 5: Enhance in-situ and ex-situ conservation of the biological diversity

Logical justification of the target

The goal of this multidimensional target is to address the following key issues:

1. To develop and expand the system of SPNAs for complete coverage of key types of landscapes and ecosystems and the full range of species included in the Red Book of Armenia; to improve the management and financial sustainability of the SPNAs; to formulate the key environmental and socio-economic approaches of the ecological network and introduce appropriate pilot projects.

Currently, the total area of the SPNAs of Armenia is 387 thousand hectares or about 13% of the territory of the republic. Technical modernization of areas, training of personnel engaged in the protection activities, expansion of scientific researches and etc. are being implemented with the financial support of international organizations. Principles, approaches, clear and realistic actions promoting the development and management of Armenia's SPNAs are expressed in the “Strategy and National Program for Conservation and Use of Specially Protected Nature Areas” approved by the RA government in 2014.

At the same time, different types of ecosystems / landscapes, as well as the areas covering the rich and unique biodiversity under anthropogenic impact, in particular the

high mountainous areas rich with wild relatives of cultivated plant species are disproportionately represented in the system of SPNAs of Armenia.

Currently, Armenia's SPNAs system does not meet international standards and the conditions envisaged for the establishment of an ecological network. High density of the population, developed infrastructures, significant areas of agricultural land make it difficult to allocate land for the establishment of new SPNAs and ecological corridors. Financial and legal issues relating to the land alienation for establishment of SPNAs and providing compensation for nature use restrictions in the conservation zone and eco-corridors have not yet been addressed. At the same time, it should be noted that the interested institutions of the republic demonstrate political will to address these issues, both in terms of expansion of the SPNA system and the creation of ecological corridors.

2. Improve the ex-situ conservation of the biodiversity through expansion of genetic banks and other collections, establishment of wildlife breeding farms and nurseries, and use of appropriate technologies:

Genetic diversity in Armenia is presented by

- Different varieties of crops and species of domestic animals of economic value,
- Wild relatives of cultivated crops and domestic animals,
- Traditional farmer varieties and tribes,
- Wild edible plants.

The listed components are exposed to adverse effects of various anthropogenic and natural factors, and therefore require the use of technology for reproduction and restoration. Ex-situ conservation of plant and animal genetic resources is of particular importance, which gives the opportunity to recover resources endangered or destructed by natural disasters or human factors, providing researchers and farmers with the opportunity to use these resources regularly.

Despite the achievements in the field of ex-situ conservation of genetic resources over the past decades, the country's species and interspecies diversity are not yet fully represented in the live collection of plants and animals, available seed and germ

banks, which at the same time due to lack of technical, financial and human potential, cannot ensure the gene pool protection and reproduction ability.

From this point of view, actions are needed for the expansion of existing ex-situ collections, their enrichment, provision of up-to-date equipment, and creation of new highly professional collections.

3. Identify and classify the invasive and expansive species, assess their condition, the dangers created for natural ecosystems, and take measures to control penetration and movement paths of existing and potential invasive plant and animal species.

In Armenia, the highest concentration of invasive species are observed in habitats under anthropogenic impact, and recently also in ecosystems endangered by climate change. Agricultural areas, forests and water ecosystems are the most vulnerable. The invasion process has dramatically accelerated due to the intensification of relations with different countries (political, cultural, commercial and other), as well as due to the rapid growth of traffic stream. Taking into consideration the geopolitical position and socio-economic development trends of the republic, the process of invasion of alien species will gradually become stronger. Moreover, if relatively intensive studies are conducted relating to the invasive plant species of Armenia, there are few studies to identify, classify alien animal species and analyze their impact on natural ecosystems. The determination of the species composition of invasive animals and the disclosure of their quantity and distribution is currently a problem. Mechanisms and ways of invasion of alien animal species should be clarified and the impact of these species on the ecosystems must be assessed. It is necessary to organize the monitoring of alien species for which training of qualified specialists is needed, developed normative-legal and methodological base, as well as public awareness.

The level of application of this target:

☒ National

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The linking between the National Target and Aichi Targets:

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Other Important Information

The steps needed to improve the in-situ and ex situ conservation of biodiversity are thoroughly analyzed in the BSAP thanks to which the following activities have been included: 2.4 Carry out assessment of flora and fauna species by IUCN criteria, prepare GIS maps of habitats of endangered species; 2.5 Develop and implement action plans on conservation of large mammals in Armenia (Armenian mouflon, Bezoar goat, Red deer and Caucasian leopard); 5.2 Carry out inventory of invasive species, identify the ways of their invasion to the territory of the Republic of Armenia and assess the level of their distribution in natural ecosystems.

SPNA SAP which defines the strategic directions for the development of Armenia's SPNAs among others includes “development of SPNA system” direction eight actions of which are aimed at the creation of new protected areas and revision of existing borders of SPNAs, establishment of the National ecological network, and so on.

Relevant web sites, links and files

www.arlis.am; www.mnp.am; www.armstat.am;

National Target 6: Take the necessary measures to reduce the pressure on biodiversity

Logical justification of the target

Open pit mining, construction, logging, development of agricultural and hydropower, unregulated tourism and recreation are examples of vivid exposure to direct pressure on biodiversity that cause the loss of diversity habitats.

The Government of the Republic of Armenia has declared mining a priority industry of the economy, providing 17% of the country's GDP. However, this branch of industry is largely developed without comprehensive assessment of the environmental and social consequences, as a result of which the mining industry continues to have disastrous consequences for the nature and the health of the population.

The geo-ecological effects of mining (such as disturbance of soil cover, expansion of tailing dumps, accumulation of wastes, pollution of water resources) fragment the flora and fauna populations and communities, violate animal migration routes and threaten the existence of some rare species.

Development of agriculture, construction and hydropower also affects ecosystems and causes changes in species and genetic diversity and direct loss of their components (Lake Sevan fish stock, forest non-wood resources and edible plants of pastures). This situation first of all affects socially vulnerable groups that are directly dependent on natural bio resources and ecosystem services. Loss of biodiversity and changes in ecosystem functions indirectly affect people's health and livelihoods, income, and local migration, which sometimes can even lead to domestic political conflicts.

The level of application of this target:

☒ National

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The linking between the National Target and Aichi Targets:

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Other Important Information

BSAP envisages actions aimed at the implementation of this target: "3.1 Assess the impact of small hydropower plants and mining industry on biodiversity and ESs, develop and implement an action plan on impact elimination/mitigation; 3.5 Assess ecological status of rivers, which are spawning areas of valuable fish species of the Lake Sevan, identify the threats to species, develop and implement an action plan on restoration of populations of valuable fish species; 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.

Relevant web sites, links and files

www.arlis.am; www.mnp.am; www.armstat.am;

National Target 7: Establish mechanisms for promoting biodiversity conservation and sustainable use.

There are many positive incentives that can be used to promote biodiversity conservation and sustainable use. In many countries, such incentives apply to the reduction of state fees, taxes, fees or tariffs as a result of which advantages or privileges are granted for activities that are favorable for biodiversity conservation and / or sustainable use. Payments for ESs are a direct and flexible incentive mechanism that provides immediate cash compensation by the user to an individual or community deciding on the provision of ESs in the field of nature use. However, in the application of

various incentive mechanisms requires some flexibility and consideration of the local conditions. Mechanisms for the promotion of renewable resources are primarily relevant for Armenia, particularly in terms of forest regeneration that is important as habitat for species and a source of ESs. The Forest Code of the Republic of Armenia (2005) promotes the establishment of forests in non-forested areas and areas that do not have natural regrowth for free use, if the users carry out afforestation at their own expenses.

RA Government decision N 1535-N approved in 2011 “on granting privileges for nature use fees to extract wastewood for non-production (non-industrial) use by families residing in the forest adjacent settlements of the Republic of Armenia” allowed the families residing in forest adjacent communities to extract (on their own expense or from the local forestry branches) up to 8 cubic meters of firewood free of charge.

For the practical implementation of positive incentives for the conservation and sustainable use of biodiversity, it is necessary to develop and introduce legislative and economic mechanisms for the payment of ESs as well as incentives promoting the development of Armenia's SPNA system.

The introduction of incentive mechanisms shall help direct the compensation to landowners for expanding the boundaries of existing SPNAs, establishing new SPNAs and environmental corridors, which will contribute to both the activities of organizations involved in the management of SPNAs and increasing efficiency of stakeholder engagement process in participatory governance processes.

The level of application of this target:

☒ National

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The linking between the National Target and Aichi Targets:

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Other Important Information

The envisaged activities directed at the implementation of this target of BSAP include the following activity “3.3: Develop proposals on introduction of incentives for biodiversity conservation in community and private lands”.

Relevant web sites, links and files

www.arlis.am; www.mnp.am;

National Target 8: Improve the conservation of genetic diversity of wild relatives of cultivated plants and domestic animals, as well as valuable socio-economic and cultural species:

Logical justification of the target

Increased human impact, increased pests and diseases, climate changes and environmental disasters are the main factors that seriously threaten plant and domestic animal genetic resources and their diversity for food and agriculture in the country. These threats are largely similar to those that endanger Armenia's overall biodiversity, including:

1. Loss of habitat caused by direct destruction of ecosystems due to mining, construction and climate change, and the expansion of the desertification process.
2. Reduction of valuable natural plant populations of wild relatives of cultivated crops, pastures and hayfields because of the previously cultivated and currently abandoned areas.

3. About 33% or 150,000 arable lands are covered with aggressive weeds and have become center of reproductive and source for distribution to cultivated lands and natural ecosystems.
4. Degradation of natural ecosystems, changes in biodiversity and loss of about 11% due to land degradation (soil erosion and secondary salinization).
5. Genetic erosion, which occurs due to rapid replacement of traditional varieties with hybrid and modern varieties.
6. overgrazing of pastures and hayfields, uneven distribution of pressure on pastures, which results in changes of ecosystems and varieties of plant genetic resources (in particular alpine carpets are replaced by alpine meadows and sub-alpine weeds actively invade alpine ecosystems), as well as deterioration of feeding conditions for domestic animals.
7. Invasion of alien species, which have significantly expanded the limits of their distribution over the last years (probably due to changes in climatic conditions and the expansion of destructed areas of habitats).
8. Unregulated harvest of wild edible plants (with violation of timing and methods), which affects their natural regeneration.

At the national level a number of actions can contribute to the improvement of the sustainability management of genetic resources including the following: enhancement of legal and regulatory framework, expansion of in-situ conservation through inclusion of areas rich in wild relatives of cultivated plants in SPNAs system, ensuring ex-situ conservation through preserving species, varieties and genetic material in botanical gardens, seed collections and genetic banks; raising awareness on the role of genetic resources; establishment of strong partnerships among conservationists, users and farmers to promote the targeted use of genetic material.

The level of application of this target:

☒ National

☐

The linking between the National Target and Aichi Targets:

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☒ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other Important Information

The activities envisaged in BSAP aiming at the implementation of this target include the following: “3.6 Develop and implement an action plan on restoration and conservation of old traditional varieties of cultivated plants and gene pool, in particular no longer cultivated varieties”. “The national action plan on conservation and sustainable use of plant genetic resources for food and agriculture of the republic of Armenia” was elaborated in 2017 and is currently under discussion. It includes the analysis of the current state of the mentioned resources, identified problems and priorities, elaborated development directions and action plan for 2017-2022.

Relevant web sites, links and files

www.arlis.am; www.mnp.am;

National Target 9: Strengthen cooperation between state institutions and the civil society; raise awareness of the population about biodiversity issues.

Logical justification of the target

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.

It is particularly important to enhance the capacities of the entities involved in different sectors (economic, financial, agricultural, nature use, scientific, etc.), raise awareness of the population about modern approaches and principles of nature protection, which are enshrined in CBD and are now developing through its protocols and decisions.

The recruitment of highly qualified and ecologically conscious stuff in the legislative and executive bodies and other state and business structures is necessary for the successful implementation of international commitments undertaken by Armenia and, as a consequence, the establishment of an ecologically safe and healthy environment.

Sectoral issues related to the conservation of biodiversity and, in particular, the monetary valuation of biodiversity, are hardly included in the activities carried out with the population, as well as in the system of ecological education or in media campaigns:

As a result, the low awareness for proper decision-making and the lack of necessary studies and imperfect information base as well as wrong understanding of the need of scientific valuation of biodiversity and ecosystem services make obstacles for taking steps aimed at mitigation of further loss of biodiversity and destruction of natural capital.

The level of application of this target:

☒ National

☐

The linking between the National Target and Aichi Targets:

☒ 1 ☐ 6 ☐ 11 ☐ 16

☐ 2 ☐ 7 ☐ 12 ☐ 17

☐ 3 ☐ 8 ☐ 13 ☐ 18

☐ 4 ☐ 9 ☐ 14 ☐ 19

☐ 5 ☐ 10 ☐ 15 ☐ 20

Other Important Information

The activities envisaged in BSAP aiming at the implementation of this target include the following: “4.4 Develop and implement a program on awareness raising and provision of information on conservation and sustainable use of biodiversity; 4.5 Create an information internet resource on the issues of biodiversity conservation and sustainable use in the web-site of the RA Ministry of Nature Protection: 4.6 Raise awareness of various stakeholders about the Nagoya Protocol, discuss national approaches to the protocol and outline further steps”.

The following activities are included in the SPNA SAP “2.9 Development and implementation of public awareness raising and environmental education program on SPNAs; 2.10 Valuation of benefits received from ecosystem services in SPNAs, awareness raising among the local population; 2.13 Disclosure of community participation forms in SPNA conservation, use and ecotourism development.

Relevant web sites, links and files

www.arlis.am; www.mnp.am;

National target 10: Take measures to introduce mechanisms in the inter-sectoral economic relations that will exclude violations of environmental sustainability in the result of the use of natural resources.

Logical justification of the target

In Armenia the application of green economy principles and the success of the environmental policy are largely dependent on the integration of various socio-economic

systems in the conditions of harmonization and coordination of actions of public administration bodies, local self-governing bodies, international organizations and the private sector. Therefore, the policies of agricultural, industrial and energy sectors should be in line with the environmental policy.

At present, in Armenia CBD principles are still not included in the socio-economic development programs of different sectors. There is a lack of correlation between the processes taking place in the country, the level of awareness of the decision-makers on the issues relating to the Convention, as well as the level of ecological education of the population are low, while ecological culture and thinking are completely missing. There are no clear mechanisms of inter-sector collaboration, while joint actions required for corporate responsibility and risk management in the field of biodiversity management are not defined.

From this respect, to strengthen the environmental component it is urgent to involve environmental issues in development programs and strategies of different sectors of the country's economy, which will support the coordinated planning and management of ongoing processes with prevalence of principle of ecosystem approach.

Political decision-making should be based on scientific information that identifies the role and value of ecosystems and biodiversity that will be accessible and available at the same time for the population.

The level of application of this target:

☒ National

☐

The linking between the National Target and Aichi Targets:

☐ 1 ☐ 6 ☐ 11 ☐ 16

☐ 2 ☐ 7 ☐ 12 ☐ 17

☐ 3 ☐ 8 ☐ 13 ☐ 18

☒ 4 ☐ 9 ☐ 14 ☐ 19

☐ 5 ☐ 10 ☐ 15 ☐ 20

Other Important Information

The activities envisaged in BSAP aiming at the implementation of this target include the following ”4.1 Establish the Interministerial Coordination Council on Fulfillment of Obligations under the Convention on Biological Diversity by the Prime Minister decision; 4.2 Develop proposals on mainstreaming biodiversity conservation and ecosystem approaches in the sectoral policies”.

The following activity is included in the SPNA SAP “3.9 Disclosure of hazards threatening the SPNA system development in strategies of different sectors, projects, plans and development of action plan aimed at their mitigation”.

Relevant web sites, links and files

www.arlis.am;

National target 11: Improve knowledge, scientific basis and technology related to the state and trends of biodiversity, its monetary value, and the effects of its loss:

Logical justification of the target

In the last five years, active studies on the state and trends of biodiversity and consequences of its loss have continued in Armenia. However, there has emerged a need to pay more attention to the cost value of biodiversity and ESs and their valuation, especially in the system of SPNAs. The results of the economic evaluation of ESs of SPNAs are an informational basis for a wide range of administrative issues. In this regard, it is necessary to significantly increase the level of biodiversity research through the enhancement of scientific research and improvement of the monitoring system, including the studied or not studied major taxa and communities to reveal their current

state and trends of change. Conduct an assessment of the important species of fauna and flora according to IUCN standards, carry out monitoring of the most important ecosystems / habitats in the country and the specific, most endangered species.

It is essential to promote and support cross-sectoral research in the field of biodiversity use and conservation, as well as implement public educational and awareness raise programs.

The level of application of this target:

☒ National

☐

The linking between the National Target and Aichi Targets:

☐	1	☐	6	☐	11	☐	16
☐	2	☐	7	☐	12	☐	17
☐	3	☐	8	☐	13	☐	18
☐	4	☐	9	☐	14	☒	19
☐	5	☐	10	☐	15	☐	20

Other Important Information

The activity envisaged in BSAP aiming at the implementation of this target include the following “5.1Identifythe priority themes of scientific research related to biodiversity problems and implement respective scientific programs”.

The following activity is included in the SPNA SAP “2.4 Choosing the priority research topics on SPNAs and their implementation” and “2.10. Valuation of benefits received from ecosystem services in SPNAs and raising awareness among the local population on the issue.

Relevant web sites, links and files

www.arlis.am;

National target 12: Enhance the process of training of specialists in biodiversity research and improve their qualification

Logical justification of the target

The professional skills and qualification of human resource of the biodiversity conservation and management system need to be enhanced and improved. From this point of view, there are great difficulties in the fields of forestry and SPNA management. It has already been mentioned that in order to improve the professional skills of the forestry staff and the quality of the work, it is necessary to train both the staffs of the central system and the territorial units. Similar problems were disclosed in the SPNAs system for which the level of professionalism of the personnel involved in the management of the protected area is of special importance. As a result of improved professional, technical, economic and communication skills, staff will perform more efficiently the functions aimed at the protection of flora and fauna species and historical and cultural monuments, scientific research, regulated tourism, including organization of ecotourism, raising public awareness, cooperation with communities neighboring SPNAs and others. As a result, SPNA specialists will acquire skills and harmonize these with the economic, social, and environmental spheres of public life and will be able to apply that knowledge when establishing relationships with business circles, tourists, the local population, and other stakeholders. It should also be noted that the organizations involved in the management of SPOs are not included in the civil service system, as a result of which the professional qualifications of the personnel are, in best instances, sometimes implemented within the framework of international programs which are not of continuous. The elaboration and implementation of the Personnel Qualification Program will allow the staff of the SPNAs to strictly coordinate and participate in training courses at regular intervals. As a result, the gap between the knowledge and capacities of civil servants and staff of SPNA in the

public administration system will be minimized, which will lead to improved overall management of SPNAs.

The level of application of this target:

☒ National

☐

The linking between the National Target and Aichi Targets:

☐ 1 ☐ 6 ☐ 11 ☐ 16

☐ 2 ☐ 7 ☐ 12 ☐ 17

☐ 3 ☐ 8 ☐ 13 ☐ 18

☐ 4 ☐ 9 ☐ 14 ☒ 19

☐ 5 ☐ 10 ☐ 15 ☐ 20

Other Important Information

The activities envisaged in BSAP aiming at the implementation of this target include the following: “5.3: Develop and implement training courses for various target groups on learning and strengthening professional capacities in the field of biodiversity; 5.4: Develop and implement training courses for strengthening professional capacities of the specialists for introduction of biodiversity monitoring system”.

The following activity is included in the SPNA SAP "2.8: **Development and implementation of staff qualification training programs of organizations implementing SPNA management"**.

Relevant web sites, links and files

www.arlis.am;

CHAPTER II

THE MEASURES UNDERTAKEN FOR THE IMPLEMENTATION OF THE NATIONAL TARGETS DURING 2014-2018 AND THE ASSESSMENT OF THEIR EFFICIENCY

The measures undertaken in Armenia during 2014-2018 for the purpose of preventing the threats to biodiversity and ecosystems and eliminating/mitigating the existing negative impacts derive from the priority strategic directions set out in BSAP.

The efforts of the RA government to address the biodiversity issues are aimed at improvement of the legislation and governance system, rehabilitation of degraded ecosystems, development of specially protected nature areas, mitigation of climate change and its impact on humans and natural environment, as well as introduction of green economy ideas and principles into the country's economy. Moreover, it is important to initiate the actions aiming at the prevention of biodiversity loss or improvement of ecosystems earlier, since the trends in the state of the components of nature can manifest themselves only in the longer run. It is therefore difficult to assess the effectiveness of some of the initiatives in a timely and objective manner, due to data scarcity, timing constraints of monitoring, or the conservative character of the phenomena.

1. Legislation

A number of legal acts were elaborated and adopted concerning flora and fauna, forests, specially protected nature areas, education and other sectors aiming at ensuring

conservation and sustainable use of biological diversity in Armenia during the period of 2014-2018.

The RA government approved the “Strategy and National Program for Conservation and Use of Specially Protected Nature Areas” (SPNA-SAP) in 2014, which defined the main strategic goals and targets for the development of Armenia's SPNAs. The introduction of these strategic goals and targets will ensure effective protection of landscapes and their components in SPNAs, restoration of the self-regulatory potential of ecosystems, reasonable long-term use of SPNAs with appropriate status and adjacent areas and the mutually beneficial coexistence of the society and nature.

The strategic priorities of the SPNAs include the improvement of SPNA legislation, enhancement of SPNA management and strengthening institutional links, ensuring representation of biological and landscape diversity in the SPNA system.

"Strategy and National Action Plan of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity" adopted by the Government of the Republic of Armenia in 2015 (BSAP) outlines the strategic directions, targets for biodiversity conservation and use and activities to address them.

The "Concept paper on management of natural resources of the Republic of Armenia" was approved by the order of the president of Armenia which defined the principles, key issues and directions of management of natural resource. In 2018, the RA government approved the "Natural Resources Management Strategy and the program of measures ensuring the implementation of the natural resources management strategy". “Identification of widely-used plant species and game animals, evaluation of their resources and determination of quotas of their collection and hunting” action is included in the action plan of the mentioned strategy. The latter is of continuous nature, while the first outcomes are expected in 2019.

The RA Tax Code was adopted in 2016. Article 208 of the code stipulates the new natural resources use payment rates for the use of biological resources.

The RA law “on making amendments and supplements to the RA Law on compensation tariffs for damage caused to flora and fauna as a consequence of violation of environmental protection laws” was approved by the RA government in 2017. It

established compensation tariffs for caused damage due to hunting and/or destruction of Red Book plant and animal species. The law envisages penalties not only for vertebrate, but also invertebrate animals, which is crucial for the protection of rare and endangered species.

Due to strict administrative measures against illegal logging tariffs for the compensation of damage to illegally harvested timber and products produced from it discovered in territories outside the forest or during transportation were envisaged.

A number of decisions have been elaborated and approved by the Government of the Republic of Armenia in the area of improvement of legislation related to specially protected nature areas and protection of flora and fauna objects. In particular,

The Government of the Republic of Armenia has approved the regulation on the protection, preservation and use of flora objects (hunting areas) and the list and corresponding schemes of the hunting areas by marzes by decision N 860-N in 2016. This has helped identify the areas included in the list and intended for hunting which creates legal basis for reducing the pressure on biodiversity in other areas. At the same time, it provides prerequisites for the creation of hunting farms where the implementation of biotechnical measures will allow for the regulation of the sustainable use of hunting resources. Hunting grounds have been determined based on the species and number of animals not registered in the Red Book of the RA.

1. The RA Government adopted decree No. 781-N on “Establishing the procedure of utilization of items of flora for their protection and reproduction in natural conditions” in 2014, which defines measures to protect the newly detected species registered in the Red Data Book of Armenia including delineation of the protection zones and limitation of some of the economic activities there.
2. In 2017, according to the Government Resolution N 190-N, the management plan of "Dilijan" national park for 2017-2026 and priority management measures" were approved.
3. In 2018, the Government of Armenia approved the "Concept of development of state environmental monitoring", while the deriving "Action plan of development of state environmental monitoring for 2018-2021" is under discussion.

The following documents were also elaborated during the mentioned period:

1. The RA draft law "on making amendments to the RA Law on Specially protected nature areas". The draft law intends to clarify the competences of different bodies in the SPNA management system. The authorized body has been assigned with the authority of management coordination. Natural monuments and protected landscapes can be managed by LSGs. A new SPNA category, protected landscapes, have been added to the the existing four categories of SPNAs. Protection regimes and types of use, including eco-tourism of all categories of SPNAs, have been clarified. Provisions for the establishment and management of conservation zones, ecological networks and ecological corridors, environmental monuments, biodiversity conservation sites and protected landscapes have been clarified.
2. A new draft of the Forest Code has been elaborated. At the same time, within the framework of ENPI-FLEG 2, the World Bank will review and revise forest legislation, as well as issues concerning the improvement of the institutional and administrative structure. The action will include analysis, disclosure of contradictions and inconsistencies.
3. The draft laws of the Republic of Armenia "On making amendments to the RA laws on Flora and on Fauna" have been elaborated and submitted to the RA Government, which envisage a number of changes related to the use of bio resources, regulation of use rights and defininition of the procedure on provision of permits for keeping and performing inventory of animals in free and semi-free conditions.
4. The Ministry of Nature Protection of the Republic of Armenia has submitted the draft Protocol Decision of the Government of the Republic of Armenia "on the criteria for defining the high-value conservation forests of the Republic of Armenia" to the relevant bodies, which is currently under discussions.
5. The developed "procedure on the collection and exchang of data between institutions engaged in maintanance of ex-situ collections of flora and fauna species" sets out the mechanism for providing and disseminating relevant information on genetic resources among information providers, research and collection holding institutions, in order to make the information on genetic resources available to all beneficiaries.

6. The draft law of the Republic of Armenia "on making amendments and supplements to the RA water code" has been elaborated to regulate provision of water use permit for the construction of a new SHPPs; besides the construction of SHPPs on the rivers where spawning areas of fish species registered in the Red Book of Armenia or reginal endemic fish species are present, conservation zones of specially protected nature areas, areas adjacent to natural monuments with the radius of 150m and protection zones of aquatic ecosystems will be prohibited.

Which national target or Aichi target is supported by this measure?

- NTs – 1,2,5
- Aichi target – 7, 11, 12, 14

Assessment of the effectiveness of this measure

☐ The measure taken is partly effective.

Justification of the conducted evaluation

During the mentioned period, key concepts and strategic documents relating to the conservation and sustainable use of flora and fauna, as well as the action plans deriving from them were developed and endorsed by the Government of the Republic of Armenia with schedules for implementation of the planned activities and responsible parties.

As a result of the decisions approved by the Government of the Republic of Armenia, the mechanisms for the conservation of species registered in the Red Book of Armenia, management of specially protected nature areas and measures to reduce anthropogenic activity on ecosystems will be regulated.

However, the slow pace of adoption of the important sectoral draft laws and government decisions hinders the implementation of activities envisaged in the strategic documents.

Relevant web sites, links and files

www.arlis.am; www.mnp.am; http://forestcommittee.am

2. Management System

In 2017, the government of Armenia has approved the "concept, strategy and the list of activities on reforms in the forest sector". For the purpose of improving the institutional system of forest protection and management in Armenia in 2018 "Hayantar" SNCO has been subordinated to the Ministry of Nature Protection and a state forest committee has been established. Department of bodiversity and forest policy has been established within the structure of the Ministry of Nature Protection of the Republic of Armenia.

It is envisaged to stabilize, improve and develop the management systems in the field of forest protection, preservation, reproduction and use, increase the effectiveness of combating illegal logging, ensure the integrated forest management with application of ecosystem approach in line with international principles through the change of the State forest authorised body, and expansion and clarification of its competences.

The effectiveness of the initiated reforms cannot be yet assessed due to the short time period of their existance. One of the main impediments is the need of recruitment of highly qualified personnel and finalization of the structure, as well as clear differentiation of functions of the established institutions.

Environmental protection and mining inspection was established by the RA government decision N 445-N adopted on April 27, 2017. The statute of the inspectorate was approved by decision of the prime minister of the republic of Armenia No 733-L issued in 2018. The inspectorate functions under the government and exercises supervision and/or other functions prescribed by law. The Inspectorate may apply sanctions in the field of environmental protection, as well as regarding the use and reproduction of subsoil and mineral resources. Thus, the government has undertaken inspection reforms in the country aimed at establishing a more effective inspection system and creating favorable business environment. In order to ensure the transparancy of the body a Management Board consisting of representatives from the public and private sectors was formed which is authorized to carry out approval of annual programs of inspection, reports and inspection guidelines, define the objectives of the inspection for achieving strategic objectives, setting performance indicators and managing them through the identification of strategic targets and objectives aimed at their implementation and decision-making,

The decision of the Prime Minister of the Republic of Armenia N 710-A "on establishment of the Interdepartmental Commission ensuring the fulfillment of the obligations undertaken by the Republic of Armenia under the United Nations Convention on Biological Diversity, the approval of the staff and procedure of the commission" was adoted in 2016. The personal staff of the Commission was approved in accordance with the 3th paragrah of the decision N 710-A by order the RA Minister of Nature Protection N 216-A

Which national target or Aichi target is supported by this measure?

- NTs – 10, 6, 5, 4
- Aichi targets – 4, 13, 11, 10, 14

Assessment of the effectiveness of this measure

☐ The measure taken is partly effective.

Justification of the conducted evaluation

As the State Forest Committee was established in 2018, it will be possible to judg about its effectiveness later. Large sums of money have been transferred by the Environmental protection and mining inspection to the state budget in the result of inspections, visits and violations revealed in the investigation of administrative cases, including biodiversity and forests.

Inspections of mining companies, including Amolsar gold mine, Alaverdi Copper and Molybdenum Plant and etc. have been implemented.

Relevant web sites, links and files

www.arlis.am; www.gov.am; www.mnp.am; http://forestcommittee.am

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3. Development of SPNA system, improvement of management and establishment of new protected areas

Over the last decade, the total area of SPNAs in Armenia has grown to around 80,000 ha, as a result of which it currently accounts for more than 387,000 or about 13.1% of the territory of the Republic. Technical re-equipment of the territories, training management staff, extension of scientific researches and etc. is being carried out with the financial support of international organizations.

The UNDP / GEF "Catalyzing sustainable financing of SPNA system of Armenia" project plays a key role. Within the framework of the said project the programs of "Khosrov Forest" SR, "Dilijan", "Lake Arpi" and "Arevik" NP, "Zangezur" Biosphere Complex have been funded by the support of the Caucasus Nature Fund through biodiversity conservation, development of managing plans, training of specialists, replenishment of the required material needs and development of infrastructure suring 2010-2017.

works on creation of database and monitoring system in specially protected natural areas of RA were initiated by the support of GIZ within the framework of "Biodiversity Monitoring: National and international commitments" component of the "Integrated Biodiversity Management, South Caucasus" project. With the support of the World Wildlife Fund (WWF) and several other international donor organizations in "Khosrov Forest" and "Shikahogh" State Reserves, "Arevik" and "Lake Arpi" national parks and "Zangezur" State Reserve inventory and introduction of monitoring system of large mammals (Caucasian leoard, Armenian Moufflon, Bezoar Goat), as well as vulture, Armenian Viper and Darevski Viper.

"Monitoring of the Bezoar Goat Population in "Khosrov Forest" State Reserve and the Monitoring of Forest Ecosystems of the "Dilijan" National Park in "Khosrov" Forest State Reserve" project was initiated in 2016, funded by the Caucasus Wildlife Fund (CNF) and implemented by the WWF-Armenia (WWF-Armenia) Collaborating with the Ministry of Nature Protection of the Republic of Armenia.

For te purose of establishment and maintenance of cadastres of SPNAs and flora and fauna of Armenia in 2016 the RA Ministry of nature protection was provided with ArcGIS for Desktop Standard, ArcGIS for Desktop Advanced , ArcGIS 3D Analyst for

Desktop, ArcGIS Spatial Analyst for Desktop software packages for the implementation of cadastral works.

The activities aimed at the creation of protected landscape "Gnishik" are implemented by World Wildlife Fund with the support of Caucasus Wildlife Fund (CNF), which is a pilot project model for the establishment of community-managed SPNA. The draft management plan of "Gnishik" protected landscape has been developed. Activities aimed at improvement of socio-economic situation have been conducted in neighboring communities.

Within the framework of the "Support Program of SPNA system of Armenia" project financed by the German Development and Reconstruction Bank (KfW) in Syunik region, strengthening the technical capacities of Zangezur Biosphere Reserve SNCO, assessment of priority areas of 32 communities of the project area, implementation of rapid start-up activities for:

Enhancement of technical capacities of “Zangezur” biosphere complex” SNCO of Syunik marz and assessment of priority needs of the 32 communities of the project area for implementing quick launch measures were implemented within the framework of Support Programme for Protected Areas – Armenia financed by KfW

The Ministry of Nature Protection of the Republic of Armenia and Armenian branch of the World Wildlife Fund with the support of the IDeA charity fund are implementing the project of establishment of "Tatev" national park since 2015. The draft package of the RA government decree on the establishment of the “Tatev” national park (description of the borders of the national park, maps, charters, decisions of community councils) was submitted to the Ministry of Nature Protection of the Republic of Armenia in 2016.

The review of the boundaries and the program for the development of “Ijevan” and “Gandzakar” sanctuaries are being carried out by "ArmForest" SNCO and WWF-Armenia. The borders of "Erebuni" State Reserve have been revised, in order to ensure the representation of biological and landscape diversity in SPNAs. According to the Government Decree N 1119-N adopted in 2015, the reserve area has been expanded to 118.75 hectares.

The passportization of natural monuments, including natural bridge "Devil's Bridge", "Basalt organ" and "Anonymous Cave" basalts was carried out with the financial support of the Caucasus Nature Fund (CNF) and approved by decision N 276-N, adoted in 2015 and decision N 274-N, adopted in 2017 of the Minister of Nature Protection of the Republic of Armenia.

The following activities were implemented by the World Wildlife Fund Armenian branch and financed by Federal Republic of Germany through KfW Bank, including: Cartographic activities of main habitats of Caucasian leopard, gray bear, Armenian mouflon and Bezoar goat, assessment of socio-economic situation of targeted communities within the area of the eco-corridor, small grants programs were implemented in 26 Target communities in Ararat, Vayots Dzor and Syunik marzes of Armenia for residents of communities, have been completed within the framework of the project on creation of eco-corridor in southern Armenia (starting from “Khosrov Forest” State Reserve to the Islamic Republic of Iran), an environmental agreement has been prepared and signed with Khachik community, which will provide the community 12,500 Euros per year for the solution of environmental, agricultural and socio-economic issues, as well as agricultural equipment with a value of 75,000 Euros for the purpose of promoting agricultural activities. Such environmental agreements are envisaged to be concluded with the rest of the targeted communities, which are mostly adjacent to border.

Which national target or Aichi target is supported by this measure?

- NTs – 4, 5, 11
- Aichi targets –11, 12

Assessment of the effectiveness of this measure

☐ The measure taken is partly effective.

Justification of the conducted evaluation

The principles and realistic actions contributing to the development and management of the SPNAs of Armenia are expressed in the "the Strategy and State Program of Conservation and Use of Specially Protected Nature Areas of the Republic of Armenia for 2014-2020" approved by the Government of the Republic of Armenia in 2014. During the preparation of the 6th National Report, the process of implementation of the Action Plan was analyzed, as a result of it was concluded, that 14.7% of the activities have been fully implemented, 50%- partly implemented, and 35.3% -in the process of implementation. As the deadline for action is set in 2020, that teh actions partly implemented or being in the process of implementation will be finalized at that time. Moreover, after the adoption of the RA Law “on making amendments and sulements to the RA Law "on SPNAs", a number of measures set out in the SPNA-SAP may become irrelevant.

Relevant web sites, links and files

www.arlis.am; www.gov.am; www.mnp.am; www.forestcommittee.am; www.epiu.am; www.reservepark.mnp.am; www.khosrovreserve.am; www.dilijanpark.am; www.zangezurkh.am; www.sevanpark.am; www.armenia.panda.org; www.sgp.am; www.giz.de/en/worldwide/374.html; www.caucasus-naturefund.org/tag/armenia/

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4. Rehabilitation of degraded ecosystems on the example of water ecosystems

Continuous increase of Lake Sevan water level. the reduction of water level of the lake Sevan by 20m was conditioned by water abstraction for the purpose of oeration of 7 HPPs of Seven-Hrazdan Cascade. As a result, deterioration of biological and physicochemical indicators of all ecosystem components has been recorded. The lake's tropicity transformed from oligotroph to mesotroph endemic species due to changed conditions of endemic fish species, habitat and spawning areas. The endemic secies were replaced by climatised whitefish and carp.

Although Sevan's self-purification capacity is very high, but with the iflow of various types of wastewaters and garbage coming from the catchment basin and the

coastal zone, and due to high water temperatures the "blooming" of the water begins. It is a phenomenon of eutrophication in which case water quality is deteriorating and can not serve for the drinking water supply.

In order to prevent negative processes in the hydro ecosystem and to eliminate the effects, including the restoration of fish stocks, according to the RA Law on Lake Sevan, it is necessary to increase the water level by at least 6 meters.

Since 2001, the level of Lake Sevan has risen by about 3.7 meters, but the pace of restoration of the hydrecosystem is not always ensured due to exceedance of annual permissible quantity of water abstraction and related lake level fluctuations as well as unlawful fish hunting. 170 million cubic meters is the maximum limit as set in Ra Law “On Approving Annual Complex Program on the Recovery, Conservation, Recovery and Use of Lake Sevan Ecosystem”. In 2012, 2014, 2017 and 2018 water taken from the lake amounted to 320, 270, 270 and 210 million cubic meters resectively. If during 2002-2011 the level of the lake rised to an average of 42 cm per year, then the rate of increase during 2012-2018 has dropped 7 times, and the average increase amounted to 6 cm per year, while during some years only water level decrease is observed.

Not only the water resources, but also the biological components of the ecosystem, particularly fish and crayfish species, which are of great importance to the population's food security, are exploited. In the case of sustainable fishing, fish and crayfish production reserves would have been several times more. However, in fact, the spawning fish ensuring the reproduction of the species are unsparingly hunted and the population responce is the significant rejuvenation of the spawning school. The same is the situation with the crawfish population. Thus, the Ecosystem Service of Lake Sevan Food Supply is over-exploited.

Nevertheless, in recent years, there has been a tendency for growth of fish resources in Lake Sevan. In 2017, as compared with the same period of 2016, the total fish stocks increased by 16.7% amounting to 2281 tons. 921 000 young fish of Sevan trout were released in five main rivers serving as spawning areas (Karchaghbyur, Lichk, Tsakqar, Argitchi, Masrik) in 2016.

Every year, the Government of the Republic of Armenia approves “the annual program of rehabilitation, conservation, reproduction, natural development and utilization of Lake Sevan ecosystems”, which defines activities aimed at increasing the level of Lake Sevan and preserving and effective management of the resources of its catchment basin.

It is important to carry out reforestation, dismantling of buildings and infrastructures in the areas covered by the Lake Sevan, record of animal resources, including fish and crayfish, permanent monitoring and the use of permissible quantities, studying the conditions of fish reproduction in the main egg-breeding rivers, assessment and development of ways to rehabilitate them.

It should be noted that some of the annual program events are incomplete. For example, re-cultivation of lands damaged as a result of exploitation of mines in Lake Sevan catchment area, establishment of forest cover around the lake, etc. Significant violations of the conditions of endemic species of fish species are recorded due to organic pollution, construction and irrigation of small hydropower plants due to abnormally high water intake.

The program "Reconstruction of trout resources and development of fish breeding in Lake Sevan", funded by the state budget and "Recording of fish and crawfish resources of Lake Sevan and its catchment basin rivers" is aimed at evaluating the fishing, trout resources of Lake Sevan, endemic endangered species of fish, as well as the ecological state of river valleys of valuable fish species, the dangers threatening the fish species found in these rivers. The dominant species of fish in the lake is its caviar, its share in 2016. as compared with 2017 made up about 97% of the total fish stocks. Due to the ecological status of Lake Sevan and endemic fish species, the ecological status of the fishermen, Gavaraget, Lichk, Argichi, Vardenik, Karchaghbyur (Machenis) and Masrik rivers, factors that hinder natural hunting have been revealed. In general, it is too early to speak about the complete restoration of the fish community of the lake's water basin.

In 2016, Within the framework of the "Complex rehabilitation of trout resources and development of fish breeding in the Lake Sevan" the rehabilitation of trout resources

in Lake Sevan is envisaged by the creation of conditions for the natural reproduction of endemic fish, the organization of ecologically sustainable production and the development of a complete value chain. Every year, about 25% of the total amount of fodder was released into the lake. 2017 Thanks to the penetration of fish lake from damaged dams caused by ice frost in the winter, the Prince's biomass has increased to 17 tonnes. But the natural reproduction of the prince is likely to be missing. It is also worth mentioning that the preservation of Lake Sevan ecosystems is of concern to the fact that the cultivation of product fish directly on the lake ponds, as inevitably the penetration of additional organic matter into the lake.

Among the positive trends can be mentioned also the tendency of restoration of a well-developed macrophite belt in the lithosphere as a result of the increase of Lake Sevan level. Macrophyte Zone serves as a powerful biological filter for the natural self-cleaning of water ecosystems, feeding and shelter for numerous invertebrate animals, especially Gammaridae and fish. The elevation of the lake level has resulted in the improvement of the breeding birds, particularly the Big Fish Farm (Phalacrocorax carbo) and to create favorable conditions for nesting. In the basin of Lake Sevan, this type of nesting populace has reached 250. The positive dynamics of composition and number of bird species have also been observed in the Norashen Wildlife Preserve, which is included in the Sevan National Park and ITU.

Which national target or Aichi target is supported by this measure?

- NTs – 4, 5
- Aichi targets –6, 12

Assessment of the effectiveness of this measure

☐ The measure taken is partly effective.

Justification of the conducted evaluation

On the background of some positive improvements recorded in Lake Sevan, which are proven by monitoring data (continuous increase of the lake level, improvement

of water quality, increase in fish and fishery figures), there are still negative impacts on the CB. A striking example of this is the 2018 earthquake. The unprecedented "flourishing" of Lake Sevan, the main reasons for which are high water temperatures and the increase in phosphorus content in the lake as a result of human activity. The lake level fluctuations have also played a major role because of the abundance of water that exceeds the maximum annual limit of the law. Larger quantities of fishery, bird hunting, breeding of endemic species of fish, pollution of water due to lack of cleaning stations, lack of necessary scientific researches and lack of qualified specialists in the Sevan ML, etc.

Necessary scientific, technical and other needs to overcome obstacles

The abstraction exceeding the maximum permissible qauntity, regeneration of irrigation system and reduction of water loss defined by the RA Law on Lake Sevan. Construction of new reservoirs - Yeghvard reservoir, etc. Implementation of effective water management measures in the Ararat Valley, which will contribute to the continuous increase of the level of Lake Sevan in sufficient quantity of water for irrigation. Decrease in the level of water pollution in the vicinity of the lake. Planned storage of vegetation cleaning and dismantling of infrastructure in water-covered areas. Development and implementation of Sevan Management Plan. Acquisition of financial security and technical means, proper level of control.

Relevant web sites, links and files

www.arlis.am; www.armstat.am; www.mnp.am; www.epiu.am; www.sevanpark.am; www.sevanlake.am/en/the-problem-of-lake-sevan/, www.sczhe.sci.am

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5. Introduction of Climate Change Mitigation Mechanisms

The active position of the Republic of Armenia on the prevention of climate change and the unconditional execution of international commitments took place since the introduction of the CRDF. Climate change prevention activities at national level are

based on the principles of green economy and are compatible with the country's socio-economic development goals, including the restriction of greenhouse gas emissions, the use of ecosystem approach and mitigation and adaptation activities. Forecasts about ecosystems and CB situation assessment and their expected changes in changing climate are also presented in the first and third editions of the Climate Change Convention after a thorough and thorough analysis. Recognizing the importance of combating climate change, the Republic of Armenia has ratified the Dioa Correction and the Parisian Accord of the Kyoto Protocol and has envisaged the planned activities at its national level. By signing the Paris Agreement in 2015, the country committed to limiting greenhouse gas emissions within 35 years to 633 million tonnes, and felling up to 20.1%

The Government of Armenia periodically approves a list of measures to fulfill the country's obligations arising from a number of environmental conventions. Within the frameworks of the latter, the Government of the Republic of Armenia According to the Protocol N 49-8, the commitments and provisions of the CCAF and the Paris Convention for the implementation of the 2017-2021 the list of events and appoint the responsible agencies. Taking into account the importance of the implementation of these measures, Armenia continues its activities in addressing the issues of climate change in national and sectoral development policies.

It is logical that at present the activities carried out under the CRDF are primarily aimed at reducing CO2, CH4 emissions by increasing energy efficiency and using renewable energy sources. Climate change mitigation is also of less importance than the increase of carbon dioxide absorption through reforestation and reforestation. For this purpose, within the framework of the WWF / EU-funded project "Strengthening of forest ecosystems through forest transformation in Armenia to climate change" transformation of territories and planting of about 250,000 trees were carried out. Transformation of forest ecosystems is considered as a means of enhancing the natural forest resistance in the conditions of climate change and increasing the ecological value of homogeneous forests. With the support of the German International Cooperation Agency (GIZ) and the Norwegian Ministry of Foreign Affairs, About 184 hectares of forest areas were

undergone to transformation and about 130,000 trees were planted. The fight against forest pests has also been carried out on an area of about 17,000 hectares.

Taking into account the fact that the Republic of Armenia strives to achieve a level of greenhouse gas emissions by 2050 which will be neutral for ecosystems, climate change mitigation methods should focus on identifying and improving the carbon absorption capacity of ecosystems, based on modern carbon monoxide monitoring and evaluation technologies.

Which national target or Aichi target is supported by this measure?

- ԱՆԽ – 4, 11
- Aichi targets –10, 15

Assessment of the effectiveness of this measure

☐ The measure taken is effective.

Justification of the conducted evaluation

The UNFCCC and the Paris Convention provide for direct or mediated support for Armenia's ecosystem stabilization and conservation of biodiversity, the replacement of non-renewable resources at renewable energy sources, climate change and forest regeneration for carbon accumulation, combating forest fires and pests. It is important to elaborate detailed plans for climate change mitigation and adaptation for operations / investments set for Armenia, as well as to identify issues that arise with other environmental conventions and formulate agreed actions. Taking into account the multidimensional nature of the climate change problem, it is necessary to develop and clarify interdepartmental cooperation, motivated civil society participation and cooperation with international organizations.

Relevant web sites, links and files

www.arlis.am; www.mnp.am; www.forestcommittee.am; www.am.undp.org/ www.armenia.panda.org; www.sgp.am; www.giz.de/en/worldwide/374.html; www.nature-ic.am/wp-content/uploads/2013/10/3.Armenias-TNC_2015-ARM.pdf

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6. Creating preconditions for implementing green economy principles in Armenia through the use of eco-system approach and effective management of natural resources

Within the framework of the "Transition to Green Economy" initiative and introduction of the principles of green economy in the country, programs were implemented in the country, which enabled to demonstrate the possibilities of ecologically clean development in Armenia.

In 2017 The Government of Armenia has prioritized the establishment of a National Green Economy Center, which will promote the efficient use of resources and the organization of clean production by legal and natural persons (SMEs, businesses, industrial, manufacturing, farming, etc.). Creation of the National Center for Green Economy stems from the "Clean Manufacturing Concept" approved by the RA Government Decree No. 49, 2011, and is one of the conditions for the introduction of green economy in the Republic of Armenia.

The United Nations Industrial Development Organization (UNEP), United Nations Economic Commission for Europe (UNECE), United Nations Environment Program (UNEP) and the Regional Environmental Center of the United Nations (UNEP), funded by the UNIDO-funded Resource Efficiency and Clean Production (RAMA) , RAMA demonstration component is being implemented in Armenia within the framework of the "Green Economy in the Eastern Neighborhood Region" (EAP Green) initiative. The outcomes of this project, among other benefits, show the potential and benefits of reducing negative impacts on biodiversity. By improving the environmental performance and resource efficiency of targeted industry sectors, consumption and savings opportunities have been uncovered. The environmental impacts of these measures are impressive: the consumption of 696 MW of electricity, 490 m3 of water and 210 tonnes of

raw materials (waste reduction), the reduction of carbon dioxide emissions by 200 tonnes a year. All this allows companies to save up to $ 1 million a year. euro funds.

Strategic goals (2030) and mid-term targets (2022), short-term activities (2017-2020) are included in the Green Yerevan Action Plan (2017), a number of actions that promote:

1. Establishing a Clean Manufacturing Excellence Center that will be set up as a large hub for knowledge on green circular economy, clean production, efficient operational management and resource utilization.
2. The vision of "green economy" implementation is the application of an ecosystem approach through efficient management of natural resources. This vision is directly related to biodiversity conservation and reproduction issues.

Which national target or Aichi target is supported by this measure?

- NTs – 6
- Aichi targets –4, 8

Assessment of the effectiveness of this measure

- ☐ The measure taken is effective
- ☒ The measure taken is partially effective
- ☐ The measure taken is not effective
- ☐ Unknown

Justification of the conducted evaluation

Despite the steps that have been taken and planned, the measures implemented are partly effective as the results are only relevant to the results of several programs and do not have a systematic nature that makes it difficult to assess the impact of the national response.

Relevant web sites, links and files

www.arlis.am; www.mnp.am; http://www.green-economies-eap.org/; www.recp.am; www.unece.org/env/eia/about/eap_green.html; www.rec-caucasus.am; http://www.green-economies-eap.org/resources/EaPGREEN-country-note-Armenia-Jun2015.pdf; https://www.unenvironment.org/resources/report/eap-green-country-updates-series-

armenia; https://wedocs.unep.org/bitstream/handle/20.500.11822/9446/-EaP_GREEN_country_updates_series_Armenia-2015EaPGREEN-Armenia-update-spring-2015.pdf.pdf?sequence=3&amp%3BisAllowed

CHAPTER III

ASSESSMENT IMPLEMENTATION EFFICIENCY OF NATIONAL TARGETS

The information provided in the first and second chapters of this report, as well as thematic and analytical actual research and reporting data have been used to perform the tasks under this chapter.

The main emphasis was put on the information which demonstrated the changes in biodiversity development trends, changes in the phenomena causing pressure or loss of biodiversity, changes of socio-economic conditions, such as the accessibility of biodiversity and natural resources for the local population, pollution-related health issues, and other.

According to the format of preparation of the 6th National Report, 6 categories have been defined to assess the effectiveness of each national target (hereinafter referred to as the NT), with the selection and justification of one out of the six the progress achieved during the implementation of the given issue at the country level is assessed.

National Target 1: Enshrine the mechanism of monetary valuation of biodiversity and ecosystem services in the legislation of the Republic of Armenia:

The category of progress achieved during the implementation of the National Target.

v	Without significant changes.

Additional information

The importance and idea of valuation necessity of ESs has been reflected in a number of strategic programs already approved or endorsed by the Government of the Republic of Armenia envisaging actions related to the introduction of ESs and payments for them.

Including decree N 1059 of the government of the Reublic of Armenia from 2014 "on approving the strategy of the specially protected nature areas, national action plan and measures on their conservation and use" and protocol decision N54 of the government of the Republic of Armenia from 2015 "On approval of the Strategy and National Action Plan of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity". Among the activities of the abovementioned document it is planned to establish normativemethodological bases for introduction of valuation of ecosystem services during 2016-2017 and later (during 2018-2019) include the monetary value of biodiversity and ESs in the management plans of SPNAs, forestry enterprises and pastures, as well as socio-economic development programs of the marzes of the Republic of Armenia. It is assumed that payment schemes of ESs can serve for the conservation of the biodiversity through making sustainable land use experiences economically effective.

The actions envisaged under strategic documents have remained unfulfilled, which puts the implementation of the given target under risk. As a mitigating factor, it should be stated that the ideology of introducing ESs and payments for them, as well as the conceptual approaches still need to be additionally clarified and circumstantiated, in terms of in-depth study of the international experience and local peculiarities of the application of ES payments in Armenia.

Nevertheless, the need for economic or value assessment of the services provided as a result of the use of natural ecosystems or natural capital, as well as the methodology/methodological bases of the ESs assessment is not sufficiently or visibly enshrined in the current legislation of the Republic of Armenia.

For the solution of such and some other important issues the Ministry of Nature Protection of the Republic of Armenia elaborated the draft law of the Republic of Armenia "On Ecosystem Services" in 2015 containing provisions and articles regulating legal

relations related to the ESs, as well as defining the classification of ESs and methodology of their economic assessment, payments for ESs and payment terms, and financial mechanisms associated with them.

The elaboration of the draft law "on ecosystem services" of the Rebublic of Armenia derives from the execution of the assignment of the first item of the action plan for implementation of tasks stipulated in the concept of creating innovative financial mechanism in the field of nature protection developed by the RA Ministry of Nature Protection and approved by the Government Protocol decree N 47 from November 14, 2013.

Despite the importance of the issue, as a result of the discussions on the draft law at different levels it was concluded that the adoption of the draft law was premature at the given stage since it could create additional financial burdens for the users of ecosystems and it was sought appropriate to return to the issue later.

Additionally, the contradiction of interests of resources users in different sectors (forestry, agriculture, mining, tourism) and environmentalists, insufficient co-operation between different governmental and non-governmental circles and society, low level of awareness and lack of reliable and easy-to-understand information are an obstacle for the adoption of the law.The society, ES users and decision makers are entirely unaware of such functions of ecosystems or ESs are identified only with the resources available in ecosystems. As a result, ES value is not taken into account during economic evaluations and decision-making and is not reflected in the economic indicators of the country.

It should be noted that in the last five years a number of programs have been launched, which can contribute to raising awareness on ESs, as well as the introduction of that ideology on the ground.

Integrated Biodiversity Management in the South Caucasus (IBiS) programme commissioned by German Federal Ministry for Economic Cooperation and Development (BMZ) and co-funded by Austrian Development Cooperation aims to support the sustainable management of biodiversity and ecosystem services, Work on the development of cross-sectoral policies, strategies and laws in sustainable biodiversity management and ecosystem services, as well as contribute to the development and

establishment of monitoring systems for biodiversity and ecosystem services and facilitation of interministerial dialogue

Within the framework of the project, strategies and existing legal acts, including those related to ESs, are elaborated and reviewed to improve the situation for biodiversity and ecosystem management. It is also envisaged to carry out a feasibility study of pilot project on ESs payment schemes in the Republic of Armenia. This will allow revealing the possibilities of applying international experience on ESs in Armenia by identifying obstacles or impediments and their causes.

Means used to evaluate teh progress: analyses of national legislative acts, reports on national and international programs, analytical reviews, expert conclusions, and outcomes of consultations with operating entities.

Relevant web sites, web links, files

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www.arlis.am; www.mnp.am; www.giz.de/en/worldwide/20319.html

National Target 2: Define the mechanisms for the assessing biological resources and determining their use quantities; improvement of the bioresources management system:

The category of progress achieved during the implementation of the National Target.

[v] Without significant changes.

Additional information

The risks associated with the extensive use of biological resources are conditioned by the principles and and applied approaches of incorrect management that are usually based on inaccurate data related to th inventory of bioresources, scientific justifications and projections.

Due to inaccurate data of inventory and stock-taking of bioresources, lack of a clear definition of their use norms and quantities the permits issued for the use of wild plants (medicinal, edible, technical, decorative) and animals (hunting animals, fish) contain overexploitation risk of provided quantities, resulting in the risk of reduction of populations.

At present, overexploitation or non-sustainable use of biological resources is more pronounced in such vulnerable ecosystems as wetland ecosystems. Thus, whitefish resources of the Lake Sevan amounted to 27.7-30.6 thousand tons during the period of 1989-1991, while in 2005, fish stocks reduced to 0.53 thousand tons which is 20 times less. A tendency of increase in whitefish stock was observed in 2017, but it was 14 times smaller than the previously registered maximum values. The sharp decline in salmo, barbel and carp stocks, as well as industrial reserves of the crawfish (see data presented in the previous section on the state of the fish resources, aquatic invertebrates and plants). The decrease in the biological resources of the lake has also affected the well-being of the population of Gegharkunik province, especially those engaged in fishing and crawfish hunting. There is a great number of migrant workers in the region, thus the source of income for the marz is money transfers from abroad, which amounts to 11.1% per capita.

Each year, the Institute of Hydroecology and ichthyology provides information to the Ministry of Nature Protection of the Republic of Armenia on the status of various fish and crawfish resources of the Lake Sevan and maximum hunting quantity of allowed fish species. However, it is not possible to sustain sustainable fish stock at the lake due to breaches of fish species' quotas and illegal hunting. The uncontrolled water abstraction and incorrect installation of small HPPs is one of the reasons for the reduction of endemic fish species which makes it impossible for the fish to reach the egg-laying area.

Reduction of fish and crawfish resources of the Lake Sevan is conditioned by the insufficient level of environmental control, as well as imperfection of the legislative on bio-resource management and determination of muximum hunting rates. Among Armenia's aquatic ecosystems only the biological resources of the Lake Sevan are assessed and monitored.

Overuse is a threat to wild medicinal and edible plants that are in great demand by the population and are acquired through wild gatherings. Irregular and inaccurate gathering of wild edible leaf vegetables and berries leads to a considerable reduction of natural resources. During scientific expeditions conducted within the last three years a significant reduction in spinacea tetranda populations has been registered in the area of Areni community of Vayots Dzor marz.

The populations of Beta lomatogona have also been reduced due to overuse in Aragatsotn province, where in early spring, until the flourishing of the plant it is being collected by the local population for use in food.

In recent years, the number and existing threats to the Caucasian black grouse have been studied in Rhododentron scrubs of Dsegh Important Bird Area (hereinafter IBA) meadows of the upper forest border. The observations revealed that the species range is reduced as a result of overgrazing and uncontrolled gathering of Rhododentron leaves and sprouts (for making tea).

The European Union (EU) funded “European Neighborhood and Partnership Instrument (ENPI) East Countries Forest Law Enforcement and Governance (FLEG) II Program” (the “Program”) was aiming to support strengthening forest governance through enhancing their forest policy, legislation and institutional arrangements, and implementing sustainable forest management models on pilot basis.

Within the framework of the project a comparative analysis of the existing forest management practices and sustainable management of the ecosystem has been elaborated, recommendations for the sustainable management of ecosystems in the current forest management system and the formation of ESs' economic system have been developed. As a result of the analysis, a roadmap has been developed to revise legislation, policy and governance systems in the future.

Sustainable forest management, as a mechanism, is now being improved through UNECE-FAO's "Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia" project. Development of national standards on sustainable forest management has been commenced to be approved by the law which will give an opportunity to apply sustainable forest management principles. The possibility of solving

a number of key issues derives from it, including forest inventory, stocktaking and monitoring.

Within the framework of EU/WWF pilot project on "selection, mapping and assessment of high conservation values of Armenia" implemented during 2015-2016 the criteria for identifying and evaluating forests of high ecological and socio-economic values, as well as forests with biodiversity conservation values in Armenia have been developed and tested in the pilot area, which are crucial for sustainable forest management and environmental protection.

Although some improvements are recorded in terms of implementation of this National target, however, the progress made during 2014-2018 can not be considered satisfactory.

Means used to evaluate progress: State Statistical Data, reports on national and international projects, analytical reviews, expert conclusions, and outcomes of consultations with operating entities, actual data on monitoring of partial issues

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; www.sczhe.sci.am/; www.sevanpark.am; www.sevanlake.am/en/the-problem-of-lake-sevan/; www.enpi-fleg.org/activities/armenia/; www.unece.org/info/open-unece/pmt/regular-budget/1617v-accountability-systems-for-sustainable-forest-management-in-the-caucasus-and-central-asian-countries.html; wwf.panda.org/wwf_offices/armenia/news2/?286790/A-Practical-Guidelines-on-Selection-and-Separation-of-High-Conservation-Value-Forests

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Target 3: Ensure accessibility of data and information exchange on genetic resources:

The category of progress achieved during the implementation of the National Target.

v	Without significant changes

Additional information

At present, the centralized database for managing information on plant genetic resources, as national catalog is maintained and regularly updated by the Gene Bank through program developed and provided by ICARDA. It includes passport information of the samples and, in part, characterization and evaluation data. This catalog is not accessible online for scientific organizations, higher education institutions, farmers, non-governmental organizations and other stakeholders. Institutions engaged in maintanance of collections use different documenting principles and formats which significantly complicates the exchange of information. Characterization and evaluation data obtained as a result of implementation of selection and research programs are not included in databases and national and international registries, which limits their access to beneficiaries and hampers the efficient use of genetic resources.

Some progress within the framework of this issue has been registered in the forest sector. Establishment of the Forest Management Information System (NFMIS) is the first step towards making the information on the forests reliable and transparent which is a powerful data repository. The system was developed by the German Agency for International Development and is currently being tested.

The draft "procedure on data exchange and collection between the organizations engaged in maintnance of ex-situ collections of flora and fauna species" was develoed to create a mechanism for the provision and exchange of relevant data among genetic resource related information holder, scientific research and collection-keeing institutions, which is aimed at raising awareness concerning genetic resources for all beneficiaries, as well as promoting the establishment of mutually beneficial links between the institutions holding data on genetic resources.

This procedure will ensure the creation and management of a single database of exchangeable data, the sharing of information between legal entities and individuals contribute to the fulfillment of the international obligations of the Republic of Armenia and promote the development of national and international cooperation. Completed catalogs will serve as a basis for effective management of collections and ensuring data accessibility. However, the process of approval the procedure will be possible after the adoption of the RA laws "on making amendments and additions to the law of the

Republic of Armenia on the Fauna" and " on making amendments and additions to the law of the Republic of Armenia on Flora" as its legal bases have been enshrined in this in draft laws.

Means used to evaluate progress: State Statistical Data, reports on national and international projects, scientific articles, thematic researches, expert conclusions, and outcomes of consultations with operating entities.

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; http://agroecoarm.com/wp-content/uploads/Importance-of-genetic-banks-development-in-Armenia.pdf

National Target 4: Improvement of protection of biodiversity habitats by minimizing their degradation

The category of progress achieved during the implementation of the National Target.

[v]

There is some progress, but it is very slow-paced.

Additional information

It is clear, that under current conditions, the prevention of degradation of ecosystems providing services and the conservation of the biodiversity is perceived as a primary task for the country's sustainable development. The 2030 agenda for sustainable development and 17 sustainable development goals adopted by world leaders entered into force on January 1, 2016.

In Armenia, given the targets of the field under study, the key role is related to the pursuit of the following sustainable development goals (hereinafter referred to as SDG):

SDG 13 - Take urgent action to combat climate change and its impacts,

SDG 14 - Conserve and sustainably use the oceans, seas and marine resources,

SDG 15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

The following subtargets have been reviewed to analyze and evaluate progress of the 4th national target in this context, including:

1. Determine the state of the habitats in danger of distraction and the main threats that lead to degradation and fragmentation of ecosystems.
2. Assess the vulnerability of key ecosystems due to climate change paying special attention to the nature of the anthropogenic impact in most biodiversity-rich areas and issues relating to mitigation of climate change.
3. Promote biodiversity conservation and provision of ESs to the full extent through rehabilitated degraded ecosystems.

   Brief information describing the situation within the scope of these subtargets is provided below. The information is based on thematic survays, reports on national and international projects, expert conclusions, outcomes of consultations with operating entities and monitoring data.
4. According to the "Strategy and National Action Plan of the Republic of Armenia on Conservation, Protection, Reproduction and Use of Biological Diversity (BSAP) forests, water resources and pastoral biomes are at the most vulnerable and endangered state in Armenia which serve as habitat for the most of the flora and fauna species and are exposed to various pressures.

   Forest ecosystems – Armenia's forest diversity is presented by valuable representatives of 125 species of trees, 111 species of shrubs, 30 species of bushes, 48 species of hemispheres and 9 species of rugs. In general, forest species in Armenia are widespread in mountainous, lower and middle mountain belts, at the slopes of 20-25 degrees.

   According to the clarified data obtained by GIZ in 2011 through remote sensing method the forest cover of the Republic of Armenia makes 332.333 ha or 11.17 % of the total territory of Armenia, including about 283 thousand ha natural forests and about 50 thousand ha artificial forests. it was necessary to conduct field study in order

to confirm the validity of the presented data. However, in the last decades, comprehensive surveys, inventory and stocktaking of forests have not been implemented. Forest management plans are based on previously available data with inclusion of some changes. Under current conditions, all forest management plans have expired and the development of new ones is scheduled.

The comparison of the data on forest cover provided by the Forest State Monitoring Center SNCO (2016) obtained in the result of decoding of satellite imagery with Envi and ArcGIS software systems with data provided in forest management plans revealed about 20% of inaccuracies (according to forest management plans, the total area of the forests was 254842.1 hectares, while according to the results of decoding of the imagery it amonted to 203884 hectares). Insufficient state inventory and monitoring of forests and biodiversity components does not allow reporting changes in ecosystems in a promt manner and taking appropriate measures to prevent them. It is partly carried out by comparing satellite images. Monitoring of many individual components of forest ecosystems is not carried out at all.

Based on the annual reports of the State Forest Monitoring Center SNCO, the materials published by "Hayantar" SNCO, the statistical yearbooks of Armenia, and other materials the following phenomena affecting forest ecosystems can be identified:

a. **Deforestation**, still exceeding the volume of natural regeneration of the forest. Deforestation results in intensive unwanted changes in forests, including decrease of forest density, replacement of high-value species (oak, beech) with relatively low-value, yet robust hornbeam. The area of forests of the seed origin is decreasing while the area of coppice origin and secondary forests increases. In the result, such processes as fragmentation of the forests, increase of areas with wind-fallen and snow-fallen trees, landslides, avalanches, mudflows, and erosion are observed. In many parts of the country the upper limit of forest is shifting downwards, while the lower limit is shifting upwards.

In the early post-Soviet era, the negative impacts on forest ecosystems were conditioned by severe socio-economic conditions in the republic, the energy

crisis and the widespread poverty of the population. Recently, despite the anthropogenic pressures on nature due to severe social conditions have not yet been mitigated economic activity also contributes to the growth of ecosystem degradation rates, which is expressed through the use of bioresources, exploitation of mines, expansion of built environment, visible development of agriculture and tourism development.

During 2017, it was ordered to carry out harvesting of 90 596 cubic meters of wood in the forests under the control of "Hayantar" SNCO, but in reality only 29 926.5 cubic meters were harvested, including 2326.8 cubic meters of timber. In addition, 66 614 cubic meters of residual fuel-wood was provided to the residents of forest adjacent communities free of charge. Harvesting of residual fuel-wood was also carried out at "Dilijan" National Park and "Sevan" National Park SNCOs.

Overall, the volume of wood harvested by "Hayantar" SNCO for the last four years is as follows: 2014 - 29 023 cubic meters of wood, of which 1986 cubic meters of timber; 2015 - 25 977 cubic meters of wood, of which 3174 cubic meters of timber; 2016 - 25 641 cubic meters of wood, of which 2595 cubic meters of timber; and 2017 - 29 926.5 cubic meters of wood, of which 2326.8 cubic meters of timber.

Depending on the growth conditions and the tree species, the firewood can make about 65-70% of the total harvested timber, in the case of high-value species, such as oak and beech, it can be significantly higher than the average. Especially in the case of beech, the specific volume of wood is increased along to the forest density. Consequently, in sparse forests with no care activities conducted both the number of valuable tree species and the volume of the timber harvested from separat trees decrese.

The cutting ares expand in parallel to gradual reduction in the total volume of timber transported from a unit area including the most difficult, but well-preserved forest masses. Forest roads are built to reach these cutting areas, which, in turn, negativly impacts the ecosystems. The total area of the cutting areas amounted

to 1558 ha in 2014, 1501ha in 2015, 1940 ha in 2016 and 2010 ha in 2017. Thus, it became obvious that the surface of cutting areas increases. Within the period between 2014 and October 1st, 2018 10 606 cubic meters of timber and 116 980 cubic meters of fuelwood was sold out of the total harvested volume.

Timber remains the main source of fuel for the residents of forest adjacent areas. This is facilitated by the availability of timber, increased energy prices, low solvency of socially vulnerable segments of the population. As an energy resource the firewood together with the biomass constitutes 5.1% of the energy sector in Armenia, which is a great pressure on the forests.

The results of surveys conducted among the population by the State Forest Monitoring Center SNCO have revealed that the demand for fuelwood used in households exceeds the volume of timber produced from legal felling more than 20 times. Gas tariff regulation is one of the most important means to stabilize the situation. Today, the rice of a cut tree is about 30% cheaper as compared with the price of gas. A modern alternative is the replacment of fuelwood with solid fuel like pallets or briquettes. However, their import is very expensive, so it is necessary to create local production by attracting small and medium-sized businesses and encouraging them with subsidized loans.

Electricity and gas tariffs reduced in 2017 This was an exceptional case in recent decades when the tariffs have always grown. As a result, 1 cubic meter natural gas for resident customers today costs 139 AMD ($ 0.29), and for socially vulnerable (beneficiary) families - 100 drams ($ 0.21). For comparison, in 2014, the price of one cubic meter of gas was 156 AMD, and in 2007 it was 59 AMD. The price of 1 kWh of electricity is 44.98 AMD instead of the former 46.2 AMD and 34.98 AMD instead of 36.2 AMD for the night hours. As a comparison, in 2014 the cost of 1 kWh of electricity was 37.26 AMD, and in 1999 it was 20.4 AMD. The impact of such changes in energy prices on forest use will be possible to analyze only several years later.

As a scarcly forested country the export of timber from the country is of particular concern. The largest volume of timber exported from Armenia in the

last ten years was in 2016 which amountrd to 5100 cubic meters, the customs value of which amounted to $ 890,000. In 2017, the volume of timber exports amounted to 4600 cubic meters, which was realized at a more expensive price - about 1.2 million USD.

Illegal logging is a pressing problem. According to various data, it exceeds 10 to 20 times the legal cuttings. According to data of FLEG I project firewood consumption in Armenia made up 457 000 cubic meters in 2010. According to "State Forest Monitoring Center" SNCO during the period of 2017-2018, the amount of consumed firewood in the republic was evaluated to be 842 477 cubic meters. During 2013-2016, the number of illegal logging has doubled. According to the National Statistical Service of the Republic of Armenia, 179 cases of illegal logging were registered in 2013. In the next three years the number of cases has increased and amounted to 231 in 2014, 315 in 2015 and 513 in 2016.

The extensive and uncontrolled deforestation, especially in the northern parts of Armenia reflect on the animal world, in particular species composition and quantities of birds. As a result of selective cuttings (high-value oak and beech), the variety of forest species is reduced, which primarily refers to the species nesting in tree hollows, such as woodpeckers, owls, treecreepers, nuthatchs and tits. According to not regular bird observations, the quantity of accipitere gentilis has significantly decreased.

The draft protocol decision of the Government of the Republic of Armenia "on approving the the concept of introduction of a system for the prevention of illegal logging of forests with the use of cutting-edge technologies" was elaborated by the Ministry of Nature Protection of the Republic of Armenia in 2017 and is currently under discussion. It defines the principles for the creation of a system for the prevention of illegal logging and the mechanisms for targeted use of financial resources for the protection of forests using the latest technologies.

b. **Forest fires and forest pathologies:** As it is known, the criteria for assessing the degree of forest ecosystem degradation include forest areas partly or fully

destroyed by fire, areas with lost natural resistance due to pests and deseases, dying or dead forests, forest areas with no capacity of natural regrowth and completely logged forest areas. In recent years, the frequency of forest fires and the burnt areas have increased. Thus, according to official data, the volume of forest fires in 2017 exceeded 3000 hectares, which is exceeds the volume of fires recorded over the last ten years (2191 hectares). Esecially the damage caused to the "Khosrov Forest" State Reserve was extremely large. In the "Khosrov Forest" State Reserve" SNCO, according to the decoding data obtained through Seninel-2 satellite images, 1716.3 hectares were burnt down. According to a study conducted by the US Forest Service specialists, the fire mainly caused damage to juniper sparse forest and grasslands of semi-desert and mountain-steppe zones. Being predominantly surface fire, a significant damage has been caused to the surface layer of the soil by burning a layer of leaf mold and fertile soil at a certain depth. Taking into account that the region is dry, the root systems of many trees have also been supposedly damaged. Naturally, entomofauna related to the oak, junier and grass cover was also affectsed. The most affected were grasshoppers, locusts and crickets. Some of the insects were wintering, diapausing during that time of the year and were not damaged. During targeted observations conducted in 2018, it was observed that about 85% of the vegetation was restored. The process of insect recovery is conditioned by the growth of vegetation, and their number is also recovered, in particular Semanotus rusticus and anthaxia caucasica. One can expect even greater growth in their number than before, which is normal and corresponds to the well-known pattern of change in the number of insects, but this will not result in a long and stable change in the population density.

During 2017-2018 smaller fire cases were recorded in the outskirts of the Amulsar mine, in Jermuk, in the coastal areas of the Arpa River, in small areas of the "Shikahogh" State Reserve, in Hrazdan forestry branch and so on. According to the latest data, 98 forest fire cases on total area of 1169 hectares, including 617

hectares on forested and 552 hectares on non-forested areas have been recorded during 2017-2018.

Complex terrain of the area, the poor condition of the forest road network, lack of technical equipment for fires and etc. hinder the efficient implementation of the forest fire fighting activities.

Pests and diseases cause degradation of forest ecosystems as well. Based on the data of the Statistical Yearbook of Armenia, along with the increase in the volume of logging, the forest areas that have been affected by diseases and pests have also increased. In 2014, they occupied 13,900 hectares, in 2015 - 9504 hectares, in 2016 - 9400 hectares, in 2017 - 15,854 hectares, and in 2018 - 13,772 hectares of forest covered area. Measures to combat the spread of pests (especially leafy insects) and fungal diseases are scarce and basically do not include biological combat measures.

The ecological significance of the forests must predominate over its socio-economic significance taking into consideration the fact that the forests of Armenia are mountainous and have protective significance, while the demand for timber is several times higher than the forest productivity and can not be fully satisfied with the internal resources.

In this regard, the state forest management system should be viewed as a subsidized, partly self-contained non-profitable sector with a continuous investment of funds for forest protection and rehabilitation activities.

Wetland ecosystems: All the lakes, rivers, reservoirs, marshes and turf sites of the Republic are considered to be wet areas or wetland, in accordance with the definition of the "Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat"(Ramsar, 1971). Three of which, Lake Sevan, Arpi Lake and Khor Virap Wetland have the status of specially protected nature areas and are included in the list of Wetlands of International Importance of the Ramsar Convention.

In Armenia wetland areas play an important role in the conservation of biodiversity as they serve as habitat for aquatic animals and amphibians, as well as breeding or

feeding place for many bird and mammal species. Armash fishponds, Metsamor river basin, the lake Arpi, the lake Sevan and Gorayk IBAs of Armenia are basically open water and wetland ecosystems that provide habitat for large colonies of aquatic birds.

The studies carried out during the period of 2014-2018 showed that the overwhelming majority of Armenia's water ecosystems are exposed to anthropogenic factors and adverse effects of the climate change. The main reasons for the destruction of the biodiversity habitats of water ecosystems are mining, uncontrolled water abstraction for agriculture and small hydropower plants, deforestation, drying of wetlands as a result of ameliorative work, water pollution with household, agricultural wastewaters, solid household waste, which, in combination with climate warming tendencies, strengthen the degradation processes in rivers, reservoirs, marshes and lakes.

An outstanding example of this is the unprecedented "blooming" of the Lake Sevan in 2018, the main reasons for which are high water temperatures and the increase of phosphorus content in the lake as a result of human activity. The fluctuations of the water level also played a major role due to abstractions exceeding the maximum limit prescribed by annual law. At present, due to the increase of water level in Lake Sevan, new problems have emerged relating to the lack of adequate cleaning of the coastal area of the lake from the vegetation and trees, which has led to the deterioration of the quality of the lake's water.

For the complex assessment of the ecological state of Lake Sevan and its basin in 2016 two parallel projects, including "Reconstruction of trout resources and development of fish breeding in the Lake Sevan", as well as "inventory of fish and crawfish resources of Lake Sevan and its catchment basin" were implemented by the Institute of Hydroecology and Ichthyology of the National Academy of Sciences of the Republic of Armenia.

Detailed studies of Dzknaget, Gavaraget, Lichk, Argitchi, Vardenik, Makenis and Masrik rivers that are egg-laying area for the Lake Sevan and endemic species of fish were performed in the framework of the above mentioned projects. It was revealed, that organic pollution (due to effluents flowing from the pastures and dwellings), abstraction for small hydropower plants and irrigation as well as, in some cases, violation of the

natural structure of river bed are among the violating conditions of the natural egg-laying areas of endemic fish species in all rivers.

It was concluded, that the programs for the recovery of Sevan trout and salmo populations would not have a positive effect on the restoration of the quality of the habitats for these species.

The upper and middle parts of the river beds of small rivers of Armenia where uncontrolled water abstraction is being carried out become scarce or even dry out during the summer months. Changes to the aforementioned conditions are added to this leading to a decrease in the number of species with low tolerance to pollution and oxygen deficiency or to their complete extinction from the area. The rivers of Armenia with 2-3 and more HPPs, such as Yeghegis, Meghri, Martz, Qajaru and Amberd, are in a disastrous state. Thus, 17 SHPPs are being exploited in Yeghegis river basin (tributary to Arpa river), including the rivers of its catchment. On Yeghegis River itself 9 small hydropower plants are being operated. Due to poor condition of fishways of HPPs river fish can not migrate and while passing through the holes of pressure pipes, the fish dye in the turbines. Since the construction of the first HPP in 2000, the number of river fish species composition has changed so far and the number has dropped dramatically. For comparison, at present, under very small anthropogenic conditions, the state of land and water ecosystems has not changed in the upper currents of Arpa and Vorotan rivers. Water quality improvement trend has been registered at Dzknaget river of Sevan basin, at the lower stream of which waste collection was organized by Tsovagyugh community.

During construction of SHPPs, facilities are usually installed in river sections that are nesting laces or habitats for Red book species, which naturally breaks their habitats and threatens the survival of species.

Likewise, the Arpi Lake National Park has become a victim of SHPPs, where the water level of the lake has dropped due to the hydroelectric power plants operating on the Akhuryan River, and the two islands, which are habitats for the Red Pelecanus crispus and Larus armenicus, have turned into peninsulas. In the case of Shaky waterfall, as a result of the operation of the SHPP, the water does not flow into the waterfall but directly enters the generator through a pipe causing the drainage of

adjacent land. As a result, moisture-resistant plants (fern and moss species) are no longer growing in that area.

The impact of open pit mining on small rivers may lead to degradation of the river ecosystem, loss of habitats and change of species diversity, as occurred with the Akhtala and Shnogh tributaries of the Debed River basin.

The high values of the biotic index (2.8 and 10 respectively, "excellent" quality) and HN values of Shannon Wiener index registered in middle and lower streams of Shnogh River in 2014 were reduced to 2.3 and «not high» water quality values in 2017. In this case, pollution of air and water basins has led to the elimination of habitats of water animals. In the case of mining, river beds can also be modified for use in tailings or waste rock dumps.

In the recent years, some positive dynamics of the quantity and species composition of bird fauna has been observed in Sevan Basin, but the situation is totally the opposite in Ararat Valley. Annual bird counts conducted by Armenian society for the protection of birds at Armash fishponds and Metsamor river basin, revealed a disturbing Image both during nesting and wintering periods.

Particularly, in 2014, many artesian wells were closed in the Arax river valley due to irrational use of groundwater and reduction of water level. The winter observations that followed showed, that the number of birds depends on the degree of freezing of open water areas. If in recent years, open water surfaces still remained on frozen lakes due to artesian waters with large numbers of wintering birds accumulating around them, than over the past two years, open water surfaces have almost disappeared leading to a sharp decline in the number of wintering birds (Winter Waterbird Census, IWC 2017). The results of the census of wintering birds conducted in 2017 showd that more than 95% of registered birds (21 species) have been registered in the basin of the Lake Sevan, and only about 1% - 15 bird species were recorded in Armash fishponds. The same phenomenon was observed in the area of the Metsamor river system, which actually lost its important significance for wintering waterfowl species, as 90% of favorable areas of vital activity have been frozen. As a result, only 14 waterfowl bird species were registered here - about 3% of the total number (IWC 2017).

The unrestricted and irregular use of water resources of Ararat Valley Rivers and the constraction of concrete ponds by large fish farms has a negative impact on the debit of natural river flow, and the use of groundwater and natural wetlands leads to the destruction of habitats of waterfowl birds. As a result of such massive utilization of water resources by private households have created conditions for uncontrolled hunting of birds, anxiety factor and direct destruction of a large number of waterfowl birds (ASPB 2017). The numbers of ducks, that use open water surfaces, as well as of Charadriiformes and Ciconiiformes, that use the natural shores have sharply decreased.

The gray crane (Grus g Archibaldi), which is included in the Red Book of Armenia as an Endangered Species, has become an obvious victim of anthropogenic factor. In the past there were 5-6 nesting pairs in the country, while during the last two years only one has remained in the western part of the "Lake Arpi" National Park. The gray crane resides on Javakhk plateau on the border of three countries - Georgia, Armenia and Turkey. The Bird uses marshes and small lakes for nesting. Not so long ago, this species was breeding in the wetlands of Lori marz, near the town of Stepanavan (Tashir IBA). At present many marshes have been dried and used as peat extraction sites. Due to drying of habitats and partially hunting this species is facing the threat of extinction in Armenia. At present, only 1 pair of nesting gray cranes are counted in Armenia.

The loss of habitats of rivers and reservoirs cause greater damage to molluscas and larvae of dragonflies than direct destruction. Uncontrolled water abstraction puts these animals at risk, especially those that live in small reservoirs. The protection of Amphibious Asia Minor triton (Ommatotriton ophryticus) depends on the water regime and quality of little pond with a surface area of 0.1 hectares near the town of Shamlugh, as well as the reservoir near the town of Alaverdi. This species is ruthlessly hunted for sale because of its beauty. Triton's habitats are very small in Armenia, and although SPNA SAP for 2015-2016 envisaged inclusion of Lori ponds in the protected area system, it has not happened yet, so it is necessary to take steps in that direction. The situation is the same with the population of spade-footed toad (Pelobates syriacus) the protection of which is ineffective as the habitat of this species is exposed to anthropogenic impacts (groundwater extraction, water pollution, cattle grazing). It is

noteworthy that none of the P. syriacus habitats are included in the current system of Armenia's SPNAs. It is proposed to grant the status of the protected area to the habitats near Voskehat (Aragatsotn Marz) and Chiva (Vayots Dzor Marz) villages, as well to expand the territory of "Jrvezh" forest park to the area near the village of Voghjaberd in Kotayk region.

Pastoral ecosystems: In Armenia livestock breeding is one of the most important branches of agriculture due to its natural conditions and the existance of high mountainous fodder-producing areas (pastures, grasslands) that have great importance. They are also of great value in terms of biodiversity. Approximately 59% of agricultural land registered in the Republic is composed of natural fodder-producing areas that occupy about 1 244 000 hectares.

During the last 20-25 years, the total number of farm animals has dropped considerably, but degradation processes have been significantly enhanced as a result of irregular use of fodder-producing areas. Due to the lack of improvement measures of vegetation cover degradation processes have significantly increased. Pasture degradation is considered to be a widespread phenomenon in Armenia that leads to disturbance of the balance of nature and reduction in land productivity. Biological productivity has decreased 1.5-2 times as compared to the 1950s, which is a direct threat to sustainable agricultural developement and, consequently, food self-sufficiency. Hence, given the fact that is a land-poor country ensuring food self-sufficiency becomes a strategic issue.

One of the causes of loss of pasture biodiversity is overgrazing, indefinite and irregular grazing, which in many cases has led to erosion of soil, which has resulted in reduction of plant diversity. Overgrazing of the pastures has led to the change of the species composition. In particular, the number of valuable plant populations has reduced, while aggressive weeds and toxic species (such as crowfoot, thistle, euphorbia, and various types of locoweeds) have spread.

The state of the semi-desert and steppe pastures is worse, where degradation of the ecosystem has become almost irreversible. Tragacanth steppes occupy a unique

place in the mountainous steppe vegetation, where many plant species being non-edible for animals (esparcet, creeping shrub, chalk plant and others) gradually expand their territories.

Moreover, gene pool of steppes is rich with wild relatives of crops, endemic and rare species. The reserves of these species have also decreased significantly due to extensive harvesting by the population.

The efficient and well-balanced pasture management must be based upon issues concerning the improvement of their current status, protection, restoration, reduction of the vulnerability of biodiversity, and ensuring sustainable ecosystem development.

Within the framework of EU-funded and UNDP-supported Clima East Pilot Project “Sustainable management of pastures and forest in Armenia to demonstrate climate change mitigation and adaptation benefits and dividends for local communities” activities aimed at rehabilitation of degraded mountain pastures and forests were carried out. The program also envisaged activities for promoting economic benefits through capacity building and sustainable land management in local communities. One of the results of the project is the development of shift grazing plans for five target communities in Gegharkunik marz, which will contribute to the improvement of the management of 7500 hectares of pastures. Improvement of road conditions resulted in the creation of conditions for transferring large and small cattle from community pastures to remote pastures.

The goal of "Sustainable management of biodiversity, South Caucasus" (GIZ) project is to develop and test a functional model for pasture management in Armenia's communities. Within the framework of the project, a sustainable pasture management toolkit has been developed which includes pasture monitoring manual, pasture and grassland management planning guidelines. At the same time, 24 communities were trained in the field of pasture monitoring, development and implementation of management plans, monitoring of pastures was carried out and pasture management plans were developed for 19 communities. A Guideline for measures to improve degraded natural fodder producing areas- pasture and hayfields of Armenia" was elaborated and tested in the communities of Sisian region at 10.5 hectares.

"Community agricultural resources management and competitiveness" (CARMAC II) second project aims to improve productivity and sustainability of pasture and livestock systems in targeted communities and ensure growth of product volumes produced and exported in high-value agro-food value chains. The measures developed within the framework of the project are envisaged to be implemented during the period of 2015-2019. In the first phase of this project, in 2016, studies on changes in vegetation and environmental indicators in pastures of 63 communities were carried out under anthropogenic impacts of different severity.

“Platform for Sustainable Management Coordination of Natural Fodder Areas” is a joint initiative of Strategic Development Agency (SDA) within the framework of its “Livestock Development in the South of Armenia” project (funded by Swiss Agency for Cooperation and Development (SDC)), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) within the framework of its “Integrated Biodiversity Management Programme” and the Agricultural Development Fund (ADF) (implementing CARMAC II project of WB). The platform aims to ensure efficient cooperation and coordination between organizations functioning in the area of pasture management in Armenia. This will promote the viability of programs and investments in the area of cattle farming thus increasing farmers’ economic well-being and promoting rural areas’ social-economic development.

The coordination of projects directed to the management of natural fodders creates prerequisites for collaboration between relevant stakeholders and organizations and identifying and solving existing problems in order to ensure the socio-economic development of the communities and contribute to the solution of environmental issues of natural fodders.

5. **Assess vulnerability of key ecosystems due to climate change, paying special attention to the nature of the anthropogenic impact in biodiversity-rich areas and climate change issues.**

Although the main factor of the loss of biodiversity in Armenia is the loss of habitats and fragmentation (deforestation, transformation of natural landscapes for

industrial and agricultural purposes, etc.), the importance of climate change increases over the years. The assessment of climate change impacts on biodiversity is full of uncertainties, the elimination of which requires both the habitat and the knowledge of a number of criteria describing both the habitat and the organisms. Obviously, some species with high adaptive characteristics are able to withstand new climatic conditions, suppressing and extirpating less-flexible species from the ecosystem. The most vulnerable are those species that are already living in isolated /fragmented areas. Species which are under threat from human activities, such as animal grazing, will also face survival problems. In general, the impact of climate change on biodiversity at the species level can follow the following four scenarios:

1. Adaptation of specific species to unfavorable conditions and preservation of their reproduction, population size and natural distribution of the population;
2. Change of habitat (decrease or increase of distribution, upward movement) in parallel to quantitative and qualitative changes of characteristics of populations and individuals;
3. Migration of animals to other regions adjusting to new habitats due to flexibility and change of some ecological-biological characteristics;
4. Extinction - genetic properties of the species do not contribute to its adaptability (has ecological narrow amplitude and/or is breeding in specific conditions) or changes in the environment have been drastic.

An example of these scenarios is the information contained in the 3rd National Communication on Climate Change about 452 higher-class plant species included in the Armenian Red Data Book. The findings showed that probable ecosystem changes expected as a result of climate change will have a significant impact on 238 plant species, while climate change will significantly improve conditions for another 140 (these are thermophilic species; current temperatures are insufficient for them to grow more widely). Projected climate change and expected changes in ecosystems will have a negative impact on the population conditions for 74 plant species; this could lead to a sharp reduction of their habitat or even put their existence in the territory of Armenia in danger.

Therefore, climate change is first and foremost a threat to the rare plant species with narrow ecological amplitude not finding suitable habitats for them.

Climate change impacts are already tengible in Armenia. According to the estimates and forecasts of the Hydrometeorological Service of the Ministry of Emergency Situations of the Republic of Armenia, a significant increase in temperature is currently observed in Armenia. If during the period of 1929-1996 the average annual temerature increased by 0.4 °C, and during the period of 1929-2007 by 0.85 °C, than during the period of 1929-2016 it increased by 1.23°C. The precipitation reduction tendency also persists. Thus, during the period of 1935-1996 the average annual precipitation decreased by 6%, while during 1935-2016 – by 9 %.

Since the territory of Armenia is distributed between the humid Caucasian and arid Armenian-Iranian floristic regions climate change will have a different impact on the biodiversity of these regions. Aridisation of the climate will contribute to the penetration of desert and semidesert species from the arid regions of Iran and Turkey to the southern regions of Armenia (Armenian-Iranian region). This will lead to the reduction and even elimination of the areals of mesophilous species occurring in the high mountainous zone of these areas. Intensive dissemination of xerophilous species including weeds and invasive species as well as reduction of the areals of numerous mesophilous species is expected in the humid Caucasian region.

At present, studies on the distribution of biodiversity representatives, the impact of climate change on the species composition of populations are limited, which is a factor hindering the mitigation of threats. However, some experience of using modern technologies (CCSM4, GISS, HadGEM, HadGEM2-AO, GISS-E2-R, GFDL-CM3 and GFDL the use of biodynamic models of total circulation of the atmosphere) allows expanding the scientific-research works on the impact of climate change on biological species, which can serve as a basis for the creation of an early warning system in the country to promote effective biodiversity conservation measures.

Thus, assessment of vulnerability as a result of climate change and prediction of changes in the composition and structure of plant associations were carried out for respectively 11 and 22 Red Data Book species of "Relict Steppe on the Jajur Pass"

and "Plane Grove" rare ecosystems included in the Important Plant Areas of Armenia and the Emerald Network using computer modeling methods. According to the results, rare plant species (Allium rupestre Steven, Tragopogon armeniacus Kuthath. and Asperula affinis Boiss et Huet) of "Relict Steppe on the Jajur Pass" are very vulnerable to climate change and favourable growing areas for this species will be reduced in the future, while for the species Valeriana eriophylla (Ledeb.) Utkin favourable growing areas may disappear completely. While, the favourable growing areas of Red Data Book species growing in the area of "Plane grove" (Carex pendula Huds., Euonymus velutina Fisch. et C.A.Mey., Iris lineolata (Trautv.) Grossh., Lathyrus setifolius L., Platanus orientalis L., Pteridium tauricum V. Krecz. ex Grossh., Pyrus raddeana Woronow, Ranunculus cicutarius Schlecht) will be significantly reduced and even destructed.

For most of the xerophilous rare species that grow in more arid plant communities of this ecosystems, the predicted growing conditions will be improved leading to expansion their area.

Taking into account, that there are a number of other serious threats (caused by anthropogenic factors) for the flora representatives, climate change becomes more vulnerable, which can play a crucial role in the survival of species.

It is necessary to clearly understand that vulnerability forms are different for different species and, therefor, there cannot be a single strategy for reducing the risk of extinction. In a number of cases, the protection of separate species will not be possible under natural conditions, and in this case it will be required to carry out the protection in ex-situ conditions.

The impact of climate change can be more pronounced at ecosystem level in terms of positive or negative trends of ESs. The increase in the number of forest fires and pest outbreaks are consequences of aridization of climate. The high number of fires registered in 2017 was unprecedented, unlike the relative scarcity of forest fires registered during 2014-2016. It is assumed that this is due to the Global climate change scenario, which envisages deterioration of natural forest regeneration especially in the lower mountain belt (550-1200 m), where the annual precipitation

does not exceed 600 mm. Forest fires are threatening the central, southern and southeastern steppe regions of Armenia related to the expected climate aridization trends.

Due to the biological characteristics of the insects, it is projected that in case of realization of climate change scenarios massive reproduction areas of insects will expand reaching 70-75,000 ha. The most vulnerable will be the south-eastern wooded areas.

Increasing number of storms, heavy rains and hails have already resulted in the developement of erosion processes, leading to the increase of the surface of vulnerable areas exposed to landslides and mudflows that increase the risk of habitat distruction.

According to the 1st national communication on climate change the projected reduction of soil humidity by 10-30% will significantly affect the crops by decreasing their productivity. By 2030 the area and the productivity of the most valuable and yielding pasture areas of the subalpine and alpine zones will reduce by 19-22% in Armenia.

The productivity of hey filds will probably reduce by 7-10%, leading to the reduction of the fodder production volumes. Taking into account the fact that pastures will be invaded by new invasive xerophilous species (weed, thorny and poisonous plant species) and soil fertility will reduce, their biotic and abiotic composition decline in food security and income of the residents can be expected.

Climate warming will affect the formation of snow cover dependent river flows in Armenia. Generally, as compared to the baselien period of 1961-1990, the water content in the snow has already dropped by 5-10%. The water balance of Lake Sevan has suffered considerably because of the evaporation increase from the surface.

In the recent years, high temperatures, water abstraction for hydropower generation and irrigation, water scarcity, organic and inorganic contamination have intensified degradation processes in rivers, reservoirs, marshes and lakes. A good example is the widespread "blooming" of Lake Sevan with Anabaena flos-aquae eutrophic indicator in 2018 the. It was the integrated result of an abrupt increase in

water temperature (up to 24 ° C), high concentrations of phosphate and ammonium ions, and large quantities of water released from the lake.

This example shows that the effects of climate change and anthropogenic factors imact the natural ecosystems and biodiversity in a cumulative manner by activating negative processes in the environment.

The upper and middle sections of the small rivers of Armenia where uncontrolled water abstraction is being carried out become shallow or even dry out during the summer monthes. Anthropogenic hazards connected with agricultural and / or mining activities in adjacent areas are added to it leading to a decrease in the number of species with low tolerance to pollution and oxygen deficiency or to their complete extinction from the area. Such a situation has emerged in four of the nine rivers studied in the Lake Sevan basin over the past three years.

The maximum fullness of reservoirs significantly reduced in 2018 due to reduction of precipitation and snow cover by more than two times and the increase of unauthorized water discharges for small HPPs.

As of March 31, 2018 the fullness of Akhuryan reservoir amounted to 60%, Arpi reservoir- 22%, Azat reservoir- 56%, Marmarik reservoir- 33% and Aparan reservoir- 27%. Moreover, under low water conditions the coastal zone of the reservoir is drying out resulting in the distruction of aquatic vegetation and fauna species enhabiting in that assossiations. It has been found out that loss of habitats of rivers and reservoirs cause greater damage to molluscas and larvae of dragonflies than direct destruction. Uncontrolled water abstraction puts these animals at risk, especially those that live in small reservoirs.

Climate change is definitely reflected on the seasonal phenomena of birds, such as breeding and migration periods, expansion of areal and etc. A vivid example is the behavior of stork population in the villages of Surenava and Armash (Ararat province). As a result of climate change nonmigratory white storks were observed from the 1970s, the number of which has grown since 2000, and about 90% of the storks were leading sedentary lifestyle during 2014-2015. A significant part of the white storks population does not migrate from the country and has become a wintering species for

Armenia. While targeted phenological bird research has not been conducted in the country and long-term studies are needed, observations show that the species diversity and quantities of birds have undergone some changes in Armenia during 2014-2018. Currently, bird diversity has increased by 10 species and there is now estimated to be 372 bird species, 235 of which are considered nesting and 137 are migrating species. A dynamics of area change is observed in some bird species, but there is lack reliable data on climate dependence.

It should be noted that today's characteristics of newly emerging ecosystems are difficult to predict, but it is clear that they will be composed of highly adaptive and flexible communities and species. Such diverse changes naturally have a profound effect both on the state of the natural resource and the healthy lifestyle of society. The mitigation of these impacts will require increase of ecosystem resistance and the application of adaptive measures related to water and forest management, land use, food production and human health.

In order to reduce seed of the biodiversity loss, it is necessary to plan and implement measures strengthening adaptation that should have integrative nature and extend on all ecosystems, including water and forest management, agriculture and infrastructure development.

The inclusion of biodiversity-rich areas and ecosystems providing quality ESs (important plant areas, important bird areas, biodiversity hotspots, Emerald network sites, Sites containing wild relatives of cultivated crops) in the system of specially protected nature areas is one of the effective ways to minimize the negative impact of climate change on biodiversity and ecosystems.

Due to the appropriate conservation regime in sustainable SPNAs active carbon accumulation processes are maintained in ecosystems close to their natural state and having high carbon accumulation capacity (forests, wetlands, meadows) ensuring reduction of greenhouse gases in the atmosphere. SPNAs can play a role of "climatic shelters" for many animal species which in case of changing natural conditions can create new sustainable populations in the SPNAs, while the genetic material ensuring the generation of new breeding heat-resistant, drought-resistant varieties adapted to

climate change will be effectively preserved. Therefore, actions that are aimed at identifying and mapping of biodiversity-rich areas that are vulnerable to climate change, as well as their further inclusion in the protected area system are highlighted.

6. **Promote the conservation of biodiversity and the full provision of EEs through restoration of degraded ecosystems.**

   a. **Prevention of forest ecosystem degradation, reforestation.** Degradation, fragmentation, loss of forest biodiversity are among the key issues still in Armenia. The consequences of forest degradation and fragmentation are more apparent in the case of large mammals, such as the Ursus arctos, the Moon (Lynx lynx), which require extensive natural areas. In addition, forest splitting significantly reduces the quality and quantity of forest services, such as supply of water supplies, soil conservation and carbon accumulation.

   The forests are mainly located on high slopes and depending on the slopes of the slopes, the climatic conditions and the seismic situation, the landslides have been activated, the erosion-mudflow processes have increased, and the windpipe and rocky areas have increased. A significant part of the water sources and rivers has become a hazard that greatly destroys communities and agricultural land areas. By 2015, 43% of Armenia's territory is exposed to the effects of desertification.

   In Armenia, 0.1 hectare forested area is per capita, which is a fairly low indicator. It is estimated that in the environment and human well-being, an average of one person per person should fall to 0.65 hectares. In addition, there are many forests that provide a full range of ESs. Consequently, the problem of preventing and reducing forest degradation is of paramount importance to the country.

   Some steps are being taken to improve the state of the forests in international funded projects. "Implementation of Sustainable Management of Soils and Forests in Mountain Landscapes in North-Eastern Armenia" (2015-2020 UNDP-GEF) is aimed at ensuring sustainable land management and sustainable forest

management in Armenia in the north-eastern Armenia, guaranteeing a continuing process of providing a variety of ESs and promoting the importance of biodiversity protection. In 2017, the technical project of the restoration of Lalvar Forestry Forestry (Cooperative Revitalization Support) of "ArmForest" SNCO was implemented, which included 93 hectares of degraded forest lands. 260 m2 of passive solar thermal grass was built in Ardvi community, which will contribute to raising community income and reducing pressure on nearby forests. Modern equipment has been acquired for monitoring, including Go Pro cameras, GPS receivers, Arcpad, communications and more. They were provided to "ArmForest" and "Forest State Monitoring Center" SNCOs. 2018-2019 Rehabilitation of 1000 hectares of degraded forest and community pastures in Tavush and Lori marzes is underway, which will create favorable conditions for the natural growth of the forest. The dependence of the population on the reduction of firewood is that of the Small Grants Program financed by this project. Among them are:

- "The Use of Solar Energy for Energy Independence and Protection of Forests in Tavush Province" project aims to reduce the pressure on the forests in neighboring communities by using solar energy technologies. Installation of solar photovoltaic systems and water heaters will result in fire extinguishing for heating.
- "Introduction of Energy Efficient Furnaces for Protection of Forest Resources in Tavush Region" project aimed at reducing the pressure on forest ecosystems through local production and commercialization of high efficiency wood furnaces in communities of Tavush marz. As a result of the project, wooden energy efficient furnaces design, local production and commercialization are expected to reduce greenhouse grains by 30-35% annually for at least 250 beneficiary households.

The European Commission and the Austrian Development Cooperation plan for 2015-2017. has been funded by Green Energy for the sake of "green" socio-economic development. Mitigation of socio-economic difficulties in rural

communities and the population of Shirak marz, promotion of multifarious systems of renewable energy and "green" income sources.

An important step in reducing degradation of forest ecosystems is to reduce the frequency and volume of forest fires as well as to effectively combat forest pests. The solution of the problems caused by forest fires is connected with a number of organizational and technical issues, first of all, planned fire and preventive works. Among the causes of large-scale fires are the burning of plant residues by people who are banned by Armenian law and have serious fines, but the cases are culpable when the perpetrators are brought to justice. In 2017, the "Forest and Field Fires Management Program" (UNDP 2017-2020) was launched, in the framework of which forestry and field fires management policy and legal documents were revised. Improvement of capacities of communities and individual economies and introduction of technological innovations have also been implemented. It is planned to develop innovative climate solutions for climate change adaptation.

Within the framework of the 2013-2016 EU / UNDP project, "Implementation of climate change and adaptation benefits for local communities in Armenia" was implemented within the framework of the program "Strengthening of Rapid Response Capacities, Forest Pest Monitoring and Environmental Protection, Forest Reforestation works: A new 34.2 hectare new forest cover (35,000 saplings planted, including local and wild species) were established.

Sustainable forest management activities aimed at improving the state of the community of Armenia and promoting environmental features should provide for the separation of valuable sites and their management, the application of relevant regulations. Forests with high ecological value are more conservative forest ecosystems in terms of conservation and social well-being of people, whose loss can be a threat to the entire country. The use of such areas should be based on modern knowledge of forests and their activities so as to identify the most economically exploitative forest use patterns.

2015-2016 The criteria for the assessment and evaluation of high ecological, socio-economic, and biodiversity-friendly forests in Armenia were elaborated within

the framework of the implemented "Selected forests of Armenia, Mapping and Assessment of High-Volatile Trees of Armenia" (EU / WWF) "Practical Guide for Selection and Separation of Forests of High-Value Ecological Value in Armenia" (2016), which creates methodological bases for biodiversity conservation and local population for determining valuable forest areas that play a role. The standards used in the Guidelines have been tested in a pilot area of 11,465 hectares, covering forest-covered landscapes of 3 forest governors in Tavush Region.

In 2015, Armenia signed the Paris Climate Agreement pledging to limit greenhouse gas emissions within the next 35 years to 633 million tonnes and up to 20.1 per cent by 2050. Consequently, the national forest policy should be based on clear principles of sustainable forest management, measurable and clear, which will make possible the fulfillment of international commitments and requirements.

The volume of forest regeneration works in Armenia is still insignificant and according to the data of the State Statistical Service of Armenia for 2014-2016. Even during the year it has dropped. In 2014 - 57 hectares, in 2015 - 9 hectares, in 2016 - 0.5 hectares. As for forestry transporting forestry, the dynamics are the opposite. 21 hectares in 2014, 35 hectares in 2015, 58 hectares in 2016, 26 hectares in 2017. Overall, in 2004-2016, forest regeneration and afforestation activities were implemented in 3174.2 hectares, and in 2017 - on 423 hectares. According to the official website of "ArmForest" SNCO, tree-planting works were carried out at 120.3 hectares, the lion's share of which was realized by the efforts and financial resources of international organizations.

In specially protected natural areas, 2017 During the forest rehabilitation works were carried out on 23.98 hectares (nursery establishment and care, 8 hectares, planting material, including 3300 seedlings and seedlings - 58 700).

b. **Rehabilitation of aquatic ecosystems.** Access to fresh drinking water and the provision of water resources with socio-economic spheres are the most important issues for the well-being and well-being of the Armenian population.

A great role in the water balance of Armenia is provided for Lake Sevan, which is about 80% of the country's water resources, which is 5 times more than flow

water and 35 times more water. At the same time, the surface water reserves in 2016 estimated at 7.7 billion m3, underground water reserves - 4.017 billion cubic meters. m 3: Being a unique monolithic system with its unique flora and fauna, Lake Sevan ensures the ecological balance of adjacent space, mitigates the climate and is the basis of economic development. For Armenia, perhaps for the whole South Caucasus, Lake Sevan is viewed as a reservoir of freshwater, from which gravity can potentially get water from the basin. 28 rivers flow into the lake, and only the Hrazdan River lies on the lake. Consequently, the Lake Sevan ecosystem requires special attention and systematic integrated protection approaches.

The increase in the Lake Sevan level by 3.7 meters in recent years (due to the elimination of the effects of the 19.9m decrease in the lake's water level in dozens of years) had a positive impact on the restoration of fish species and other livestock habitat. An annual increase in whitefish reserves is recorded in Lake Sevan. Among the positive trends it is possible to mention the restoration of a well-developed macrophyte belt in the lithosphere as a result of the increase of Lake Sevan level. The Macrophyte Zone serves as a powerful biological filter for the natural self-cleaning of aquatic ecosystems, providing for the placement of numerous invertebrates, especially Gammaridae, for fish feed.

The elevation of the lake level has resulted in the improvement of favorable conditions for the breeding and feeding of waterfowl birds. Particularly it refers to the increase in the number of nesting poppy seeds (Phalacrocorax carbo), which was not registered in Armenia for 50 years (ASPB 2013). In the Norashen Reserve zone, which is included in the Sevan National Park and ITC, there is a positive dynamics of the number and type of birds. As the lakes in the Lake Sevan lake have been turned into crevices, a favorable habitats and a rich fodder base have been created for many watering species. The Litchk Reservoir, which includes two small lakes and their feeding river, is one of the main places in the Lake Sevan basin, where large volumes of waterfowl birds are collected. In the spring-summer period, vast grasses of water-bearing vegetation make Lichkar a favorable place for a number of bird species, such as syrups (Blackhead-duck-Aythya ferina and Red-

sealed Suzabad-Netta rufina), gallinago gallinago and Sevg bush -Tringa ochropus): However, unregulated cattle-breeding, cattle-breeding in the water direction is a constant disturbing factor and causes a loss of habitat, which hampers the process of nesting most of the birds listed above.

Currently, the pressure is high on the quality of the lake water, which is due to the decomposition of waterlogged forests and pollution of nutrients in the lake, pollution of communal household wastewater, household waste and pollution of organic and non-organic waste from livestock.

The activities aimed at improving the quality of the grass are aimed at cleaning the waterlogged areas as a result of the increase of Lake Sevan and the establishment of a new forest area near the lake, which is implemented at the expense of the state budget. Overall, in 2015-2017, 300.33 hectares of forest covered area was cleaned. For the year 2017, 83 875 million drams have been allocated from the state budget for the cleaning of 64.0 hectares of Lake Sevan lake waters by Sevan National Park SNCO. At the same time, according to the annual program of measures for restoration, conservation, reproduction, natural development and utilization of Lake Sevan ecosystems in 2017, 125,400 drams were envisaged for the cleaning of 93 hectares of forests around the lake in 2017.

To change the situation in a circadian way, it is necessary to simulate the current situation of the lake, to estimate and evaluate the consequences of the proposed changes, to present the findings to the decision makers and the public.

2018 developed and dated 23.08.18. The Government of the Republic of Armenia approved the draft law of the Republic of Armenia "On Making Additions and Amendments to the Water Code of the Republic of Armenia", which includes provisions on new approaches to water use permits for construction of SHPPs. Thus, construction of small HPPs will be prohibited in the conservation zones of specially protected natural areas, in areas adjacent to the 150 meters of natural monuments, as well as in the hydro-ecosystems

Means used to evaluate progress: state statistical data, state and international programs reports, analytical reviews, scientific articles, thematic research, expert conclusions, results of consultations with business entities, factual data monitoring of partial issues.

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; www.epiu.am; www.forestcommittee.am; forest-monitoring.am; www.armstat.am; www.mes.am; www.minagro.am; www.ramsar.org/wetland/armenia; www.sczhe.sci.am/; www.sevanlake.am/en/the-problem-of-lake-sevan/; www.wrma.am; www.dilijanpark.am; www.sevanpark.am; www.khosrovreserve.am; http://un.am/en/p/sdgs-and-armenia; www.un.am/up/file/SDGs_Targets_Indicators_ARMENIAN_FINALIZED.pdf; http://mes.am/hy/meteo-reports/; www.scws.am; www.abcc-am.org/projects.html; www.iucn.org/content/armenian-society-protection-birds-becomes-first-iucn-member-armenia; www.climaeast.eu/clima-east-activities/pilot-projects/pilot-project-in-armenia; www.arspiu.com/CARMAC-II-PROJECT.55.0.html?&L=0%20Environmental%20Compliance%20Manager; www.giz.de/en/worldwide/20319.html; http://www.nature-ic.am/wp-content/uploads/2013/10/3.Armenias-TNC_2015-ARM.pdf; http://www.nature-ic.am/Content/announcements/7345/First-National-Report_resume_Arm1.pdf; www.sgp.am/en/Projects?id=91; http://agtc.am/wp-content/uploads/2016/08/645_Community-Needs-Assessment-Report_11.05.2016_FINAL_ENG.pdf; www.am.undp.org/content/armenia/en/home/operations/projects/environment_and_energy/mainstreaming-sustainable-land-and-forest-management-in-mountain.html; www.am.undp.org/content/armenia/en/home/projects/addressing-climate-change-impact-through-enhanced-capacity-for-w.html; www.am.undp.org/content/dam/armenia/docs/5195_ARMEU_Clima%20East_UNDP%20ProDoc_arm_final_28%2005%202013_full.pdf; www.enpi-fleg.org/site/assets/files/2174/practical_guide_on_hcvfs_armenia.pdf; www.sgp.am/am/Projects?id=60; www.aspired.wadi-mea.com/hy/%D5%AE%D6%80%D5%A1%D5%A3%D6%80%D5%AB-aspired/ eeas.europa.eu/delegations/armenia/48439/eu-supports-sustainable-economic-development-rural-mountainous-areas-armenia_en

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Reliability of the evaluation level

☐ based on partial data

Interpretation of the reliability level

It bases on used representation, coverage, accuracy of used information and in some cases, data defficensy.

Monitoring data adequacy for assessment assistance

☐ the monitoring of the given NT is not complete; only a part of the area or problem is involved.

National Target 5: Enhance in-situ and ex-situ conservation of the biological diversity

The category of progress achieved during the implementation of the National target

☐ v Foster towards implementation process.

Additional information

In-situ conservation of biodiversity in Armenia is carried out in specially protected natural areas (hereinafter referred to as ESIA), where about 60-70% of flora and fauna species are concentrated, including the vast majority of endemic, endangered and endangered species. It also emphasizes the importance of ecosystems and biodiversity conservation in protected areas (hereinafter referred to as CBSA), Important Biomedical Areas (hereinafter referred to as IDPs), Important Bird Areas (hereinafter referred to as ITU), Emerald Network Sites, Hotspots for Biodiversity, , ecosystems and animal migration routes.

1. **To develop and expand the SPNAs system for the full range of landscape and ecosystems and the full range of species included in the Red Book of Armenia, to improve the management of the environment and financial sustainability, to create the**

key environmental and socio-economic bases of the ecological network and to implement appropriate pilot projects.

The maintenance and development of the existing system of SPOs is an important component of Armenia's environmental policy implementation, as well as the most important component of the country's sustainable and long-term development. All Armenia's protected areas are managed by government agencies and occupy 387084.4 hectares, or 13.1% of the country's total area (including the mirror of Lake Sevan). After the adoption of the CRP Strategic Plan after 2009, the total area of protected areas increased by 88.6 thousand hectares.

The effective functioning of ESDs hampers the fact that most of the protected areas lack complete data on biodiversity. The species included in the Red Book of Armenia were mainly studied. Of the 452 species of plant species registered in the Red Data Book, 166 (36.7%) of the high-grade herbs are listed in the Red Data Book, 40 of the mushroom herb types (82.5%), 95 (61.3%) of the 155 species of vertebrae, 153 of the vertebrates 96 (62.7%).

The representation of different types of ecosystems / landscapes in the system of SPOs formed in Armenia is very uneven. Semi-desert, steppe, meadow ecosystems with rich biodiversity, important and anthropogenic in terms of biodiversity and landscape protection for Armenia are not fully included in the rich mountainous areas of cultivated plants. Thus, the BOTA system mainly includes forest (28.5% of the protected areas) and waterfall landscapes (almost 33%, the Saki River occupies a great place in the Sevan accordora), whereas, for example, desert-semi-desert landscapes comprise the total area of protected areas 0.2%.

In order to solve these problems, it is necessary to create new protected areas, which is fixed in the SPS-STP. With the support of the Armenian Nature Protection Ministry and the World Wide Fund for Nature (WWF-Armenia), with the support of the IDeA charity fund, starting from 2015, the Tatev National Park is being implemented. 2016 The package of the draft decision of the Government of the Republic of Armenia on the establishment of Tatev National Park has been submitted to the Ministry of Nature Protection of Armenia. "ArmForest" SNCO, WWF-Armenia, is implementing the Border

Reconstruction and Capacity Development Program of Ijevan and Gandzakar. It is envisaged to create "Ijevan Forest" Sanctuary in Tavush Region of Armenia as a result of the review and optimization of the borders of three existing forest sanctuaries (Ijevan, Gandzakar and Araratklein). In order to ensure biological and landscape diversity, the borders of the "Erebuni" State Reserve have been revised. By the decision of the Government of the Republic of Armenia N 1119-N of 2015, the reserve area has expanded to 118.75 hectares. Works are under way to eradicate the borders of the "Khosrov Forest" State Reserve and expand the area. 2016 A Memorandum of Understanding was signed between the Ministry of Nature Protection of Armenia and Lydian Armenia CJSC for the establishment of the Jermuk National Park, which envisages the establishment of a new "Jermuk" national park on the basis of the Jermuk Hydrological State Reserve. The Memorandum of Understanding is aimed at maintaining biodiversity, developing ecotourism and improving the socio-economic situation of adjacent communities, and ensuring sustainable development of the Jermuk national park.

It should be noted that the activities initiated for the creation of new protected areas can not meet the needs of Aychi's 11th Targeted Objective until 2020. the protected areas in each country occupy 17% of the total area. In the long run, Armenia needs to expand the number of protected areas at the expense of vulnerable and important water ecosystems, such as the habitats of the Armenian Red Book in the Metsamor River Basin, the water and land habitats near the villages of Voskehat (Aragatsotn Marz) and Chiva (Vayots Dzor marz) Lori ponds, ROCs and biodiversity hotspots.

All the EMPs in Armenia are governed by state institutions, with the principles of vertical and vertical governance and with deficiencies in it. The lack of this model, the lack of technical and financial resources, hinders the strengthening of ties and coordination between different levels of the SPS management system. 2018 Since January all management of SPOs has been entrusted to one authorized state body, represented by the Ministry of Nature Protection.

According to contemporary principles of the activities of SPOs, on the basis of the equal development of environmental and socio-economic programs during their creation

and management, active participation of not only the state, but also society in a number of directions should be ensured: support for the ecosystem self-regulation, sustainable utilization, participatory and community models, compensation and incentive schemes, economic mechanisms and different financial sources utilization, fair distribution of incomes, creation of a national ecological network to support the natural state of nature and people's sustainable living.

Starting from 2015, works are under way to create a community-managed first protected area. The pilot model of the project was the creation of a protected landscape "Gnishik" in Vayots Dzor province, which is implemented by WWF-Armenia with the support of the Caucasus Wildlife Fund (CNF). The "Gnishik" protected landscape management plan has been developed. A number of socio-economic and capacity-building programs have been implemented in Areni and Khachik communities in its conservation area.

The existence of a management plan for ESDs is a primary issue for the effective management of different categories of SPOs. 2015 The Environmental Protection Ministry's N 392-A decree approved some new provisions for reviewing the management plans for SPOs, in particular, the exemplary structure of subprojects included in management plans - operational, maintenance, scientific research, monitoring, ecotourism and visitor service, ecological education and awareness, zoning and other subprojects.

In 2016, the Khosrov Forest State Forest Management Plan Development Plan was launched, funded by the Caucasus Nature Fund and implemented by WWF-Armenia in collaboration with the Ministry of Nature Protection.

In 2017, the Government of the Republic of Armenia approved the Government Decision No. 190-N of the "Dilijan" National Park for 2017-2026 and approved the first priority measures to be taken to manage the project financed by the Caucasus Wildlife Fund (CNF).

In the frames of the "Conservation Area Support Program-Armenia" funded by the German Development and Reconstruction Bank (KfW), it is envisaged to carry out the

development of the management plans for protected areas under the subordination of "Zangezur Biosphere Complex" SNCO.

Negotiations are under way with a number of international environmental organizations to acquire grants for the development of management parks and national parks management plans.

2014 year By the orders of the Minister of Nature Protection, passports of nine monuments of Lori region and 15 nature monuments of Tavush province were approved, and in 2015-2018 - 7 more. In general, the nature of the monument in Armenia was defined for 232 objects, the number of statutory monuments, 31.

The creation of the national ecological network is carried out within the framework of the "Creation of Ecological Corridors between Protected Areas" funded by the German Development and Reconstruction Bank (KfW). WWF-Armenia has completed the mapping works of Caucasian leopards, gray bear, Armenian moufflon and Bezoar goat residences in southern Armenia (beginning with the Khosrov Forest State Reserve on the border with the Islamic Republic of Iran). The mapping of the targets within the eco assessment of socio-economic situation of communities. Several small grants programs have been implemented in 26 target communities in Ararat, Vayots Dzor and Syunik marzes of Armenia. An environmental treaty has been signed with the Khachik community for the purpose of resolving environmental, agricultural and socio-economic issues in the course of ten years. The community will be provided with financial assistance and rural equipment every year to stimulate agricultural activities. Such environmental agreements are envisaged to conclude with other targeted communities, mostly borderline.

With the financial support of the German International Cooperation Agency (GIZ), the creation of a database and monitoring system in the PAs has been launched within the framework of the Integrated Biodiversity Management in the South Caucasus program.

In the "Khosrov Forest", "Shikahogh" Reserves, "Arevik" and "Arpi Lich" national parks, with the support of the World Wildlife Fund and several other international donor organizations in the Zangezur State Reserve, large mammals (Caucasian Puddle,

Armenian Moufflon, Bezoar goat), vulture, Armenian vine, Darevski viper registration and monitoring system.

In recent years, the creation of national parks has had a positive effect on birdwatching. Thus, the establishment of Arpi Lake National Park, located in the north-western part of Armenia, was of great importance for nesting and non-wetted bird species. Thanks to the creation of the Arevik national dance, the condition of the hogs has improved, and the number of population of the Ugar-Tetraogallus caspius and the Caucasian Marine-Lyrurus mlokosiewiczi stabilized. Additionally, there are forest birds such as Small Eagle - Clanga pomarina, Cretaceous - Pernis apivorus, Aquarius - Aquila chrysaetos, Beetle Vulture - Gypaetus barbatus, Sapans - Falco peregrinus.

In recent years the number of Black Vulture - Aegypius monachus has grown and the unique nesting population has been preserved in "Khosrov Forest" Reserve. Over the past decade, environmental events have helped boost the growth of black vulture and bring it up to 14 pairs.

In 2016, the monitoring of the Bezoar goat population in the Khosrov Forest State Reserve and the Monitoring of Forest Ecosystems of the Dilijan National Park in Khosrov Forest Reserve, funded by the Caucasus Natural Foundation (CNF), is being implemented by the WWF- Armenia, in collaboration with the Ministry of Nature Protection.

ESRI has provided ArcGIS for Desktop Standard, ArcGIS for Desktop Advanced, ArcGIS 3D Analyst for Desktop, and ArcGIS Spatial Analyst for Desktop software for the creation and maintenance of Armenia's flora and fauna cadastres in 2016. Negotiations are under way with a number of international environmental organizations in order to provide information bank creation and maintenance of cadastre in the PAs.

The Real Estate Cadastre Committee of the Republic of Armenia has implemented the Armenian Real Estate Information System (ARPIS) since 2012, through which the functions of state registration and provision of information on real estate rights and restrictions are implemented. The committee has expressed readiness to organize free trainings for ARPIS in 2018.

In order to ensure effective management of protected areas, it is necessary to address the issue of sustainable and targeted financing of land protection. The GEF / UNDP Sustainable Financial Stability Stabilization Program in Armenia (2009-2017) aims to strengthen long-term financial sustainability of Armenia's protected areas within the framework of the Inter-Agency Financial and Technical Cooperation Agreement between the Government of the Republic of Armenia and the support of international and donor organizations, The Nature Fund is developing and concluding grant contracts to provide financial assistance to the PAs.

Biodiversity conservation measures are being funded through Funding Assistance Programs, management plans are being developed, specialist trainings are organized, and material and technical resources are provided. Only in 2018, the CBF has invested about 950,000 euros in the introduction of contemporary, innovative technologies and solutions for management and conservation in protected areas, promoting eco-tourism development and biodiversity monitoring. The "Khosrov Forest Reserve" SNCO Assistance Program "(2015-2017) provides financial resources for the implementation of key functions in the protected area, increase of salaries, acquisition of technical equipment and anti-fire equipment, tourism programs, monitoring and public awareness. The financial resources of the Dilijan National Park SNCO Assistance Program (2016-2018) are provided through the development of a long-term national park plan, park zoning, biodiversity monitoring, tourism and recreational development, as well as professional training, encouragement of staff, required material-technical needs for replenishment. The financial resources of the Arpi National Park SNCO Assistance Program (2016-2018) are provided for national park construction, procurement of vehicles and equipment, vocational training, and encouragement of staff. The financial resources of the Zangezur Biosphere Reserve SNCO Grant Agreement (2014-2017) are provided to support operational costs, vocational training, SNCO employees, and replenish the required material and technical needs.

Obviously, the long-term management of SPOs requires more spending than income opportunities. Economic benefits that can be directly or indirectly, permanent or at one

time can be obtained from the effective management of the SMEs. Examples of economic benefits can be tourism and regulated recreation.

With the financial support of WWF-Armenia and the Transboundary Joint Secretariat (TJS), the Eco-Tourism Development and Marketing Guidelines have been developed in the SPOs and adjacent areas.

In 2016, the creation of an Information Center for Ecotourism has begun in the State Museum of Nature in SNCO, with the aim of providing relevant information to Armenia's tourists. The center is fully furnished, there are maps of patents, brochures, travel guides and other supplies for ecotourism.

By the instruction of the Minister of Nature Protection of RA, the draft version of the "Ecotourism Development Concept in Armenia" has been presented to the ministry's subdivisions for discussing existing problems, ways of solution, development possibilities, necessary financial resources and vision. Based on comments made on the project, the draft will be elaborated and submitted as a complete document.

WWF-Armenia has completed the construction of a 10 hectare shelter for the Caucasian noble deer in the territory of Dilijan National Park, which will also serve as a tourist destination. The construction of the deer storage and distribution center (including the Information Center) has begun.

Staff training and retraining activities have been implemented in all reserves and national parks, seminars, and practical training for monitoring. For the development of capacities, PSAs were equipped with the necessary equipment, trucks, computers, and more. Population awareness raising activities were carried out in the communities adjacent to the ESD.

Biodiversity In-situ conservation issues are addressed through the Convention on the Conservation of Wildlife and Conservation of Europe (Berne, 1979) through the separation of Emerald Network Sites of Special Areas of Interest. Determination and separation of such sites is intended to create a universal network for the protection of the European area through special protection regimes to mitigate the threats to wildlife and animal species. 2013 The "Emerald Network-Phase II" program was launched in Armenia, which was aimed at finalizing the network. Currently, all the potential areas

previously proposed have been evaluated and reviewed and 23 territories have been separated. Specified in accordance with the requirements of the 4th Bern Convention Convention, the habitats included in the potential areas of the Emerald Network in Armenia, and species and plant species according to Article 6. 2018 23 territories offered from Armenia occupy 1033719.5 hectares (34.7% of the territory of the country) and include 1 State Reserve - "Khosrov Forest", 4 national parks, 4 sanctuaries, 8 CLS, planned "Jermuk" and "Tatev" national sacks, 4 territories that have no preservation status, 65 of Armenia's habitats included in the 4th Bern Convention, species listed in Article 6 of the Berne Convention in Armenia 148 species, including venomous plants -8 species, invertebrates -8 species, reptiles -3, birds -109 species, milk sunner- 6 species. The CBD decision and separation in Armenia was carried out in 2010-2012 for the implementation of the Global Plant Protection Requirements of the Convention on Biological Diversity, during which, taking into account the International Criteria Decision Making Criteria, 18 SEEs were separated in the country.

ITU is an area of international importance that covers a significant part of the entire population of one or several bird species. The decision and separation of ICTs is a targeted task of a major international program proposed by BirdLife International. IBAs are areas where birds are nesting, wintering and hawking. They can be of varying sizes ranging from several thousand hectares to hundreds of thousands of hectares, may not have the status of protected area. There are 18 ITCs in Armenia, 12 of which are connected with forest landscapes.

The maximum inclusion of the species registered in the Red Book, out of the system of SPOs, is an important issue in the PES system. Taking into account the existing biodiversity representation in Armenia's POPs and the locations of the species registered in the Red Book of Armenia outside the BOTA system, a number of distinctive areas with concentrated doses and biodiversity considerations are appropriate for the future to include in the PES. It is noteworthy that such collections have appeared in the territories of the Republic where there are no PAPs, which makes it more relevant to the necessity of their creation. In the future, the existence of such a system of Armenia's security systems will not only ensure the maximum inclusion of the species registered in the Red Book of Armenia and the integrity of

ecosystems, but will also create grounds for the establishment of a national ecological network.

2. Improve the ex situ conservation of biodiversity through the expansion of gene pools and other collections, the creation of wildlife and plant breeding economies, and applying relevant technologies.

The protection of agro-biodiversity, which is of major importance to the country, is the main target of biodiversity ex-situ conservation. It aims to create genetic diversity for the species, varieties and genetic material reproduction beyond the natural environment that will provide a stable amount of genetic resources and a quality close to its natural state.

The "Sustainable Development Strategy of the RA 2010-2020 for Agriculture and Sustainable Development" has defined the main directions of the state agrarian policy. One of the priorities of the breeding industry is the development of horticulture, the creation of intensive orchard gardens, preservation of cultivated and wild genetic resources, preservation and sustainable use of genetic resources of agricultural crops and their native species.

More detailed information on nutritional and plant genetic resources and species preserved in the gene pools for food and agriculture in the field of conservation and use of plant genetic resources is presented in the description of the 8th Target Task.

Establishment of wildlife and plant breeding farms and their promotion aims to ensure the recovery and reproduction of wildlife and animal species on the verge of extinction, the afforestation of the flora and fauna and the landscaping of the settlements, as well as the export of socio-economic and cultivated species sale.

Thus, in 2015, a botanical garden was established in the Yerevan Botanical Garden for the purpose of growing rare and endangered forests, and in the future the seedlings were re-launched in the natural forest areas of Armenia within the framework of the WWF-Switzerland-funded program. The Armenian Tree Project has 4 modern nurseries in the area of 18 hectares of nurseries, which include ornamental, evergreen, up to 50 species of trees, up to 200,000 seedlings in which there are also trees registered in the Red Book of Armenia. Their repatriation is being organized around 70 locations in Armenia, community centers, schools, churches and hundreds of villages. In the

Caucasus Wildlife Refuge nursery of Urtsadzor, seedlings are grown from seeds harvested from wild endemic breeds, which provide biodiversity fertility during their reproduction.

Artificial breeding of forestry workers is carried out in a number of public and private nurseries, for example, in the hothouse belonging to Hayantar SNCO in Hrazdan, the planting material is grown by a closed root system, which provides higher levels of adhesion compared to conventional weather.

Within the framework of the project implemented by the Scientific Research Center of Grape orchardry of the Armenian Ministry of Education and Science in 2016, In the farmhouse of Aygavan village of Ararat region, a nursery was established, with about 195 grape varieties, clays and forms. The small nursery was also established in the Merzavan community farmhouse of the Echmiadzin region of Armavir marz with about 15 varieties.

The programs funded by the Center for Agroecotechnology of the National Agrarian University of Armenia are aimed at ensuring rapid and mass production of healthy plants, valuable varieties of agricultural crops, ornamental and medicinal herbs, using biotechnological methods. As a result of the fundraising projects, around 30 varieties of potato seeds were obtained from virgin planting material, 10 traditional varieties of grape were recovered, gradually being drawn from cultivation and currently encountered in the form of separate vases.

Ex-situ conservation of animals takes place in several directions. The most developed fish breeding, which is widely spread in the republic and has a great economic significance. Mainly in the natural and artificial reservoirs of Armavir and Ararat provinces, sturgeon, hawkish, rainbow trout, lumber, Sevan's princes (gull, summer boards) are kept and multiplied. The objective of the Comprehensive Rehabilitation and Recovery Program of the Lake Sevan is to rehabilitate the trout resources in Lake Sevan, which is being used to grow endemic chickpea in the cellars and relocate a certain amount of lake in the lake. In Karchaghbyur community of Gegharkunik region, Sevan Trout CJSC has established a fish-breeding complex for the production of

blackberries. According to the approved program, the Foundation annually lets 25% of the total amount of produced fruits.

The endemic fish, lush and beech stocks of Lake Sevan have dropped sharply due to the almost complete destruction of the hatcheries in the upper streams. Breastfeeding is especially important as it is a factor that restrains eutrophication in Lake Sevan. Within the framework of the 2018-2023 Action Plan on the Sevan National Park Reform and Development Strategy, The Ministry of Nature Protection has initiated a preliminary study for the backbone program, financed by the state budget and other funds not prohibited by law.

In the territory of the Dilijan National Park, the "Caucasian Beetle Breeding Center" was created for the restoration of the animal population. 2018 In March, two of the three deer brought from Iran to Armenia were heroes, one of them. The transfer of the next group of deer to Armenia is scheduled for the second half of 2018. 2018 In June, the first baby was born in the center. Financial supporters of the project are the Federal Republic of Germany, KfW Development Bank, WWF Germany, Caucasus Natural Resources Foundation (CNF), Transboundary Joint Secretariat (TJS) and HSBC Bank Armenia.

From 2017, the Center for Rare and Avoiding Reptiles has been established within the framework of the agreement between the Zoology and Hydroecology Scientific Center of the National Academy of Sciences of Armenia and the US Petroleum Zoo, which envisages further rehabilitation of reptile populations by reintroduction.

2017 The RA Governmental Decree N 53 approved the programs "Creation and Development of Beef Cattle and Sheep Rams, Semi-Coronal Cordial Type and Mutton Breed Breeders in Armenia", which will allow to receive high-purity and productive breeding animals, breeding farms.

In the Scientific Center of Zoology and Hydroecology of the National Academy of Sciences of Armenia for the preservation and reproduction of rare and endangered animals, hybrid populations of moufflon and sheep have been created, an artificial reproduction of pomegranate artery (Porphirophora hamelii Brandt), which can serve as a basis for the use of species operation. 2018 "Vordan Karmir: The United Nations Educational, Scientific and Cultural Organization, UNESCO, has been named as

"Safeguarding of the Armenian Cochineal, Transmission of Knowledge, Skills and Practices Related to it" to evaluate the use.

The other promising species in Armenia is Cultivated Silk, Sheram, which was imported to Armenia in the VI-VIII centuries. Until the 80's of the last century, Armenia has been implementing livestock plants. Now, individual entrepreneurs are again interested in this insect and its wicker. Even an experimental design of an armored helmet was created. However, the importance of the issue at the state level has not yet been met.

3. Identify and classify alien wildlife, evaluate their current state, identify threats to important natural ecosystems, penetration paths and migration controls.

As a result of the activity of wild-growing plants and animals, as well as microorganisms, the penetration of natural compounds is a biological contamination, the consequences of which, unlike other influences, are almost irreversible. Many extraterrestrial species are characterized by high adaptability that allows them to break into new ecosystems. The rapid increase in the multiplicity dramatically increases their number, which results in the pressure of the aboriginal species or their extraction.

Recent studies in Armenia have revealed that the density of populations of invasive species has risen. Due to the invasion of extraterrestrial species, natural variations occur in species composition of biodiversity, the types of aborigine are removed from their natural habitats. According to scientific findings, anthropogenic transformation of the territories and temperature increase trends contribute to the penetration of alien species.

Different ecosystems in Armenia are the presence of undeveloped, abandoned land plots that cause the spread of alien species and their prevalence, favorable conditions for their rapid reproduction, in many cases the impact of climate change and the lack of monitoring and control systems. The factors that hinder the mitigation and / or mitigation of threats are the absence of both economic and environmental assessments of damage, and the lack of planned strategies to counteract the exploitation of alien species.

Since 1960 the number of Armenian fish has grown from 24 to 40 species. 2010 For the first time in the Lake Sevan, invasive Armenian herbal teeth (Alburnoides bipunctatus

armeniensis) and Pseudorasbora parva were found. Caracius auratus (Cyprinus carpio) was exposed in the 20th century. These species are the fodder rivals of endemic species of fish. However, the ruler feeds on the fishes and their fish in the Lake Sevan. Thus, randomly imported fish species have both positive and negative effects on the ecosystem. Almost all the rivers in Sevan catchment basin have been identified by the tailgate, which has become a dominant species and occupies the ecological niche of the beech and side-by-side river and gravel forms. In the fish farms operating in the catchment basin of Lake Sevan, the rainbow trout (Parasalmo mikissa) is breeding or keeping in contact with endemic fish in the event of penetration into the Lake Sevan or basin rivers.

Araks River in 2012 Three new species of fish, Rutilus caspicus, Blicca bjoerkna transcaucasica and Sander lucioperca were registered for Armenia. From 2014 to 2014, At the top of the Meghri River flowing through the Arevik national park. met with the Transcaucasian Guard and Sudan. The penetration of Caspian crust and Transcaucasian goucer species to the Metsamor River or the Akhuryan reservoir of the Arax River basin can lead to the cross-breeding of the endemics of Armenia, the Armenian gusher (Blicca bjoerkna derjavini) and the Armenian Rutilus schelukovnikovi. It is necessary to grant the status of the protected area to the main habitats of the Armenian reptile in the Metsamor River and to the hunting grounds.

2017 For the first time in the waters of Armenia was found a type of Anguilla anguilla. It is supposed that the water from the Caspian Sea has been penetrated independently of Armenia.

Most of the water ecosystems of Armenia have been experiencing significant quantitative and qualitative changes over the past few decades, resulting in a change in the quality of fish feeds along with increased biodiversity. Local species often yield their productive significance to species such as silver shingles, lilacs, and other species. For example, in the 70's of the 20th century, only seven species of fish lived in the Aghstev and Debed River basins of Northern Armenia. Later in 1990-2005, Studies have shown that fish diversity has changed, reaching up to 13 species, and by 2017. Studies have shown that the number of fish has grown to up to 19 species. The reason for this is the

accidental penetration of fish imported by private small-scale farms, or the spread of new species of fish by amateur fishing people, which are not typical for rivers. It should be noted that the number of habitats of valuable fish species (Salmo trutta, Salmo caspius, Capoeta capoeta, etc.) in the rivers has been reduced due to illegal fishing, exploitation of small HPPs, pollution by household wastewater and agricultural use.

Due to the expansion of trade areas, the beneficial conditions are created both for invasive and some local species. So, in 2016, Harmonia axyridis Pall: Northwestern part of Armenia registered (Coleoptera, Coccinellidae), whose pathways are not known. It is assumed that this happened through the import of fruits from Georgia. Now the beetle is spreading rapidly in Armenia. 2018 According to the observations it has been found in the central and southern regions of Armenia (Lake Sevan, Goravan, Noravank). 2018 A massive type of flare has been registered around the Teghut deposit. Thus, it has been reported that this type of dissipation is rapidly spreading.

The necessity and possible remedies for the prevention and treatment of invasive species have not yet been properly understood at different levels, including within the decision-makers. To some extent, customs checkpoints are intercepted only by quarantine and agricultural parasites.

The list of quarantine insects in Armenia includes 8 species, and the number of missing but anticipated insects is 8 species for protected products, and 7 species of potentially hazardous quarantine pests of greenhouse plants. Each year, by the order of the Food Safety Inspectorate of Armenia, provincial inspectors carry out a phytosanitary monitoring throughout the country, with around 6,000 sampling and laboratory examinations. In case of detection of new quarantine habitats of harmful organisms, the Government of Armenia is announcing quarantine, deteriorating the area of infected organisms and the Ministry of Agriculture of Armenia undertakes measures to combat these pests.

In recent years, the results of the research on the primary assessment and dissemination of invasive and expansive plants by Armenian botanists have shown a significant increase in the range of spreads of certain species and the increase of their

population density. The most aggressive is the spread of aggressive species, 38 of which have already penetrated the natural ecosystems and threaten local herbal diversity.

The study of invasive and expansive most intoxicating and dangerous plants in the Armenian Botanical Institute is aimed at evaluating and modeling their further distribution in Armenia, as well as evaluating the dangers for natural ecosystems and offering control measures. In 2015, as a new breed in Armenia, Grindelia squarrosa (Pursh) Dunal, which has been invaded in the United States and South America, has invaded the Balkan Peninsula, the Baltic States, the Pre-Caspian, and South Asia and is considered an invasive species for Armenia. Redberries Clematis vitalba have been demonstrating invasive potential in recent years, spreading rapidly in the Ijevan region. These two species should be included in the list of plant invasive species of Armenia.

From January 1, 2018, the Council of the Eurasian Economic Commission has come into force on the establishment of a single list of Eurasian Economic Union quarantine facilities, according to which the list of quarantine harmful organisms restricted in the territory of the Eurasian Economic Union includes Acroptilon repens (L.) DC.), Ambrozia artemisiifolia L. and colonic Cuscuta spp. belonging species. Broken creeper and Amrose species are found in Armenia's violent ecosystems but do not yet have invasive potential. Two of the three species that belong to Cuscuta and Armenia are Cuscuta approximate Bab. and Cuscuta erithymum (L.) Nath., which are dangerous for invasive species in other countries, are not widely spread in Armenia, Cuscuta approximate meets in a number of floristic regions, and Cuscuta erithymum only in floristic regions of Lori and Ijevan and tendency of intensive expansion, but it does not rule out the need for monitoring their prevalence. As for the third species, the Cuscuta campestris Yunck. It is considered an invasive species and is now intensively spread in the mountain belt as a parasite plant. For all species, the prevalence monitoring and coverage should be included in the list of quarantine harmful organisms, which, in the case of proper control of the State Food Inspectorate, will help prevent further spread.

Thus, the results of studies on the prevalence and biological properties of invasive and extraterrestrial vegetation that testify to the danger of the extinction of wild

vegetarian species, measures to prevent and / or eliminate these types of intrusion are very limited and do not contribute to the full prevention of their imports.

Means used to evaluate progress: state statistical data, state and international programs reports, analytical reviews, scientific articles, thematic research, expert conclusions, results of consultations with business entities, factual data monitoring of partial issues.

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; www.epiu.am; www.forestcommittee.am; forest-monitoring.am; www.armstat.am; www.mes.am; www.minagro.am; www.edu.am; www.cadastre.am; www.anau.am; www.ramsar.org/wetland/armenia; www.sczhe.sci.am/; www.sevanlake.am/en/the-problem-of-lake-sevan/; http://www.stf.am/; www.wrma.am; www.armmonitoring.am; www.dilijanpark.am; www.sevanpark.am; www.khosrovreserve.am; www.zangezurkh.am; www.reservepark.mnp.am; http://smn.am/; http://www.sczhe.sci.am/; http://www.botany.sci.am/; www.mnp.am/images/files/nyuter/2014/july/Gnishik_Management-Plan_2014-2018_Oct_2013%20compressed.pdf; www.sgp.am/en/Projects?id=75; http://www.enpi-fleg.org/site/assets/files/2173/ijevan_sanctuary_mp_-_arm.pdf; http://biodivers-southcaucasus.org/uploads/files/5b461247216e9.pdf; www.giz.de/en/worldwide/20319.html; www.mnp.am/am/post/1064; www.mnp.am/uploads/1/1532697351Project_2018.pdf; www.mnp.am/uploads/1/1519793715Xosrov-Paymanagir-DSH-18-07.pdf; www.mnp.am/uploads/1/1519793551Dilijan-Paymanagir-DSH-18-04.pdf; www.mnp.am/uploads/1/1519793752Arpi-Lich-Paymanagir-DSH-18-08.pdf; www.mnp.am/uploads/1/1519793668Zangezur-Paymanagir-DSH-18-06.pdf; www.mnp.am/uploads/1/1519793629APH-Paymanagir-DSH-18-05.pdf; www.mnp.am/uploads/1/1519793504Sevan-Paymanagir-DSH-18-03.pdf; www.kfw-entwicklungsbank.de/PDF/Evaluierung/Ergebnisse-und-Publikationen/PDF-Dokumente-E-K_EN/Kaukasus_TJS_2018_E.pdf; https://tjsarmenia.blogspot.com/; https://rm.coe.int/16806a6b73, https://www.epiu.am/naxagcer/irakanacvac-naxagcer/; http://ahpc.am/wp-content/uploads/2014/09/AHPC_Sevan-project.pdf

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Reliability of the evaluation level

☐ based on partial data.

Interpretation of the reliability level

It bases on the representation, coverage, accuracy of the used information and, in some cases, limited quantities

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National Target 6: Take the necessary measures to reduce the pressure on biodiversity

A category of progress achieved during the national targeted task implementation.

Progress is available, but the pace is insufficient.

[V] Without significant changes.

Additional information

The development of various sectors of the economy and the solution of social problems of the population generate certain environmental problems, the ways of which can be different depending on the degree of commitment and political will of the state, relevant structures and the society on the ideas of sustainable development and green economy.

Environmental issues in Armenia, particularly in relation to the conservation and sustainable use of biodiversity, remain as relevant as in the past decades, as our country is clearly aware of the dependence on the socio-economic situation of the population on access to natural resources. Despite the reduction in industrial volumes, the level of air, soil and water pollution has declined, but degradation of large-scale ecosystems, bio-resource utilization and species disappearance. The recent increase in the pressure on biodiversity is conditioned by the extreme use of biodiversity (especially forests), degradation of land, development of hydropower, significant expansion of mining, agricultural and construction works, tourism development. The impact of these pressures is further enhanced due to the socio-civic factors - the decline in the living standards of the population, the lack of inter-agency cooperation, the lack of adequate psycho-moral atmosphere in the society, the ecological education and the low level of education.

Hydropower production. The reason for the threat is the neglect of environmental risks during the construction and operation of hydropower stations with a capacity of up

to 30 MW, violation of the terms of water use permits, inadequate assessment of the impact of small hydropower plants on ecosystems and biodiversity in the short and long term.

2016 By the Governmental Decree of the Government of the Republic of Armenia, the concept of hydropower development in the Republic of Armenia was approved, which aims to maximize and effectively utilize hydropower resources in the country. While the adopted conception defines the ways of development of the hydropower sector in the country, taking into consideration the country's energy security and independence risks, it does not raise the need for environmental risk management during the construction and operation of the SHPP. The majority of SHPPs being designed, constructed and operated in the Republic are the drift-type stations located on natural water mains.

As of 2018 January 1 , 187 small HPPs generated electricity, their total installed capacity was about 366 MW. In 2017 electricity generation by small hydropower plants amounted to about 862 million kWh, which is about 11% of all electricity generated in Armenia (7762 million kWh). In 2018 electricity generated by SHPPs are expected to amount 1 billion kWh. According to issued licenses, by 2018, As of January 1, 31 SHPPs are under construction, with a design capacity of 57 MW and an annual production of 200 million kWh of electricity.

Although hydropower resources contribute to the development of the renewable energy sector in the country, CO^2 emits greenhouse gases emissions to the atmosphere, but causes numerous risks associated with loss of natural habitat for biodiversity, excessive use of water resources, landscapes change, irrigation water failure, ecosystem biodiversity. The impact is more pronounced on the diversity of the fishery as the structure of some small hydropower plants can not provide the free movement of the fish in the rivers, which is why the fishery in the areas above the SHPPs is largely represented by relatively poor diversity and quantitative composition as the fish species they do not have the chance to go up and down the river. Construction of hydropower plants also causes landslides as it is carried out without taking into consideration the possibility of landslide processes and the fragility of the land. There are many cases when landslides are activated after intensive construction, explosion, pipe and road

construction. This is also a social component. Small HPPs cause great tension in communities, as the community leaves the irrigation and drinking water partially or completely drain the rivers.

From the global point of view SHPP's provide ecological advantages, however they cause direct and indirect enivironmental adverse effects on local and national level such as:

a) Aggravation of living conditions;

b) Decline in number of fish, caused by imperfect structure of pipes and turbines;

c) Inaccessibility of spawn areas for fish, due to river fragmentation;

d) Formation of dry conditions at the riverbanks, etc.

Factors impeding the elimination / mitigation of hydropower pressures are conditioned by the imperfection of legislation and, at the same time, breach of existing legislation. In many cases, the impact of SHPPs on water biodiversity has not been disclosed or evaluated as there is often no impartial professional ecological expertise and an environmental impact assessment of the intended activity. In order to address the created environmental problems, to maintain and maintain the water protection system, it is necessary to set standards for the construction and operation of SHPPs that will prevent or reduce the harmful effects of small hydropower plants on the environment.

2018 The Government of the Republic of Armenia approved the draft law "On Making Additions and Amendments to the Water Code of the Republic of Armenia", which defines the list of prohibited strips and rivers for construction and operation of small HPPs. According to the bill, no water use permit will be issued for the construction of a new small hydro power plant if it is envisaged to build on the rivers where endemic fish species registered in the Red Book of Armenia or the construction of hydropower plants in the protected areas of the protected areas, 150 meters radius in the water protection zones. The adoption of the bill will contribute to the protection of the water system and the balance. "Support to Small HPP Reforms through Sustainable Use of River Ecosystems through the Dialogue of Public and Armenian Nature Protection" was developed and submitted to the executive for review of a small HPP green passport sample, which includes hydrological, ecological, technical, social characteristics. In case

of confirming the green passport sample, the green passports will be complemented not only with design and officially confirmed indicators, but also on the results of the monitoring conducted locally.

Landslides and ecosystems are violated as a result of the exploitation of open mines, due to the alienation of new land, the habitats of plants and animal species disappear and their populations are divided and diminished. Large volumes of waste accumulated at the waste disposal facilities, tailings and dumps occupy significant distances and are the sources of long-term pollution of the natural environment.

The mining industry's role in the economy is increasing day by day (for example, copper-molybdenum ore mining volumes in 2014 amounted to 22,222.0 thousand tons, and in 2016 - 29,712.9 thousand tons), but environmental issues are still not fully resolved. Due to mining, about 8,000 hectares of land were damaged in Armenia and another 1,500 hectares were under tailing dumps. Currently, around 220 million Armenian tailing dumps have been accumulated in the territory of Armenia. industrial waste that negatively impacts on environmental components and ecosystems such as land, water resources, air basin, bio resources and. According to recent data from the Environmental Monitoring and Information Center (SNCO) of the Ministry of Nature Protection (09.2018), 16 rivers of Armenia have the highest level of 5th degree pollution. As a result of the mining industry, the rivers of Syunik and Lori are distinguished by polluted rivers. Achanan (Norashenik) River runs through the 5th, worst class pollution in Syunik. Main pollutants are molybdenum, vanadium, potassium, sulphate, sulphate ion, which are the result of the Artsvanik tailing dump of Zangezur Copper and Molybdenum Combine. The Combine also affects the Voghji River, which has a 5th grade pollution caused by the high content of molybdenum from the Qajaran section of Kapan. 5th class pollution is also present in the Karcheva and Meghrighet rivers that are polluted by the Agarak Copper and Molybdenum Combine and other existing mining facilities. The Lori 5th class is polluted by Debed, Shnogh, Akhtala, Pambak rivers. The Akhtala Ore Processing Plant and Teghut Copper and Molybdenum Combine affects Debed, Shnogh and Akhtala.

The reason for the threat is the neglect of environmental risks and imperfect environmental expertise and monitoring, insufficient discussions with the population of the targeted communities at the planning stage.

Factors impeding the elimination and / or mitigation of environmental threats in the mining industry are conditioned by the dominant low productivity and high energy use technologies in terms of economic development of the country (5.4% of GDP) and, in some cases, for the assessment of the Karaberd gold mine site in the absence of detailed baseline data on the flora and fauna of the mine site[1].

One of the measures taken to mitigate the threats is the flora objects, particularly those of red-color plant species.

And the adoption of a legal act on the protection of their habitats. 2014 year By the Decree of the Government of the Republic of Armenia N 781-N, "The order of protection of flora objects of the Republic of Armenia and their use for the purpose of reproduction in natural conditions", which defines the measures for the protection of plants under threat of extinction as a result of economic activity. The transplantation of plant species under the threat of extinction has been established for favorable climatic conditions (such as protected areas or botanical gardens or in the Red Book as a plant registered area) to ensure the natural reproduction of plants. The actions defined by the legal act have already been applied to the pearl apricot found on the territory of Amoulsar gold mines. About 2,000 plant species have been transferred to Sevan Botanical Garden.

Studies on ESs in the mining industry have been carried out exclusively by the Lydian Company within the Amulsar gold mine program, the purpose of which is to provide an understanding of the ecosystem use and dependence of people and the impact of the project on the mining site. For example, when studying the area of Amulsar gold mine, Lydian has changed the location of the infrastructure, avoiding impacts on this habitats.

Measures taken to mitigate the dangers are also among the 2017 events. the following decisions of the Government of the Republic of Armenia:

[1] Ecosystem Services and their Role in Poverty Alleviation in Armenia - A Case Study of Karaberd Gold Mine, UNDP/UNEP "Economic Valuation of Ecosystem Services" Technical Assistance Project

1. On establishing the procedure for coordinating with the State Environmental Management Body in the field of environmental protection related to the use of subsoil waste management and subsoil waste recycling plans for subsoil use. The decision regulates the timeframe, forms and remedies agreed upon with the public administration body in the field of alteration of the changes made to the entrails-use waste management and waste recycling plans of the subsoil users, cases of rejection of the agreement.
2. "On setting standards for best possible technology", which contributes to the reduction of waste generation and environmental impacts through the introduction of environmentally sound technologies.
3. "Establishment of Technical Requirements and Standards for Managing Waste Management and Ground Handling and Recycling", which provides for the reduction of waste generation and their potential hazard through the introduction and processing of the best technologies, environmental protection from pollution from pollutants, efficiency increase.
4. "On the Procedure for the Handling of Recycling Waste", which regulates the recycling of entrained utilization of waste from subsoil users.

2017 The mining industry development concept has been approved by the Governmental Decree No 36-N of the Government of the Republic of Armenia, which outlines the main obstacles to the development of the sector, lack of comprehensive policies and strategies, gaps in the institutional field, omissions in management, socioeconomic and financial the existing problems, the lack of responsible investments, the lack of state geological investigations, and so on.

However, in the mining industry there is no government-funded government or government-driven strategy, which would make it possible to draw conclusions about the development and management of the sector in the long term. There is no uniform policy on the assessment of economic benefits and damages in mining, its socio-economic and cultural expediency in individual provinces. There are no substantiations that mining

currently has a priority for the country's economic development, which has been declared by the government.

Legislation primarily regulates the process of mining permits and environmental risks assessment, as well as the scope of state bodies responsible for it. By the way, there are socio-economic and net environmental deficiencies in the legislation that do not give an adequate economic assessment to the usefulness of mining projects in terms of social welfare of the public and the state's economic development. There are no environmental considerations for economic assessment and compensation, material liability for mining waste, and liability for compensation for damage or damage to biodiversity.

There are many reasons for the negative changes in biodiversity in the field of agriculture. Failure to comply with the rules of land management, impossibility of application of crop rotation in fragmented lands, inadequate use of land resources, use of imperfect irrigation systems, causing erosion and secondary salinization result in loss of natural ecosystem degradation and loss of plant species. In Armenia, secondary saline lands are already 25,000 hectares. Secondary salinization is a threat not only to wildlife, but also to crops. For example, as a result of chlorine-ionic toxicity assessment in secondary saline soils of Armavir marz communities of Ararat Valley (Zartonk, Arevik and Mggashat), a decline in crop yields of chloride toxicity has been registered.

About half of the country's arable land, about 220,000 hectares, is exposed to water erosion, irrigation and precipitation, and the fertile layer of soil is overhauled over time. If these processes remain uncontrollably, the land will lose its positive attributes, becoming unfit. Soil erosion is not just a narrow agricultural problem, as there are numerous exogenous processes, such as sloping, collapse, river pollution, and deterioration of living conditions of flora and fauna.

Due to lack of funds for development, lack of irrigation, internal and external migration, a large number of lands are not used or defective. Covering the abandoned, uncultivated lands, rapidly spreading weeds threaten the diversity of wild plants. According to 2017 Land balance, totaled AMD 446.0 thousand. About 34.0% or 151.4 thous. hectares are not cultivated or used in targeted arable land. hectare. In general, 80% of our country's land fund is exposed to different degree of degradation, which

results in the loss of biological and economic properties of this natural resource. The soil, as a natural environment, is characterized by the presence of a wide variety of ostrich animals and microbes that play a key role in such important biological processes as humus oxidation, nitrogen fixation, nitrification, denitrification, and so on.

In the recent years, a number of programs are being implemented in Armenia aimed at targeted use of land resources. Through state aid programs, land users are provided with assistance to effectively utilize sown areas and develop agricultural systems. Such programs contribute to the efficient use of agricultural land, intensive fruit and berry orchards through partial subsidization of loan interest rates, improvement of lending conditions, leasing mechanisms, agricultural machinery delivery and affordable targeted loans. Due to the implemented state aid programs, the area of the untouched land has diminished. 2014 year The number of fruit and berry orchards has increased by 381 hectares, making up 2016. 40 510 hectares. The increase in the prevalence of coriander fruits is especially noticeable. was 23,012 hectares, 20,618 hectares.

Implementation of drip irrigation systems contributes to the replacement of traditional irrigation methods that are inefficient and cause water erosion with water-saving and environmentally-friendly technology. The traditional groove irrigation on slopes leads to the accumulation of water outside the cultivated area and the occurrence of swamping, which, in turn, endangers the natural habitat of plants. Irrigation on slopes with drip irrigation prevents the occurrence of swamping and maintains vegetation habitat. According to data from the regional administrations, drip irrigation systems are currently operating on the territory of 1740 hectares. 2018 Drip irrigation systems will be put into operation on 62.6 hectares as of October.

An important and important step in determining the possible consequences of pasture degradation and potential management measures is the assessment of land degree degradation at different spatial and time scales. In developed countries, remote technologies are widely used to address these issues, which, unlike conventional methods, provide calibrated, quantitative, periodical, reliable and affordable information for large areas. The use of such technologies in Armenia is also topical.

In the case of anthropogenic anemia, forest felling caused by inadequate management of scarce resources causes erosion of soil, activation of mudflows and landslides, eutrophage, which leads to the loss of quantitative varieties of quantitative and qualitative changes and loss of natural habitats. According to the statistical data, the total deforestation (sanitation, dilution, transit) volumes continue to grow in the country by 2017. the volume of forest fires exceeds 29% the same registered index. One of the main reasons for forest felling is the heavy social situation of the population, which results in a great deal of pressure on the forests, using wood as a fuel. Illegal logging is one of the major threats to flora in the forestry industry. As a result, forest felling in the republic is still far beyond the natural recovery of the forest. A detailed description of forest deforestation impacts on forest degradation and biodiversity is presented in the fourth issue of this section.

Factors impeding the elimination and / or mitigation of environmental threats in forestry are conditioned by low solvency of the population, high demand for relatively cheap firewood, high rates of construction business development and its uncontrollability in the use of the used timber harvesting methods, inadequate knowledge of the population's useful services and benefits.

The initiatives aimed at eliminating this threat are aimed at implementing legislative and institutional changes in the forestry sector, widespread use of alternative and renewable energy sources, introduction of sustainable forest management principles, development of forest monitoring system and increasing population awareness.

Construction. Changes in the volume of construction in the recent years have the following dynamics: Construction volumes amounted to 463858.0 million drams in 2015, 481 496.9 in 2016, 410 602.9 million drams, and in 2017 - 429 931.6 million drams. AMD 7. As a result of construction, lands are alienated, landscapes and natural ecosystems are disturbed, causing a loss of habitat, threatening the survival of the species. For example, the length of the Yerevan section of the Hrazdan River is negatively affected by the growing plant species. Over the past ten years, the Aegilops crassa Boiss, which has

never been found in the Hrazdan Gorge, (Light blush) and Hordeum hrazdanicum (Gary Hrazdanian) populations have been significantly reduced.

The direct pressure on the biomedical building by construction results from underestimation of ecological risks. Nevertheless, during the planning, all construction projects are mandatory for biodiversity management plans to be strictly controlled by the relevant structures.

Environmental pollution. The main sources of water and soil pollution in Armenia are industrial and household wastewater, fertilizers and pesticides from agricultural fields during snow and rain, as well as solid household waste.

In 2017, monitoring of the quality of surface water bodies in Armenia was carried out in 43 rivers, from 103 observation points, 6 reservoirs, 6 observation points and 17 in Sevan lake. Including joint monitoring of Arax River pollution.

The main hazard arises from the accumulation and mismanagement of mining waste where polluted wastewater penetrates land ecosystems and water basins, endangering the land and water biodiversity. Mining companies do not make a contribution to reducing environmental pollution to generate excess profit. For example, every year the Meghrigan River basin is filled with 1 607 000 cubic meters of industrial waste water of mining companies and 681.1 thousand cubic meters of industrial wastewater in the Voghji River basin.

The assessment of water quality based on hydrochemical monitoring survey showed that in 2012-2013, About 20% of the rivers in Armenia corresponded to the 4th class of pollution (low quality), and by 2017, more than 35% have complied with the 5th grade (bad quality) pollution.

At present, 21 tailing dumps in Armenia are estimated at about 220 million cubic meters. dumplings As a result of the tailing dumps, the polluted river is considered to be the Ultimate Valley whose estimated value is about 150 million. tailing dumps containing sugar, selenium, bismuth, rhenium, gallium, copper, molybdenum, etc. The Debed River is in the critical state of the ecosystem, and the pollution of the Alaverdi copper smelter and Akhtala mining ore processing factories is the reason. The fauna of these and other

polluted rivers has definitely diminished, and the disastrous condition of river and terrestrial ecosystems goes deeper year by year.

The reasons for the threat include: non-performance of mining waste, ecologically safe neutralization, recycling and reclamation activities, inadequate coordination of recovery or land reclamation activities in extracted areas. One of the ways to solve this problem is legislative amendments aimed at rehabilitating violated lands.

In view of weakening the threats of the counterfeit and effectively organizing natural resource management, in 2018, The natural resources management strategy of the Republic of Armenia has been adopted, which includes the development of waste recycling works and the protection of groundwater mines and water courses from pollution, depletion and conservation. The Strategy defines the following basic principles of natural resource management:

1. Establishment of new technologies for the utilization of waste recycling technologies, which will enable to reduce the amount of non-wastewater or waste utilization waste;
2. safe operation of waste disposal facilities;
3. Implementing measures to prevent or minimize environmental and human health damage and accidents;
4. population safety and environmental protection.

The Natural Resources Management Strategy Includes an inventory of pollutant waste for the purpose of reducing and neutralizing pollution (2018-2025), as well as the monitoring of land pollution and other negative impacts on soil as a result of subsoil use (2019 and ongoing).

Starting from 2011, wastewater treatment plants have been constructed in Gavar, Martuni and Vardenis towns of the region, thanks to which the problem of wastewater treatment has been solved by 36% in Gavar, 47% in Martuni and 41% in Vardenis. By the means of the European Investment Bank in Sevan city it is envisaged to build a wastewater treatment plant with the cost of 3.87 million euros by 2019. Armenian Water and Sewerage CJSC have built two wastewater treatment plants in Jermuk in 2014 and

in Dilijan in 2015. There is only perfromed mechanical cleaning at all mentioned cleaning stations.

According to the results of surface water quality monitoring, the quality of water in the rivers and rivers of Armenia is "excellent" and "good" (1st and 2nd classes). After major settlements and cities, unclean utility-household wastewater is mixed with the soil, pollution increases, and water quality is "bad" (3-5th grade) due to ammonium, phosphate and nitrite ions.

Small projects have been implemented to prevent leakage of pollutants and vital components from Armenia, the contribution of which to the prevention of water resources pollution is not great. Thus, with the "Water Program of Small Communities of Armenia", which started in 2011, Wastewater treatment plants were built in Gavar, Martuni and Vardenis towns of Gegharquniq marz through the agreement signed by the EU and Armenian Water and Sewerage CJSC, which helped to solve the problem of wastewater treatment in 36% in Gavar, 47% in Martuni, in Vardenis By 41%. By the means of the European Investment Bank in Sevan city it is envisaged till 2019. to build a wastewater treatment plant with a cost of $ 3.87 million. euro. Within the framework of the same program, "AWSC" CJSC built two wastewater treatment plants in Jermuk and in Dilijan in 2015. Only mechanical cleaning is performed at all mentioned cleaning stations.

In rural communities, the situation is even more complicated, as most of them are not connected to cleaning systems and do not have a sewage network. Wastewater is infiltrated into the soil and penetrates groundwater, polluting them. Households in villages and villages, as well as industrial wastewater, are dumped into surface water bodies without polluting, polluting water resources, degrading water and land ecosystems, irrevocably changes the quantitative and qualitative characteristics of their services.

Surface flows and landscapes are also contaminated with solid household waste. It is known that landfills are a source for sustainable organic pollutants. In some areas, the total concentration of these pollutants exceeds the hygienic norm of the highest quality normally owned by them 13-60 times. In the land of Ararat, Hrazdan and Sevan landfills, polychlorinated bibenenzols were found, and in the landfill of Ararat city, they were

observed to exceed the PCBP total concentration norm. Implementation of measures for the prevention and control of illegal landfills, as well as recultivation of landfill sites subject to liquidation according to inventory data, is envisaged to be implemented in the annual program for restoration, conservation, reproduction, normal development and utilization of Lake Sevan ecosystems approved by the Government of the Republic of Armenia "," Improvement of landfill and regular waste management "important events, ronk first year of the program and aim to reduce lake pollution of water sources.

Though quantitative indicators of Lake Sevan phytoplankton in 2016-2018 are located within the range of values typical of oligotrophic waters, however, the tendency to decrease the level of tropical lake ecosystem has not been recorded. 2016 The "flowering" of water recorded in the fall proved that evolution of the caviar algae Anabaena flos-aquae. 2018 In July, the same type of heterogeneous breeding took place, which proves the extreme ecological state of the hydro-ecosystem, during which it demonstrates a stress reaction. Lake Sevan in 2018 The cause of "flowering" is the sharp increase in water temperature (up to 24 ° C), high concentrations of phosphate and ammonium ions, and the result of an integrated effect of large quantities of lake water. The presence of organic substances, the growth of phosphorus, nitrites and ammonium ions, is probably also conditioned by the swelling of the shrubs in the coastal area as a result of the rise in water level, and under the water of the fragmented tree trunks. In order to prevent the consequences of their subsequent rotation, pre-treatment of wetlands, as well as forest remnants cleaning. In total, 5,000 hectares of the Sevan National Park covered water from 2005 to 2017. 2164,17 hectares were cleaned, of which 1840,23 hectares by means of the state budget, 323,94 hectares by individuals. Rapid rehabilitation of fish stocks is also an important issue as there is a huge grains in the lake, in which the ecological processes of the lake will develop.

Another important factor is the agricultural drainage waters and livestock wastewater that infiltrate the surface of the river basin, resulting in increased nitrogen, phosphorus and organic carbon content. Agricultural water also enters the streams of pesticides and chemicals that tend to accumulate in any circle of the food chain, leading to health problems.

The source of environmental pollution by the agriculture is the mineral fertilizers and pesticides that are accumulated in soil and polluted groundwater and rivers as a result of the use of moderate volumes, which results in the violation of plant growth, development and reproduction, changes in the species composition of agronomic, valuable and rare species reduction of populations.

The danger of separation is the exploitation of obsolete pesticides, which leads to the destruction of biodiversity and the accumulation of expired pesticide stockpile endangers the health of the population. The reason for the threat is the imperfect legislation, improper control over the fulfillment of obligations of natural and legal persons engaged in the cultivation of agricultural land. It is necessary to raise awareness of farmers on agrotechnical rules, modern technologies and consequences of violations, and to carry out systematic monitoring of land pollution.

In order to reduce the threat of environmental pollution in agriculture, organic agriculture programs are being implemented. In organic farming conditions, anthropogenic pressure is weakened, mineral fertilizers and pesticides are eliminated, the system is based on organic fertilizers, natural meliorants, green fertilization, active vortex, water resource savings, ecological optimization of agro-landscapes and other activities.

With the support of the Global Environmental Facility and the UNDP-supported program "Destruction of Expired Pesticide Reserves and Pollution of Persistent Organic Pollutant Contaminated Areas" (2015-2019), efforts are being made to address the problem of accumulating hazardous waste and overdue pesticides, non-usable pesticides by means of demolition and demolition of sites with stable organic pollutants. Specifically, within the framework of the project it is envisaged to destroy about 900 tons of pesticides in the Nubarashen pesticide cessation and other chemical wastes in the other 24 warehouses of the country, as well as to destroy 7100 tons of polluted soil at Nubarashen cemetery. Implementation of the project also expects capacity building to empower sustainable organic pollutants pesticides efficiently and reduce their emissions.

Autotransportation is a source of pollution for the atmosphere. The number of cars is constantly increasing and at the same time the harmful emissions in the atmosphere

increase. 2016 the motor emissions in the Republic of Armenia totaled 52% of total emissions, and 76% in Yerevan (according to expert estimates, the number of vehicles registered in Yerevan city). Main pollutants are nitrogen dioxide, carbon monoxide, sulfur dioxide, suspended particles, benzene and aromatic carbohydrates and lead that penetrate into the atmosphere causing pollution of soil, air and water basins. Sulfur dioxide emissions consist of about 35% of total emissions and 90% of nitrogen oxide emissions. The age of rolling on air quality, which is generally higher than 16, is negatively affected. The state of public transport rolling is worse. Due to the impact of these factors on the population and the environment, including biomedical components, accumulation of harmful substances occurs in agrocenoses, which in turn leads to the reduction of plant populations.

A factor hindering the mitigation and / or mitigation of the threats is the social status of the population, which is conditioned by the slow process of modernization of private motor transport and the need for improved financial investments.

One of the first steps to improving the situation and mitigating the threat is Yerevan's Green City 2017-2030. The action plan, within the framework of which is to reduce the harmful emissions of motor transport, is to introduce a new model of buses and modernize public transport by 2020. At the end, rolling 10 electromobiles.

2016 On December 15, the Government of the Republic of Armenia has approved the concept of draft new edition of the RA Law on "Atmospheric Air Protection". The new edition will include provisions for air quality assessment and the implementation of widely used "best-available technologies" in developed countries to limit emissions.

The issues of environmental pollution will be addressed in 2018. The "Environmental Management and Natural Resource Management Strategy and Action Plan" approved by the Government of the Republic of Armenia, which includes the creation of a monitoring ground for man-made pollution monitoring, reduction of direct burden on biodiversity, and restoration of damaged habitats.

Recreation and Tourism. The negative impact of recreational and tourism on biodiversity is mainly reflected in recreational tomatoes and vegetated flowers, which

leads to the reduction of some species of vegetation populations in the recreation areas and the change in the species composition of coexistence.

Another crucial threat is the non-regulated tourism. It is noteworthy that even the developments in this field, which can boost economic growth today, cause damage to the wildlife in case of incorrect approaches. The entire coastal zone of Lake Sevan is enclosed with different types of cottages, hotels, restaurants, the beach is fenced, waste management is poorly organized, no wastewater treatment plants. Because of this, the water is polluted, the landscapes are broken, and the coastal zone becomes unsightly. This is an example of how much tourism can be overloaded.

Travel agencies involved in this area often do not know the biodiversity issues of the area and do not apply to specialists in designing travel routes to get proper information on the vulnerability of the area. If the expedition goes through the alpine zones, the bird world is not so damaged. However, tourist trails are being developed which cover very vulnerable areas for nesting areas. In such cases, the tourism team should be aware of the nature of the habitats that can be avoided as far as possible from potential threats to wildlife. There are many cases when the number of participants in the cluster groups exceeds the load norms for the site, which adds to the vegetation recuperation and causes anxiety to the animals. For example, the Norashen Reserve zone within the Sevan National Park poses a danger to those tourists who are approaching the Armenian Poultry colonies during their egg-laying or breeding, undermining their reproduction.

In the upper flank of the northern forests of Armenia, in the Caucasian Marine Corridor - Lyrurus mlokosiewiczi, cattle breeding causes a large number of infant mortality. Over the last few years, the number and distribution of the Caucasian marine population in the upper boundary meadows of Dsegh CAT forests have been reduced due to overgrazing and frostbite (tea) leaves and crops uncontrolled cultivation. Threats include poaching, the destruction of the eggs and the bird's anxiety by the shepherd dogs.

Since 2000, the birdwatchers of Armenia have visited the group of large European travel companies or on their own, visiting birdwatchers (birdwatchers) in Armenia. With

their help, they also manage to collect data on the rare and nasty species in Armenia. Though some PSAs have been implementing large-scale mammals monitoring, data collection on birdwatching is difficult due to lack of orientalists and funds. For the same reason, only a few of the 18 ITCs are periodically monitored. Often, the number of bird species and its population is investigated by the efforts of non-governmental organizations, as well as by the Zoological Institute staff of the NAS RA.

The main cause of the epidemic is the lack of relevant institutions and public awareness of the cost of biodiversity components, ESs and eco-initiatives, as well as incomplete perception of the realistic goals of ecotourism. Despite the interest shown by Armenia's stakeholders in the development of ecotourism and in income generation, there is little experience in developing and implementing ideas and strategies in sustainable ecotourism. That's why the proposal for ecotourism does not meet the demand in the market. Moreover, even ecotourism in terms of environmental protection may be dangerous due to inappropriate planning.

Measures to mitigate threats include programs implemented by state and international environmental organizations and non-governmental organizations aimed at promoting awareness and agrarianism, raising awareness of the role and value of ecosystems.

TJS-III aims to develop sustainable tourism at protected areas and around national and provincial levels, as well as support documentation development and service development. For this purpose, the following measures are envisaged:

1. Development of sustainable tourism standards and guidelines for ESIAs.
2. training of staff;
3. Development of services promoting sustainable development;
4. Establishment of protected areas as ecotourism, regional and transboundary networks.
5. Advancement of proposals in the local and international markets.

It is also important to promote the development of transboundary tourism services through inter-sectoral collaboration and participation of tour operators and communities, which will create prerequisites for the formation of a protected area network.

The "Sports and Adventure Tourism Development in Stepanavan" (2018-2019) project, implemented within the framework of the GEF SGP, aims to improve recreation zones in Stepanavan forest areas through the use of opportunities for income from tourism services. Prepare environmental information bulletin boards and signs, organize environmental awareness trainings and seminars. Another project, "Community-Based Ecotism as a Sustainable Livelihood in Tumanyan Region" (2018-2020), aims to reduce the dependence of the local population of Dsegh and adjacent communities through the use of ecotourism potential and eco-education. It includes information and capacity development training for schoolchildren in Lori, Tavush and Shirak marzes, organizing festivals for agro-tourism development and collecting traditional knowledge.

Poaching and unmanageable hunting. In 2007, RA Law On Hunting and Managing Hunting Farms adopted the Law of the Republic of Armenia "On Hunting and Hunting", which regulates public relations in the field of hunting and hunting, ensuring hunting, protection, reproduction and sustainable use of hunting animals , the legal basis of hunting and improvement of hunting, hunting and hunting economy. Based on the requirements of this law, the Government of the Republic of Armenia According to N 860-N, the list of "Protection, Protection, Usage and List of Scenes of Animal World Facilities" was approved. It sets out the principles for determining, maintaining and using wildlife objects (desks), the list of scaffolds, and assortment of animal products. Hunting areas are determined based on the types of hunting animals and their quantities in the territory not registered in the Red Book of the Republic of Armenia.

Though legal bases have been created to carry out legal hunting, in many cases it is not done properly. Starting from 2011, the spring hunting season has been reduced to 15 February each year. Additionally, over the past few years, under conditions of climatic seasonal fluctuations affecting nursing time and natural course, scientifically-justified corrections have been made regularly, both on hunting terms and on species composition and quantities of allowed hunting animals.

Hunters mostly do not possess the ability to identify and distinguish between the types of fire that often appear on the IUCN Red List and in the Red Data Book of Armenia. The number of bird numbers has been decreasing as a result of privatization

and unregulated hunting in Tashir, ITU, Lori Plateau, small lakes and waterfowl areas (which serve as a landfill and accumulation site for irrigated bird species). Such an image has also been recorded in the Metsamor River and Armash fish farms. The illegal hunting birds suffer because of illegal hunting because their migration begins a month after the hunting season. Over the last two or three decades, due to illegal hunting, the Slowdown and the Smaller subdivision levels have dropped dramatically.

Back in 2004 A pilot project was implemented to create a hunting economy. According to the decision of the Government of the Republic of Armenia, 2400 hectares of Yeghegis canyon in Vayots Dzor region and 495 hectares of Geghi and Daranadzor areas of Syunik marz are operated by Safari International Ltd., which carries out protection, registration and monitoring of large mammals. The registration data provided in the Vayots Dzor region show that thanks to the proper maintenance of the private organization, the number of Bezoar goat, Armenian muffle and brown bear doubled and tripled. The company organizes and implements a winning and scientific hunting of animals (birds), in accordance with the provisions established by the legislation.

Fishing and crayfish is more developed in Lake Sevan and occurs under ineffective control. In the last two years, illegal fishing has started to activate along with the tendency of restoration of whitefish reserves in Lake Sevan. According to unofficial data, in 2014, During the period of illegal hunting, it amounted to 80 tons, and in the following years, along with the increase in fisheries, the volume of illegal hunting began to grow again. As a result of uncontrolled fishing, seaweed and poultry fishing in the lake is noticeably aging since year-round, since it is mainly the fishing composition of fish, which is irreparably damaging to fisheries.

2018 In September, imports of fishing nets (networks) with a shear size less than 50 mm were prohibited in Armenia, in order to exclude fish fishing from non-commercial quantities.

By the way, for amateur fishing, the number of permits granted to individuals in 2018 was unprecedented (over 2000).

Means used to evaluate progress: state statistical data, state and international programs reports, analytical reviews, scientific articles, thematic research, expert

conclusions, results of consultations with business entities, factual data monitoring of partial issues.

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; www.epiu.am; www.forestcommittee.am; forest-monitoring.am; www.armstat.am; www.mes.am; www.minagro.am; www.edu.am; http://www.minenergy.am; http://www.scws.am/; www.sczhe.sci.am/; www.sevanlake.am/en/the-problem-of-lake-sevan/; www.wrma.am; www.armmonitoring.am; www.sevanpark.am; http://www.sczhe.sci.am/; www.sgp.am/am/Projects?id=60; http://www.sgp.am/am/Projects?id=97 www.mnp.am/images/files/naxagic/2014/01_23_04_2014_pesticid_cragir_tex.doc

Reliability of the evaluation level

☐ based on partial data.

Interpretation of the reliability level

The level of reliability is based on the representation, coverage, accuracy of the information used, and in a limited number of cases

Monitoring data adequacy for assessment assistance

☐ the monitoring of the given NT is not complete, only part of the territory or problem

National Target 7: Establish mechanisms for promoting biodiversity conservation and sustainable use.

The progress achieved in the implementation of the national target.

☐ Foster towards implementation process.

The effectiveness of promoting biodiversity conservation and sustainable use is linked to the introduction of the ESs payment system, which is not currently being implemented due to the lack of legislative and economic mechanisms in Armenia. As regards the compensation and encouragement mechanisms promoting the development of Armenia's AMLS system, it should be based on the well-known principles aimed at

enhancing public participation in the management of SPOs and building capacity for natural resource management. In the process of expanding the boundaries of existing ESDs, creating new EMPs and environmental corridors, it is not ruled out that their adjacent land users or owners can increase the pressure on natural resources in the absence of effective control measures and levers of liability controls to compensate for their income losses. Often, they use measures that contribute to activities or projects that are not addressed exclusively for sustainable use of biodiversity, but in a mixed way to assist in the achievement of key objectives. Such activities include the promotion of biodiversity-dependent goods and services development and commercialization, such as sustainable tourism or ecotourism as well as non-forest forest resources. Indirect incentive tools include community resource management programs or participatory management models for SMEs, which, by increasing local awareness and creating sense of responsibility, have a positive impact on the use of natural resources. In this case, the introduction of incentive mechanisms will contribute to enhancing the effectiveness of stakeholder involvement in the activities of organizations involved in the management of SPOs as well as in the participatory governance of the SPOs. The use of such incentive mechanisms is provided by the "National Strategy for the Development of Specially Protected Areas of Armenia and National Action Plan".

A number of programs are being implemented in the spheres of agro-diversity conservation and sustainable agriculture, which are aimed at reducing compensation levers. For the purpose of promoting the effective use of land resources and the development of agricultural systems in the border regions, the Armenian village has initiated the "Provision of State Support for Actual Seeds of Cereals Crops" program, according to which the land users of 37 border villages are provided free of charge state support for autumn sown cereal crops For sowing areas (60000 AMD per each per hectare). The program is in the stage of implementation, its effectiveness will be assessed after completion of the project. According to predictions, due to the support provided, arable pastures, pre-cultivation and sowing will be made on 33 hectares.

Within the framework of the program of subsidizing interest rates for investment of anti-hail networks in the sphere of agriculture of the Republic of Armenia, for the purpose

of fodder development, mitigation of climate change risks, reduction of natural disasters, in the Republic of Armenia, under the framework of targeted loan interest rate subsidizing mechanisms, : Hail-resistant networks are a solid guarantee of quality harvesting and almost 100% protect the gardens from hail, as well as from winds and birds. At present, the hackers in the republic are placed on a very limited range. In 4 hectares of fruit and 5 hectares of vineyards, hail-resistant nets are installed under the technical support of the Food and Agriculture Organization of the United Nations and funded by the European Union, financed by the European Neighborhood and Rural Development Project, about 100 hectares. As a result of the project, it is expected to invest about 395 hectares of hail-proof network systems in grapes and orchards annually. In Vanadzor, the only hail-proof network in the region and the entire system for their introduction are already being exploited, allowing for the use of hail-proof networks to provide guaranteed protection from natural disasters.

2017 Developed and implemented a "Subsidy of loan interest rates for the establishment of intensive orchards cultivated in the Republic of Armenia", aimed at the development of fertility in the republic by promoting intensive fruit and berry orchards, increasing the production of fruits and berries, import substitution and export increase of volumes.

Taking into account the lack of effective chemical remedies against the phylloxera in the world, the United Nations Food and Agriculture Organization (FAO) has developed and is implementing the "Technical Assistance for the Production of Grape Phylloxean Resistant Crop Planting Material" (2018-2020) aimed at promoting phylloxera prevent further spread and mitigate the impact. It is envisaged to produce grape phylloxeradic resistant fertilizer using biotechnological methods to prevent further spread of phylloxera with other planting material imported from abroad, as well as the further spread of pests and pathogens. Implementation of the project will help prevent the import of phylloxatin-resistant vaccines from abroad and consequently the further spread of phylloxera and other dangerous pests and pathogens. Plants of grape vaccines and phylloximeters resistant vaccine produced by biotechnology will be maintained in vitro gene pool and will be available to all interested persons.

Means used to evaluate progress: state and international programs' reports, analytical reviews, expert conclusions, and outcomes of consultations with business entities.

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; www.minagro.am; www.edu.am
www.un.am/hy/news/791; http://minagro.am/AB- /;
https://eeas.europa.eu/delegations/armenia/52997/node/52997_hy;

Reliability of the evaluation level

☐ based on partial data

Interpretation of the reliability level

The level of reliability is justified by the limited representation, coverage and accuracy of the used information

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National Target 8: Improve the conservation of genetic diversity of wild relatives of cultivated plants and domestic animals, as well as valuable socio-economic and cultural species

The progress achieved in the implementation of the national targeted task

☐ halfway.

Armenia is a collection of genetically diverse crops of cereals, which include selection and traditional varieties of varieties of economically valuable crops, wild relatives of crops and wild edible plants. The listed genetic resources (hereinafter referred to as "GR") are important constituents of the country's agro-diversity, contribute to the sustainability of agricultural production and are essential for food security and welfare of the population and are considered as part of national heritage and sovereignty. GRs serve as a starting material for the acquisition of high quality varieties adapted to new, environmentally friendly crop varieties, contribute to ecosystem stability, ESs protection and climate change mitigation.

Taking into account the above role of the SR in Armenia, their protection, sustainable and sustainable use is gaining ever increasing importance as an essential component of agricultural and environmental policies. The maintenance and use of the GRs is carried out in accordance with the priorities set out in the Sustainable Agricultural Development Strategy in which special attention is paid to maintaining the old local varieties of crops and crops, extending the potential of the genetic bank, the establishment of economically valuable plantations and breeding grounds and balanced use of natural resources.

The "Strategy for Sustainable Development of the Rural and Agriculture Sector of the Republic of Armenia for 2010-2020" outlines the main directions of agricultural policy and identifies issues, including the issues of conservation and sustainable use of plant genetic resources, in order to solve them a number of actions are being carried out in Armenia and national and international programs , Proceeding from the objectives of the Convention on Biological Diversity within which Armenia has undertaken commitments to genetics the protection and sustainable use of resources, and their accessibility.

In order to ensure the sustainability of the crop sector, the Government of the Republic of Armenia With the Protocol Decision N 7, the "Program for the Development of the Wheat, Peas, Peas, Spring Barley, Corn, Alfalfa, Chickpea, and Buckwheat Production in the Republic of Armenia" is aimed at raising the level of self-sufficiency of cereal, leanfish and fodder crops, , increasing the income of economic entities engaged in agriculture.

Taking into account the strategic significance of creating a seed farming system in the crop yield, the state seed and seed breeding program of some crops and cereal crops is being implemented, which aims to increase the production volumes of high quality seeds produced in the country, to enlarge the varieties of crops, which in turn will promote crop yields raising the income of farmers. It is planned to make about 10.5 thousand. hectares of wheat and spring barley, 500 hectares of leeks and 450 hectares of fodder crops.

Over the last three years, 130 local varieties of melons and gourds have been created and distributed within the framework of the projects implemented in the Scientific

and Research Centers of Vegetable and Technical Crops and Farming of the Armenian Ministry of Agriculture. 14 wheat frosts, 4 barley beans, 9 soybean seeds, one varieties of peas and peanuts. At present the state-run sampling plant includes 3 wheat berries, 2 barley varieties and 1 soya soybeans, as well as 24 prospective varieties of hybrids and hybrids.

The development of horticulture is one of the priorities for the development of horticulture - 420,000 AMD. The full use of arable lands, at least 400 thousand hectares. the conservation and sustainable use of intensive cultivation and genetic resources of agricultural crops and their wild populations. In present conditions, taking into account the presence of fragmented small soil, the development of intensive horticulture is urgent. Intense gardens, unlike traditional gardens, allow for a short period of time to achieve high yields, high yields and secure returns. 2017 The program "Subsidizing of loan interest rates for the establishment of intensive orchards cultivated in the Republic of Armenia with modern technologies" is being developed and implemented. intensive gardens to reach 15-20% on the common garden. 2016 As of today, the area of intensive gardens settled on the territory of Armenia was 242 hectares, in 2017 it increased by 294 hectares, and by 2018 - about 190 hectares.

The Grape Research Center of the Ministry of Education and Science of Armenia carries out activities aimed at the collection of valuable varieties of grape and fruit species, planting material, establishment of new collective and maternity gardens, and specification of distribution of zones. Within the framework of the project, In the farmhouse of Aygavan village of Ararat region, a nursery was established, with about 195 grape varieties, clays and forms. The small nursery was also established in the Merzavan community farmhouse of the Echmiadzin region of Armavir marz with about 15 varieties. Within the framework of the project "The Importance of Cultivation and Wild Grape Biodiversity in Armenia in the Environment Balance", gene pools of cultivated and wild grapes have been discovered that are resistant to diseases and pathogens and to changing environment, adapting to sustainable varieties of grape genetic resources. , which has an important environmental significance.

The protection of the unique genetic resources of the breakwater is crucial for the country, both for the maintenance of agro-biodiversity and for the development of winemaking. For this purpose, with the support of the United Nations Food and Agriculture Organization, the project "Conservation and sustainable use of grape genetic resources in Armenia" (2015-2016) was implemented to ensure the preservation of grape genetic resources for sustainable grape production in Armenia and to establish grape collector garden. As a result of the project, a grape display park, white-beef catfish Kangun (0.5 hectare) and table aboriginal Pink Yerevan (Red Kishmish - 0.5 hectare) were founded in Echmiadzin region of Armavir marz. In the vicinity of the above-mentioned park, a grape colony (1.3 ha) was established, with about 300 varieties. Within the framework of the same program, imports of 6 phylloxodine-resistant 6 vaccines and 6 varieties of European grapes from abroad have been based on 2.0 hectares of phyllochaser-resistant vaccine mattress and 0.1 hectare nursery. As a result, grape-farming farmers will provide grape-grade grafted planting material.

Grape genetic resources research at the Center for Applied Biosciences at Yerevan State University has identified and described grape neglected and forgotten varieties of grape varieties, their genetic, morphological and technological diversity has been studied in terms of preservation and subsequent use of grape rich genofond. In the provinces of Ararat, Vayogh Dzor, Syunik, Lori marzes, Armenian grape aboriginal varieties, as well as wild Vitis vinifera L. subsp. genistic research of silvestris populations, during which varieties have been identified, new varieties and life styles have been identified.

Genetically investigated the grape vine found in the Areni -1 cave in Vayots Dzor, whose height was estimated as radioactive carbon as an advanced middle ages (780-1000). It turned out that in the Gnishikadzor and Noravank Monastery Gardens there is a similar genetic similarity with the Black Areni species preserved so far, which gives us a preliminary idea about the potential of the Areni varieties.

The programs of the Agrobiotechnology Scientific Center of the National Agrarian University of Armenia contribute to the ex-situ conservation of endangered species of local origin and their wild relatives and increase the preservation efficiency due to the use of in vitro technologies. Particularly, recovered and currently maintained in vitro

approx. 10 traditional varieties of wheat that are encountered in separate farms in individual farms. Created potato virus-free tree planting material, with about 30 varieties, ready for reproduction and production. At present, the seed gene collection collection of the genetic bank is 3135, In comparison with the previous year, it increased by 522 potatoes (20%). The main number of genobank samples is represented by selective breeding of cereals (962 samples), lecromants (550 specimens) and vegetable (750 specimens), traditional varieties and their vineyards.

Within the framework of the Millennium Seed Bank Program (2011-2015), with the support of the Royal Quarter Botanic Garden of Great Britain and the Botanical Garden and Berlin Museum of Botany of the National Academy of Sciences of Armenia, a Seed Bank was set up for long-term seed storage, specialists passed training courses on seed harvesting, viscosity determination and other issues. The seed collection is gradually expanding, processed into a seed samples database. Currently, seed collection includes 552 species of 251 species of 51 families. The most represented are Fabaceae (22 tribes, 64 species) and Poaceae (29 tribes, 64 species). Starting from 2018, the Institute of Botany SNCO is implementing the "ex-situ preservation of some of the flora species in Armenia through the microbication and seed collecting methods", which will promote the effective protection of endangered species in ex-situ conditions.

The Scientific Center of Vegetable and Technical Crops of the Ministry of Agriculture is studying and maintaining a rich gene pool of local varieties of melons and gourds, covering more than 3800 samples, which has increased by 45% compared to 2014.

The Plant Gene Pool and Selection Laboratory of the National Agrarian University of Armenia maintains the first collection of seeds in the country, which was established in 1981 to preserve a unique gene pool of Armenia's crop plant species. At present, the laboratory is cured of cultivated and wild grain crops, wild vegetable plants (beets, carrots, onions, etc.), spices (coriander, parsley, cottage cheese, cinnamon, etc.) and lecromycin plants (tomatoes, lentils, wick, clover, alfalfa and other) 5523 samples, of which 2523 (46%) are samples of cultivated wild relatives. Seed collection is represented by 22

species of wild and cultivated cereals, 35 kinds of fodder, vegetable and fruit crops. Laboratory Collection 2014 compared to 1203 samples (22%).

Among the threats of plant genetic resources for food production and agriculture, which is a component of the biodiversity, genetic erosion occurs as a result of rapid replacement of traditional varieties of hybrid and modern varieties. In order to reduce this threat, in the fields of conservation, use and reproduction of biodiversity in Armenia, 2016-2020, The State Program of Action envisages the elaboration of old traditional crops, in particular, cultivated varieties, gene pool restoration and preservation activities, which will allow preserving traditional gene pool of traditional varieties due to planned activities.

Among the programs for on-farm conservation and management of CFMs are also GEF SGP projects, Berd Berry. the promotion of wild berries cultivation and production in the context of maintaining the local agro-ecological system in highland communities in 2016-2018, with the aim of supporting the cultivation of wildcurum (Vaccinium uliginosum), Alatau (Crataegus) and Berberis vulgaris L. on the basis of their development. The project included wild blueberries, hawthorn and grape cultivation in small farming communities, to reduce wildlife volumes and to maintain species. At the same time practical training on wild plant collecting was held, about effective and correct assembly rules, the use of berry harvesting and assembly regulations.

The living plant collections form the basis of botanical gardens and dendroparks. In Yerevan Botanical Garden, besides 1070 species of grassy trees and about 2000 species of floristic plants growing in open ground, around 500 species of tropical and subtropical plants, which belong to 74 families and 150 species, are preserved in greenhouses. The collection of "Armenia Flora and Greenery" permanent exposition plot includes about 1,000 varieties, which is one third of Armenia's floristic stockpile. On the plot are both extensive and vegetarian-geographically interesting, as well as rare and endangered species, economic interest (pharmaceutical, essential oil, ornamental plant, etc.), wild seedlings and many other plant species.

Armenia is also one of the oldest centers of cultural diversity, their origin, creation and preservation of archaeological and endemic races and their ancestral herds. The

presence of domestic animals also speaks about being an important hub for growing agricultural animals in Armenia. There are still sheep, goats, and pigs in the country, of which the modern types of domestic animals have come into being. Endemic breeds of sheep breeding in Armenia are derived from Armenian mouflon, which is actually a long-time relative of sheep, and endemic species of our country, which are of great importance in terms of food security and biodiversity conservation (lizard, raven, Sevan trout). Reducing the water level of Lake Sevan since the 20th century has dramatically changed the state of endemic species of habitats and horticulture. Since then, the preservation of the genetic resources of the lake of Sevan has been successful only in artificial reproduction in fisheries.

Armenia has been a member of the Food and Agriculture Organization's Regional Commission for Fisheries and Aquaculture (CACFish) in Central Asia and Caucasus since 2010. The production of fishing and aquaculture, as well as the supply of water ESs, is based on the availability of water genetic resources (CWR). The use and exchange of GHGs have become very important elements that have enabled aquaculture to become the fastest growing and profitable industry in the food industry. Nevertheless, the preservation of GHG in our region is still not a priority, since special and long-term national programs for the restoration of ecosystems and habitats, selection of breeding and creation of gene banks are needed for the genetic reconstruction of fish stocks.

From the socio-economic point of view, the conservation of genetic diversity of valuable species is on the one hand the development of agriculture and, on the other hand, the target at the crossroads of environmental strategies. A number of issues typical for these two areas can be solved through the development of organic agriculture in the country, which is a system that aims to improve and encourage agricultural production by looking at land improvement as a quality, environmentally friendly foodstuff. In the field of organic agriculture, toxic substances, stable pesticides, chemical fertilizers are not used, but organic fertilizers (mainly manure) are used, and pest and disease control is used only with herbal remedies. As a result, wild biodiversity does not deteriorate, healthy agrochemicals, biological cycles and genetic resources are

preserved. Organic agriculture is guided by the logic and principles inherent in living organisms where all the elements (soil, plant, agricultural animals, insects, farm activity and local conditions) are closely linked to one another.

There is a great potential in the Republic of Armenia for the development of organic agriculture, with a great deal of work done by a number of local and international organizations. It is worth mentioning the work done by EcoLog, Agribusiness and Rural Development Center, Green Trail, Women for Health and other organizations. Specifically, EcoLOBT LLC is an internationally recognized organic agriculture and food certification body that conducts organic certification for land, flora and fauna products as well as wildfruit collection, bee keeping and wine. The Green Trail for Agricultural Support NGO, with a view to promoting sustainable agriculture in Armenia, is collaborating with the Ministries of Agriculture and Nature Protection and implements numerous programs and initiatives, highlighting and supporting the production of ecologically clean agricultural products. According to the statistical data of the Ecoglob Organic Certification Body, as 17 farms were certified as an auxiliary economy, the total area under organic farming was 500 hectares, and in 2017 the number of certified farms was 36, the total area of organic farming was 730 hectares. 2018 As of October 2012, another 21 plants in the field of plant growing are in the certification phase[2].

In order to promote organic agriculture in Armenia, The EU-funded "Organic Farming Initiative" grant project has been launched in September, co-funded and implemented by the Austrian Development Agency (NSG). By improving legislation and providing comprehensive marketing support, the project results in a significant increase in participants and volumes of the organic value chain, thereby contributing to the reduction of mineral fertilizers and pesticides consumption in the country and maintaining natural ecosystems and biodiversity conservation.

Means used to evaluate progress: state statistical data, state and international programs reports, analytical reviews, scientific articles, thematic research, expert conclusions, results of consultations with business entities, factual data monitoring of partial issues.

[2] www.ecoglobe.com

Relevant web sites, web links, files

www.arlis.am; www.minagro.am; www.edu.am; http://www.botany.sci.am/; http://rcvc.agro.am/; www.un.am/hy/news/791; http://minagro.am/AB- /; http://www.sgp.am/am/Projects?id=73; https://eeas.europa.eu/delegations/armenia/52997/node/52997_hy; https://cdn2-eeas.fpfis.tech.ec.europa.eu/cdn/farfuture/5T3DjhOZbsc5WUOrQqCUQPDrpgs0dh7AReK4FOv7eqQ/mtime:1519816819/sites/eeas/files/oasi_fs_arm_final.pdf http://dcf.am/en/projects/136; http://www.fao.org/armenia/news/detail-events/en/c/428505/ http://www.fao.org/armenia/programmes-and-projects/success-stories/tcparm3302-project/en/; www.ecoglobe.com; https://greenlane.am/en/home/

Reliability of the evaluation level

☐

Interpretation of the reliability level

The level of reliability is based on the representation of the information used, coverage, accuracy and, in some cases, limited quantity

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Գնահատման աջակցության համար մոնիթորինգի տվյալների համարժեքությունը

☐ the monitoring of the given NT is not complete, only part of the territory or problem

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National Target 9: Strengthen cooperation between state institutions and the civil society; raise awareness of the population about biodiversity issues.

☐ Progress is available, but the pace is insufficient.

Additional information

At the present stage of the country's development, some positive progress is observed in public participation in the decision-making process, and the decline in indifference to the community's problems, but there are still many cases when population participation in the environment, particularly biodiversity conservation programs and events, is formal. In the Republic of Armenia, the neglect of the principles of the

socioeconomic development programs in the various spheres, lack of cohesion among the ongoing processes in the country, low awareness of the decision-makers on the issues of the Convention, the low level of ecological education of the population, lack of ecological culture.

In recent years, a number of legislative reforms have been carried out by Armenian legislative and executive bodies in the field of ecological education and upbringing of the population, as well as in dissemination and awareness raising of environmental information, which highlights the importance of the Government of the Republic of Armenia for 2018. "Strategy for Environmental Education and upbringing", approved by the N 7 protocol. The aim of the strategy is to improve the environmental education, upbringing and awareness-raising system in Armenia, the expansion of cooperation between the state, society and international institutions in this area aimed at improving the quality of ecological education, raising public awareness and forming an ecological awareness of the society that will ensure responsible behavior in all forms of individuals and society attitude toward the environment. In order to implement the environmental education and upbringing strategy, the Ministry of Nature Protection of Armenia has developed a strategy program that is under discussion.

Obviously, there is a need for adequate information to respond to the environmental problems and to build trustworthy relationships between the public and the state, and its effective use implies trained and informed human resources. At present, non-formal education of professionals in various fields is mainly carried out to enhance their professional qualifications, ignoring environmental issues that are indisputable on the processes of sustainable development in the country.

One of the key goals of the Global Environment Facility (EFCA) and the UNDP-funded "Creating Global Environmental Benefits through Environmental Education and Awareness Raising by Interested Parties" (2015-2019) is to raise environmental awareness and public awareness. The project aims to expand the country's capacity to use environmental education and knowledge as tools for the development of global and national environmental benefits, as well as for the better implementation of the Rio Conventions strategies. Within the framework of the program, environmental education

training courses have been developed for decision makers in ministries, state bodies, regional government and local self-governing bodies. The package includes a wide range of environmental issues, including Armenia's environmental challenges and opportunities, sustainable agriculture, sustainable cities, sustainable forests and biodiversity, etc.

In 2018, a "green" labor market assessment was conducted within the framework of the Integrated Biodiversity Management Program in the South Caucasus, during which it became apparent that there was a major discrepancy between employers' expectations, needs and skills developed by the educational system in the biological field. Inadequate links between the "green" labor market and the education system can not provide stable and significant results, and additional signals are required for their momentum. Educational institutions, the units presented in the labor market, the government, or these three units can co-operate through the development of new programs, initiatives and new policies.

Throughout the years, various training programs and donor activities have been conducted within the framework of international donor-funded projects, covering specific environmental issues (forest use, protected areas, ecotourism, Kyoto protocol, reduction of vulnerability to climate change, etc.). However, sectoral issues related to the conservation of biodiversity and, in particular, biodiversity price-related issues are scarce in the year-round work with the population, as well as in the environmental education and upbringing and media campaigns. As a result, the low level of awareness for the right decision-making, the inadequate research and the inadequate knowledge base, the incomplete perception of biodiversity and ESs hinder the processes that can limit the further loss of biodiversity and the destruction of natural capital.

Measures to raise awareness about the value of biodiversity have been implemented by the Global Environmental Facility (UNFPA) Regional Program for the Improvement of Livelihoods through the Protection and Use of Agrobiological Diversity in Armenia by 2016-2019. In particular, a wide range of public awareness and training materials have been prepared, including: "Plants in the environment", "Agro-diversity conservation", "Loss and resettlement of plant habitats", "Right to participate in decision-

making process of local self-governing body", "Traditional farming" Best Practices for Conservation and Use of Agrobiological Diversity "," Wild Fruit and Shrubs "," The Importance of Development of Genetic Banks in Armenia "," High Crops and Wildlife akitsneri Processing Guide "," Food, nutrition and agriculture-related Millennium Development Goals "published educational materials and manuals. Trainings on "Development of Value Chain for Agrobiological Diversity" were organized.

A number of non-governmental and international organizations also carry out activities aimed at raising awareness of biodiversity awareness, biodiversity pricing and activities, status and trends in the field. Among them are.

1. The WWF / Armenia Wildlife Fund (WWF) Armenia, whose projects are aimed at the development and strengthening of Armenia's protected areas, the protection of endangered species, the restoration of ecosystems, the introduction of economic mechanisms in local communities and the creation of alternative livelihoods, and sustainable conservation of biodiversity. as well as raising the level of environmental awareness and ecological education.
2. Since 2002, on the initiative of the Ministry of Nature Protection of Armenia and with the support of the OSCE Office in Yerevan, 15 Environmental Information Centers (Aarhus Centers) have been set up in Armenia. The mission of the Centers is to establish links and other necessary mechanisms for the dissemination of environmental information and public participation in the discussions on environmental issues between public authorities and non-governmental organizations and other stakeholders (local self-government bodies, business sector, academics and mass media). As part of the implementation of the Aarhus Convention, Tukhmanuk gold-polymetallic mine, located near Melikgyugh, can serve as a result of a number of environmental, social, health and industrial safety issues and the negative impact of mine action on the mine's future activities. Being aware of their right to access information and participate in the decision-making process regarding the community's environmental issues as defined by the Aarhus Convention, the residents fought for their right to live in a safe and secure environment. At present, mine exploitation is suspended.

3. The Scientific-Educational Center of Environmental Law, based on the Yerevan State University's Law Faculty, organizes training courses for the university, other universities, NGOs, journalists, environmental inspectors and judges concerning national environmental law and environmental conventions.
4. The "Green Trail" NGO's support for agriculture is to improve agricultural, environmental and socio-economic situation in Armenia's communities through educational, consulting and investment programs.
5. For the development of organic agriculture, nature protection NGOs organize numerous events in all regions of the country to familiarize themselves with the basic principles and peculiarities of organic agriculture, the benefits of ecologically clean agricultural products, the steps necessary for the transition from traditional to organic agriculture, conditions and requirements of organic farming, fertility preservation, soil nutrition stockpiling of elements, management of diseases and pests.
6. In order to create preconditions for the ratification of the Nagoya Protocol, efforts are being made to raise the awareness of the stakeholders and to consider the national approaches to the protocol. Taking into account the need for a thorough investigation of all positive and negative sides in making a reasonable decision in this issue, the Ministry of Nature Protection of Armenia intends to apply to the international structures for the purpose of providing that technical assistance.

The "Biodiversity Conservation and Sustainable Use" page has been created on the official website of the Ministry of Nature Protection, which is currently in the process of data collection, processing and installation. It also organizes training on biodiversity acquisition for different pupils in different ESDs. In just one year, eco-trainings were conducted with about 800 pupils of community-based schools.

Means used to evaluate progress: state statistical data, state and international programs reports, analytical reviews, scientific articles, thematic research, expert conclusions, results of consultations with business entities, factual data monitoring of partial issues.

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; www.edu.am; http://www.mnp.am/am/post/1888; https://www.giz.de/en/worldwide/20319.html; http://mnp.am/uploads/1/1526479251Bnutyun_oct.pdf; https://greenlane.am/en/home/; http://www.elrc.ysu.am/; https://aarhus.osce.org/armenia; http://armenia.panda.org/

Reliability of the evaluation level

☐

Interpretation of the reliability level

The level of reliability is based on the representation of the information used, coverage, accuracy and, in some cases, limited quantity

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National target 10: Take measures to introduce mechanisms in the inter-sectoral economic relations that will exclude violations of environmental sustainability in the result of the use of natural resources.

☐ Without siginificant changes.

Additional information

As with the economic growth in Armenia, environmental risks are minimized as biodiversity conservation is due to a range of industries, mainly due to the effects of agriculture, forestry, industry, energy and construction, on the nature of flexible mechanisms of cooperation that are capable reduce threats to the socio-economic development of the country. The progressive pace of mining industry expansion, crop rotation, over-exploitation of water resources (due to the rapid development of subsoil water use and climate change), the growing threat of desertification proves that sustainable development can only be achieved by the introduction of "green" innovations, Including through the use of autonomous mechanisms, including

cooperation between the state, the public and the international structures in the ES Assessment.

Establishment of institutional links between the stakeholders plays a major role in the coordinated management of SPOs and their integration into socio-economic systems. The urgent or strategic issues in this area can not be fully implemented by the potential of Armenia's Ministry of Nature Protection or SNPOs that manage SAPs. It is necessary to harmonize and coordinate the actions of the public administration system, local self-governance bodies, international organizations and the private sector.

At present, there are no clear mechanisms of inter-sectoral cooperation in Armenia, as well as the rules for corporate responsibility, biodiversity and ecosystem management, the rules of joint action to overcome risks and possible conflicts. At the same time, before shaping conscientious, sustainable and effective institutional relationships, it is necessary to jointly identify the ways of addressing the existing problems and the range of relevant actions. As a way of establishing institutional ties, the establishment of Biodiversity Conservation and Sustainable Councils at the Ministry of Nature Protection of Armenia may be the key to promoting mutual cooperation and effectively implementing decisions.

Obviously, the proper response to environmental problems and the formation of trustworthy relationships between the public and the state need relevant information, and its effective use implies trained and informed human resources. By ensuring stakeholder participation, it will be possible to contribute to the following issues: implementation of common environmental management policy, effective legislative requirements, overcoming interdepartmental contradictions and systematic solution of existing problems, access to information and systematic exchange.

There are few examples in Armenia where there are discrepancies in different sectoral policies, racisms, programs, and are not coordinated in the socio-economic and environmental activities at the planning and implementation stages, which creates substantial risks for the environment and, hence, for the population. A concrete example of this is the strategy of energy development in Armenia, which gives great importance to the practice of small hydropower plants, not taking into account environmental issues, in

particular landscape, biodiversity, land and water resources conservation. Therefore, it is important to identify strategies in different sectors, from the very first steps in the planning of operations to identify the environment and, in particular, the threats to biodiversity and to identify ways to mitigate them. Certainly these issues are regulated by the Armenian legislation, but the analysis of the documents submitted for expertise and the conclusions drawn from that examination does not always take into account all the circumstances of the case, the potential risks.

For the purpose of coordinating the programs aimed at the sustainable management of natural products, the "Strategic Development Agency" NGO, with the support of the "Integrated Biodiversity Management in the South Caucasus" Project and the World Bank and with the support of the Agricultural Development Fund (GEF), supported by the German International Cooperation Agency (GFAT) The joint project of the CARMAC II project was set up in 2018 as a platform for collaboration in Armenia The effective cooperation between the organizations and activities in the system. It aims to increase the effectiveness of animal breeding programs and investments, which in turn will improve the welfare of farmers and promote socio-economic growth in rural areas. Coordination of programs for natural pastures, pasture and grassland management creates prerequisites for collaboration between relevant stakeholders and organizations in the field and identification and solution of existing problems in order to ensure social and economic development of the communities and contribute to the solution of natural environmental issues.

If Armenia is ready to support realistically the challenges facing Sustainable Development goals, the complicated and interrelated actions required by it require the involvement and strong cooperation of the government, the private sector, civil society, and other actors. In 2017, the National Innovation Center for Sustainable Development has been established by the joint initiative of the Government of the Republic of Armenia and the United Nations aimed at promoting Sustainable Development goals in Armenia. This is the first time that the state jointly with the UN office is creating an innovative platform with a view to promoting the implementation of UN Sustainable Development goals at the state level. 17 Sustainable Development Goals are closely interrelated with

the national reform processes in Armenia, including those currently under development in Armenia's 2030 Development Strategy. The goals are extremely ambitious, the problems are complex and interconnected and require new approaches, new methods, new structures to offer innovative solutions that have a transformation effect. This will be the role of the National Innovation Center for Sustainable Development goals. The Center will serve as a platform for expertise, collaboration and analysis and capacity building of highly qualified professionals to identify Armenia's development potential and speed up the implementation of Agenda 2030. The National Innovation Center for Sustainable Development has presented its 3-year vision, which envisages work in four main directions:

1. Training of highly qualified personnel in education, especially in the government;
2. Behavioral Experiments and Policy-Based Policy Analysis.
3. public-private partnerships through public-private investment mechanisms.
4. measuring impact by using new, large, and generated data.

Means used to evaluate progress: state and international programs' reports, analytical reviews, expert conclusions, outcomes of consultations with business entities:

Relevant web sites, web links, files

www.arlis.am; www.mnp.am; https://www.giz.de/en/worldwide/20319.html; www.arspiu.com/CARMAC-II-PROJECT.55.0.html?&L=0%20_Environmental_%_20_Compliance_%_20Manager; https://www.un.am/up/file/ARMENIA_SDG_VNR_2018_Highlights-ARM.pdf

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Reliability of the evaluation level

☐ based on partial data.

Interpretation of the reliability level

The level of reliability is justified by the limited representation of the used information, coverage, and in some cases.

National target 11: Improve knowledge, scientific basis and technology related to the state and trends of biodiversity, its monetary value, and the effects of its loss:

☐ Progress is available, but the pace is insufficient.

Additional information

Determination of species composition of biodiversity, changes in flora and fauna, causes of their occurrence, and consequences of loss, including the changes in qualitative and quantitative properties of ESs, characterize the degree of stability and balance of living nature and eventually the welfare and healthy lifestyle of the population. The discovery and assessment of the causes of biodiversity problems, and the results of their research on effective solutions are key prerequisites for the prevention of or mitigation of negative impacts on ecosystems. Thematic scientific research and modern technology, in line with the country's key issues, should be particularly focused on addressing practical issues related to the condition and threats of all types of high-class plants, the assessment of the state of the threats and the threats of vertebrate and invertebrate animals, the protection and restoration of ecosystems and their constituents, ecological monitoring.

With regard to this targeted issue, some activities have been undertaken in Armenia: conservation and rehabilitation of species, enhancing the fight against specific threats (poaching, climate change), in-situ and ex situ protection, detailed description of which is given in Section 4, 5th and 6th national targeting issues.

The action plans for the rehabilitation of the main types of endangered species (including Armenian moufflon, leopard, Sevan trout, etc.) have been elaborated and implemented. Extension of such activities should be based on the reliable information for the selection of endangered and declining species listed in the Red Data Book of Armenia (2010). It should be borne in mind that high-tech taxa have been studied very unevenly. Thus, if the Red Book of Armenia has relatively high quality plants, macromolecules and vertebrate animals, then less than 1% of the reproductive organs

have been included. However, most of these endemics are represented in that team, which are more sensitive to degradation of ecosystems. It is necessary to continue the evaluation of previously unrecognized species and other major taxa (moths, lichens, algae), taking into account the received data in the following editions of the Red Data Book. Under the changing circumstances, it is also necessary to carry out the regular revaluation of the species included in the Red Book. Information on this issue is provided in Section 7.

It should also be noted that since the publication of the Red Book of Armenia, some international bird species have changed in Armenia due to the emergence or aggravation of problems at the global level. Particularly, the status increase was observed in seven bird species. In particular, the status of the Steppe Hawk Boat changed due to the protection measures not only in Europe, but also in Armenia. Armenia is an inseparable part of all European activities aimed at reestablishing that kind of population. In the past, only one nesting population of this small predator was known in Armenia, from the Gorayk Primary School in Syunik Province. However, thanks to the ASPB's safeguarding and artificial habitats, the number of deserted Hawthorn Hawks gradually increased so much that they mastered new territories and even began to build the roofs of multi-apartment buildings in Sisian.

Specific efforts should be made to improve the protection of endangered species, which, in fact, is the only effective way to maintain biodiversity. Currently, the number of herbal species preserved in the SPAs does not necessarily include a sufficient part of the country's biodiversity. For example, 282 out of 452 species of high-quality plants registered in the Red Data Book do not have 286 species of 155 species of corpses and 60 of the 153 species of vertebrates. Consequently, a number of valuable sites are still out of the scope of protection in Armenia, which should naturally either obtain a status of new conservation status or, if possible, be included in existing ESIAs, due to the expansion of their borders. The expansion of the existing BSPs and existing BSAPs will significantly contribute to the creation of a national environmental network in the future, based on the principles of landscape planning (see article 5 of the target problem).

Obtaining reliable data for identifying, analyzing and evaluating the biodiversity state and the changes that have taken place requires continuing research and monitoring, which is based on the appropriate level of expertise, structure, methodology, material resources, and financial resources.

In order to address the problem, considerable amounts of research are required that require extensive monitoring system work, presence of information bases, introduction of modern technologies, and financial support for the work. From this point of view, it is possible to play an important role in the study of the impact of anthropogenic factor on the biodiversity of Armenia's biodiversity (2015-2017) and the "Biodiversity Assessment for Biodiversity Monitoring Programs in Armenia" (2018-2020).

For the protection of habitats in forest and water ecosystems, it is important to organize regular monitoring / monitoring. This will allow evaluating the threats, their causes, and elaborating an appropriate action plan. In Armenia, during the past 15 years, large quantitative and uncontrolled deforestation, and structural changes in the field, have little to do with forest biodiversity research. Data collection has not been implemented for a number of reasons: one-third of the forest surface is on the large slopes and is hardly accessible; there are few experts in fauna and flora who work in ESDs or forestry as well as lack funding for periodic forest research.

In the framework of the Integrated Biodiversity Management in the South Caucasus (GIZ), Integrated Biodiversity Management (South Caucasus), studies have been conducted to identify key stakeholders involved in biodiversity monitoring and their capacities. The possible methods of biodiversity monitoring have been studied based on the choice of indicators and the international experience of data collection.

UNDP-GEF "Sustainable Land and Forest Management in Mountain Landscapes in North-Eastern Armenia" (Mainstreaming Sustainable Land and Forest Management in Mountain Landscapes of North-Eastern Armenia) has greatly contributed to the strengthening of institutional capacity of forestry. It focuses on the solution of fundamental issues, including the technology of collecting and processing basic information. Significant results are:

1. Implementation of forest inventory and mapping with the support of geographical information systems, including management planning and monitoring. Particularly, high-resolution satellite images have been obtained for Noyemberyan and Ijevan forest farms. Comparative analyzes have been made between field data and satellite imagery. Borders have been clarified for Artsvaberd, Gugark and Yeghegnut forest enterprises.
2. Modern equipment has been acquired for monitoring, including Go Pro cameras, GPS receivers, Arcpad, communications and more. They were provided to "ArmForest" and "Forest State Monitoring Center" SNCOs.
3. Laboratory equipment was provided to the National Bureau of Expertises for the purpose of conducting dendro-chronological studies.

The Forest Management Information System (NFMIS) is available to key stakeholders who can be active or passive users of the forest management process. It is a powerful database of data and supports the regulation of forest management process. The system was developed by the German Agency for International Development and currently is in the testing phase.

The Caucasus Nature Fund has begun preparations for the development of electronic wood processing system in 2018. It is designed for forest farms and SPOs that, at least, carry out waste dumping. The main idea of the system is to keep the balance of the stored wood volumes starting from the registration until the withdrawal. This system is also designed to interconnect with modern technologies. It is still under development.

There are also work on developing an electronic system for getting amateur hunting and fishing permits. It is funded by the German Agency for International Development together with the Bioresources Management Agency of the Ministry of Nature Protection of Armenia.

The goal of the GATO (2015-2019) (USAID) Program for the Promotion of Advanced Scientific Technologies and Collaboration (GATO) is to reduce the underground water extraction in the Ararat field and to assist the Government of Armenia in developing and

implementing tools to improve the management system, to inform underground water allocation and use decisions based on contemporary scientific approaches.

"Technology Needs Assessment" (2015-2017) / United Nations Environment Program, Danish Technical University (UNEP DTU Partnership) aims to assist countries in promoting technology needs assessment and developing feasible technology action plans by identifying climate change mitigation and adaptation the needs of environmentally sound primary technologies in priority areas.

2018 The adoption of the "Sustainable Technology Introduction Concept" developed by the Ministry of Nature Protection of Armenia and the application of the proposed technologies will help alleviate the ever-increasing demand for water in the changing climate. Developing and promoting climate change adaptability solutions, especially related to agriculture and forestry, are being implemented within the framework of UNDP "Forest and Field Fires Management Program" launched in 2017. As a result of studies using climatic models, a change in the rising conditions of a number of rare species included in the Red Book has been foreseen in Jajur Rally Valley and Sosu Boulevard.

During the annual monitoring of the Ramsar Territories, which are also included in the CNS, a record of bird species and populations, habitat conditions and hazards are included, including both actual and potential impacts. There is a database (both for 2014-2018 and for past decades), which allows to carry out scientific analysis of the general condition of birdwatching in the country, as well as on the quantitative dynamics of population and the impact of external factors on biodiversity. An important reference database for essential materials is also provided by the European Atlantic Atlas 2 (EBBA2) (2013-2020) / MAVA https://www.abcc-am.org/, http://www.ebcc.info/art-480 / and Checklist to Birds of Armenia:

2018 The WWF Caucasus Program and WWF Armenia have initiated a review of the Important Biodiversity Area of Armenia (KBA) as an important Ecoregion in the Caucasus that aims to update the Ecoregion Conservation Plan of the Caucasus (ECP). This work includes the review of internationally endangered taxa on the IUCN Red List, including birds and IDAs. As a result, new sites were identified in the internationally

endangered category, the Priority Ecological Corridors in Armenia and the Priority Areas of Important Biodiversity Sites. The surface of the site was 10,500 square meters. km, which makes up 35% of the territory of Armenia and without the mirror of Lake Sevan it occupies 31% of the territory of Armenia.

Large and up-to-date information on biodiversity is included in "Monitoring of Fauna in Teghut Copper-Molybdenum Mine", RA NAS RA, 2013-2018, Vallex Group and Amoulsar Gold Mine Biodiversity Management Plan, 2018, and Lydian Armenia CJSC Reports.

Modern technologies are used in agricultural development programs aimed at increasing agricultural output, improving land resources and protecting genetic resources (see Targeted Question 8). Among them, subsidizing interest rates for investment of drip irrigation systems, subsidizing credit interest rates for the establishment of intensive orchard gardens cultivated in the Republic of Armenia, and subsidizing loan interest rates for the establishment of intensive orchards cultivated in the Republic of Armenia. Highlights importance of 2018 Scientific project "Restoration of Pomegranate Armenian Precious Ancient Varieties and Development of Effective Methods of Their Management by Modern Technologies", presented by the Scientific Center for Vegetable and Industrial Crops (SNCO), guaranteed by financing as a result of the competition "Scientific Subjects for Contractual Financing of Scientific and Scientific-Technical Activities" 2020). The program envisages restoration of the oldest varieties of tomatoes, which is almost an imperative requirement of the people today and to ensure high yields of these varieties due to the application of modern technologies. In order to solve this problem, From the Vavilov Institute of Horticultural Resources, the valuable varieties of traditional and Armenian selection of Armenian origin preserved in the genom will be imported from the Institute of Horticultural Resources named after Vavilov, which will be put into production as a result of the study of biological and economical properties, inner insufficiency and seed multiplication, and the collection of vegetable seeds will increase with new samples.

According to the Protocol N 3 of 2018, the "State Environmental Monitoring Concept" has been approved, which is elaborated and is currently under consideration

for the "State Program for Monitoring the Development of State Environmental Monitoring for 2018-2021."

Means used to evaluate progress: state statistical data, state and international programs reports, analytical reviews, scientific articles, thematic researches, expert conclusions, actual facts of partial monitoring.**Relevant web sites, web links, files**

Reliability of the evaluation level

☐ based on partial data

Interpretation of the reliability level

The level of reliability is based on the representation of the information used, coverage, accuracy and, in some cases, limited quantity

Monitoring data adequacy for assessment assistance

☐ the monitoring of the given NT is not complete, only part of the territory or problem

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www.arlis.am; www.mnp.am; www.armstate.am; http://ysu.am/science/hy/1463467779; http://www.ysu.am/news/hy/Biodiversity-monitoring-program; http://www.scs.am/files/cank.pdf; https://www.giz.de/en/worldwide/20319.html; http://www.am.undp.org/content/armenia/en/home/operations/projects/environment_and_energy/mainstreaming-sustainable-land-and-forest-management-in-mountain.html; http://www.aspired.wadi-mea.com/hy/5%AB-aspired/; https://www.epiu.am/naxagcer/irakanacvac-naxagcer/A1/; http://1067656943.n159491.test.prositehosting.co.uk/wp-content-sec/uploads/2016/09/Vardan-Melikyan-31.08.2016.pdf; http://1067656943.n159491.test.prositehosting.co.uk/wp-content-sec/uploads/2017/01/12.1TNA-Mitigation-component-31-01-2017.pdf https://www.abcc-am.org/; http://www.ebcc.info/art-480/; https://www.abcc-am.org/downloads.html http://wwf.panda.org/?205437/ecoregion-conservation-plan-for-the-caucasus-revised; https://ecolur.org/files/uploads/pdf/teghutplan.pdf; https://www.lydianarmenia.am/resources/mainFiles/pdf/1df8910b1e9df943edbe92e055e542f0.pdf;

http://www.irtek.am/views/act.aspx?aid=93181;
http://www.irtek.am/views/act.aspx?aid=93247;
http://www.irtek.am/views/act.aspx?aid=93248;
http://www.scs.am/files/Hraman_tematik_2018-04.09-36A-cankov-577158ea456c24ada58ad584eed0b43b.pdf;

National target 12: Enhance the process of training of specialists in biodiversity research and improve their qualification

☐ Without significant changes.

Additional information

The Republic of Armenia, by joining a number of environmental conventions, has undertaken such international commitments as raising public awareness on environmental issues and ways to address them, training and retraining of environmentalists, supporting ecological education, and more. From this point of view, it is extremely important for the development and implementation of effective environmental strategies and measures that state, provincial and local self-governing staff, economic entities are well aware of the nature and content of the environmental management, recognize the challenges that threaten nature at global and national levels, their causes and effects provide the necessary strategic and methodological skills to analyze the existing situation independently, to establish an effective and coherent tsaktsayin relationships with stakeholders. It should be noted that in the many national and international projects implemented and implemented in the country, the human resource development capacities of the environmental sector are always available.

In almost all cases, the study of environmental needs indicates the need to develop state and local self-governing institutions and to strengthen their knowledge and skills. For the purpose of incorporating the provisions and norms defined by the Civil Service Law of the Republic of Armenia in civilian training programs, the "Environment" training program has been implemented over the years, which is definitely needed to adapt to current conditions and environmental challenges. The most alarming situation is in the

provincial and community levels. Municipal servants training programs in local self-governing bodies include topics related only to the authority of community leaders, community service, freedom of information, anti-corruption, and managerial skills. There have been some refinements on the development of community-based environmental issues and community-based programs, only in the Yerevan City Hall's Community Staff Training Program (Social Affairs). Internet and online platforms are not sufficiently used, there are no e-courses in Armenian and other educational resources.

Responding to this requirement, within the framework of the "Environmental Training for Civil Servants and Community Employees" component, "Creating Global Environmental Benefits through Environmental Education and Awareness Raising by Interested Parties", funded by the Global Environment Facility and UNDP, environmental training courses for civil servants of different levels of state bodies, regional government and local self-government bodies atsneri packages that include 11 environmental topics / modules, which can be prioritized in terms of biodiversity conservation following: Global environmental challenges, Armenia's environmental challenges, environmental management (and the global), Biodiversity and Sustainable Forests, Renewable Energy, Sustainable Agriculture.

During the development of each module, ensuring compliance with the Armenian realities was observed in three dimensions:

1. Compliance with Armenian environmental issues;
2. relevance to environmental education needs;
3. Compliance with the peculiarities of civil and community service systems in Armenia.

A series of training courses will be launched in 2019 with the help of trainers who have selected competitions and selected courses for introducing the above mentioned modules aimed at the development of state and local self-governing institutions and strengthening their knowledge and skills.

Obviously, SPOs should be promoting the quality of life of the population by providing services for ecosystems, by introducing non-environmental business activities, creating opportunities for tourism and recreation. Among the commitments undertaken by the CBT, there is a great deal of the capacity of the staff of the SPOs to develop their

capacity at the individual, technological and institutional levels that will enable them to reach an agreed and effective decision. In order to provide a coordinated approach to the solution of the problems, special requirements are sought to the central and local government officials, the BOTA managers and the staff in the area of knowledge, work experience and creativity. For this purpose, it is important to develop and implement environmental education programs that are appropriate for managers and staff of the BP. 2018-2019 With the support of the British Embassy in Armenia, the program "Improving the Management System of Specially Protected Areas of the Republic of Armenia through the Strengthening Capacity of International Cooperation and SNCO Managerial Staff" is implemented. The main objective of the project is to support the improvement of biodiversity conservation in protected areas, which can be achieved through the capacity building of the staff and the accessibility of information on the values preserved by the public. Understanding the existing legislative bases for biodiversity, their status, economic use, regulated tourism and conservation, knowledge of international commitments undertaken by Armenia, monitoring and implementation of sustainable methods of data collection, as well as other key targets for tourism and recreation ideas, significance and potential development Through the acquisition of the necessary knowledge, the project will contribute to the management of SPOs development of human resources.

Means used to evaluate progress: state and international programs, analytical reviews

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Relevant web sites, web links, files

www.arlis.am; www.mnp.am

Reliability of the evaluation level

☐ based on partial data.

Interpretation of the reliability level

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Monitoring data adequacy for assessment assistance

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CHAPTER IV

NATIONAL INTRODUCTION OF THE PROCESS OF AICHI TARGETS FOR SUSTAINABLE USE AND PRESERVATION OF BIODIVERSITY

Target 1. By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Various types of public awareness events, round tables, education campaigns about the importance of biological diversity, its value and tools for its preservation and sustainable use are organized for different target audiences; on-line information resources have been developed. There is probably a need for assessment of the effectiveness of such activities.

The information on the level of public awareness about the importance of nature protection and, particularly, biological diversity, which was obtained through social surveys in 2014-2015 within the framework of Awareness of Environmental Problems as Collateral for Regulating Current Problems program of Prospective Development Center NGO proves the quite low level of awareness and interest of the population towards environmental issues. Among 1600 respondent citizens of the survey, from whom 560 were from the capital and 1040 from Regions, 75,8% were aware about environmental pollution, 64,8% were aware of the distribution and scarcity of irrigation water, 64,1%

knew about air pollution and 55.9% about reduction of forest areas. 70.0% of respondents have little information on issues related to desertification of the territories of Armenia, overusage of artesian water resources in Ararat valley (69.4%), exploitation of small hydroelectric power stations (67.8%), preservation of fauna and flora species in nature reserves (65.8%). Main sources of information are mass media, especially television and news web pages. In fact, the position of the Ministry of Environmental Protection and local self-government bodies was assessed as passive, hence they don't raise the awareness of the population on environmental issues and on planned or current programs. As a solution of the issue it is suggested to broadcast a series of TV programs on environmental issues not only focusing on the issues related to environmental protection but on their regulation communicating corresponding knowledge.

The implementation of the given Aichi target is closely interrelated with the ecological education of the population and the upbringing of the younger generation, as well as with the improvement of the legislative framework supporting raising awareness and dissemination of information on environmental protection. For this purpose, 2 new laws were adopted, 7 Government of Armenia Decrees were ratified and one strategic document was approved in the reporting period:

1. Armenia's Law on Making Amendments and Modifications t the RA Law on Ecological Education and Upbringing of the Population (HO-42-N, February 7, 2017) – the goal of the law is to clarify the main principles of state policy on ecological culture and continuous ecological education.
2. Armenia's Law on Expertise and Evaluation of the Impact on Environment (HO-110-N, June 21, 2014), which alongside with other important provisions defines the new procedure and schedule of organization of public hearings; Strategy on Development of Ecological Education and Upbringing (clause 11 of Protocol Decree N7 of the Government of Armenia Session dated 22 February 2018) – the purpose is to establish stable bases for ecological education, quality improvement, higher level of public awareness, development of the ecological consciousness of the society.

In line with the requirements of ESPOO Convention on Environmental Impact Assessment in a Transboundary Context of United Nations Economic Commission for

Europe and Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, a package of legislative reforms and recommendations was developed in 2015-2017 to raise awareness of the society about EIA and SEA processes, including about dissemination of information regarding the impact on environment, biological diversity.

Assessment of the price value of biological diversity is still on its initial stage and is being implemented within the framework of some international programs via trainings, sessions, round tables etc. Surveys on ecosystem services in the mining sector were conducted only within the framework of Amulsar gold mine project by Lydian company, which were aimed at getting the understanding on the dependence and use of ecosystems by people and assessment of the impact of the project on the mining site. Despite the fact that the surveys are very generalized, they still serve as an important example to be adopted by other private organizations (Lydian International “Amulsar Gold Mine Program –Environmental and Social Impact Assessment”, Chapter 6, Ecosystem services observation).

Currently, we can note a certain positive and remarkable tendency of inclusion of ES and PES ideology in national programs and plans despite the shortcomings and gaps in RA legislation related to this sphere. Improvement of the level of public awareness has been considered an effective tool for ensuring a better understanding and acknowledgement of the importance of ES and PES by state institutions and corresponding agencies.

More than 40 small and large programs on biodiversity preservation which were or are being implemented contain activities targeted at raising the level of public awareness and education. The implementation of these programs resulted in the education, training of and provision of information to the representatives of the society on environmental issues, particularly biodiversity preservation and ecosystem services (see sections 2 and 3 of the present Report).

Target 2. By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems

The implementation of this Aichi target in Armenia is first of all connected with the reinforcement of the concept of ecosystem services, their classification and methodology for their price value assessment in the national legislation. In 2016 certain changes were introduced in the sphere of payments for utilization of natural resources in the Labor Code of the Republic of Armenia, which are mainly also connected with the economic value of ecosystem services and shall be integrated in the economic system of the country. Hence, modifications were made in Chapters 40-41 and 43-44 of Section 10 “Payment for Natural Resources”, as well as in Article 208 on “Tariffs for use of natural resources – biological resources”.

A feasibility study of pilot projects of Payment for Ecosystem Services (PES) in RA was initiated within the framework of “Integrated Biodiversity Management, South Caucasus” program of GIZ together with RA Ministry of Environmental Protection in November of 2018. The study will result in the development of a road map for creation of preconditions for the introduction of the scheme of payment for ecosystem services in two pilot sites. The project will include biophysical study, economic and social feasibility assessment, management aspects of the implementation process and aspects of legal regulation of PES schemes, which will allow to test the outcomes in revision of national and local strategises, namely social-economic development plans of Mazres, as well as management plans of SPNAs and forestry including calculations of the benefits from ecosystem services in them.

Target 3. By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions

Practical application of positive stimuli for preservation and sustainable utilization of biodiversity is possible through the introduction of the system of payment for ecosystem services, application of compensation and encouragement mechanisms contributing to the development of SPNA system, strengthening of the participation of the society in the sphere of management and development of capacities for sustainable management of natural resources. ES payments are considered direct and flexible mechanisms of encouragement envisaging monetary compensation directly by the user to the physical entity or community providing ecosystem services, whose decisions precondition the provision of these ecosystem services in the sphere of utilization of natural resources. Mechanisms for promotion of reproduced resources are a priority for Armenia, namely in terms of recovery of forests, which are important as both a habitat for species and a source of ecosystem services.

Activities directly or indirectly supporting the preservation and sustainable use of biodiversity, as well as encouragement and compensation mechanisms are applied in Armenia with financial assistance from various international programs:

1. Support to development, preservation and commercialization of products and services dependent on biodiversity and ecosystems – as per the example of satisfaction of the need for household firewood in 4 communities in the neighborhood of Shikahogh state reserve;
2. Development of sustainable tourism or ecotourism as per the example of a number of SPNAs;
3. Support to management of community resources: provision of forest debris to communities in the vicinity of forests free of charge. For example, 66 614 sq.m. of debris firewood was provided to the population in communities in the vicinity of forests in 2017;
4. Application of SPNA participation management models as per the example of “Gnishik” preserved landscape;
5. Improvement of socio-economic situation in target communities located within the borders of eco-corridors connecting preserved areas: for 26 target communities in RA Ararat, Vayots Dzor and Syunik Regions.

A number of programs towards targeted use of land resources are being implemented in the country in recent years. Through state support programs land users are provided with assistance in effective use of sowing areas and development of agricultural systems.

The levers applied are as follows:

1. Partial subsidies for loan interest rates,
2. Improvement of loan conditions,
3. Supply of agricultural equipment via leasing mechanisms,
4. Provision of affordable targeted loans.

The following is implemented through the application of the mentioned mechanisms:

1. Development of agricultural systems in border regions: provision of winter crops to land users of 37 bordering settlements free of charge through state assistance;
2. Use of hail protection nets, which are a stable guarantee for high quality harvest, reduction of the harms caused by natural disasters and alleviation of climate change risks in the sphere of horticulture development through the application of subsidies for targeted loan interest rates;
3. Installation of hail protection net systems in approximately 395 hectare vineyards and orchards annually through the technical support from FAO and funding from European Union;
4. Promotion of intensive establishment of orchards for fruit and berries via provision of affordable targeted loans, which supports the development of horticulture, increase in the volumes of fruit and berry production, replacement of import and increase in the volume of export, as well as for the reduction of non-cultivated land areas – for example, areas of fruit and berry orchards increased by 381 hectares as compared to 2014;
5. Prevention of further spread of phylloxera in vineyards and alleviation of its damages through technical support and funding from FAO.

More detailed information on all the above-mentioned actions and programs is provided in Section 3, Aichi Targets 4-8.

Target 4. By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits

This important target involves almost all areas of economic activity and includes activities aimed at transition to a green economy in terms of efficient management of resources, creation of cleaner production.

In 2014, the National Assembly of Armenia passed the RA Law on Environmental Impact Assessment and Expertise, which clearly sets out the rights and responsibilities of initiators in the environmental impact assessment and expertise processes, as well as environmental impact assessment and expertise of "... flora and fauna, their species and conditions of existence, use of the flora and fauna, the use of living modified organisms, animals or plants registered in the Republic of Armenia Red Books" while planning and implementation of entrepreneurial activities. Enforcement of the law enables avoiding the risk of non-sustainable use of resources at the initial stage of entrepreneurial activities, as well as preventing respective forms of activities (mine exploitation, etc.) in certain areas, where valuable biodiversity representatives, landscapes, species registered in the Armenian Red Book of Animals and Armenian Red Book of Plants are available.

In 2014, the methods of assessing monetary ratios of the damage caused as a result of environmental pollution and exploitation of natural resources were analyzed by the Regional Environmental Center in the context of strengthening the responsibility regimes in the Caucasus Region through the Report on Liability and Environmental Damage, Assessing the Economic Values: Methodology, Framework, Criteria, Application.

In line with this Aichi Target, using the proven preventive environmental approaches, such as reduced environmental impact and improved public health and safety (less waste, emissions and pollution) the principles of efficient use of green economy, resources and clean production have been introduced in more than 90 SMEs, farms, companies dealing with agricultural production, chemicals, production of construction materials. Understanding and attaching great importance to the topicality of the problem the establishment of a National Center for Green Economy has been recognized as a priority by the Government of Armenia in 2017. It will promote the

efficient use of resources and organization of clean production by legal entities and individuals (SMEs, representatives of businesses, industrial, manufacturing companies, farms, etc.). The Concept on the Center for Green Economy and Effective Use of Resources and Clean Production was also developed.

Target 5. By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced

In order to reduce degradation of the ecosystems being of great importance for Armenia, improve the situation and introduce sustainable forest management approaches various activities have been carried out within the framework of national and international programs in Armenia that are detailed in Chapters 2 and 3 of this Report.

According to 2011 data obtained by the GIZ through remote sensing method the area of forests in the Republic of Armenia makes 332 333 hectares or about 11.17% of the total territory, including ca. 283 thousand hectares of natural and ca. 50 thousand of artificial forests. In 2017, activities accompanying the forest sector reforms in Armenia, including institutional improvements of forest protection and management systems were commenced. In 2018, changes were made in the state authorized body for forests; "ArmForest" SNCO was transferred to the structure of the Ministry of Nature Protection, a State Forest Committee and Department of Biodiversity and Forest Policy under Armenia’s Ministry of Nature Protection were established. By enhancing and clarifying the mandate of the Ministry of Nature Protection it is planned to stabilize, improve and develop the management system for forest preservation, protection, reproduction and use, improve the efficiency of fighting against illegal felling, ensure comprehensive forest management through ecosystem approach in line with international principles. Reforms in the forest sector are currently in progress.

The initiated measures aimed at eliminating the existing threats in the forest sector are aimed at legislative and institutional changes, wide use of alternative and renewable energy sources, introduction of sustainable forest management principles, development of the forest monitoring system, raising of population awareness.

Particularly importance is given to the following programs implemented or being implemented for the improvement of forest and pasture management:

1. Forest inventory and mapping activities with the help of GIS systems, i.e. obtaining of high-resolution satellite imagery used in comparative analysis of field data and satellite images, clarification of some forest boundaries;
2. National Forest Management System (NFMIS) was introduced, whish is a powerful database and supports the regulation of the forest management process. The system was developed at the initiative of GIZ and is currently in the testing phase;
3. Development and introduction of principles for the design of forest felling prevention system and mechanisms for targeted use of financial resources allocated for the protection of forests;
4. Enhancement of forest monitoring activities by providing up-to-date equipment (Go Pro cameras, GPS receivers, Arcpad, communication devices, etc.);
5. Implementation of solar energy technologies to reduce the population's dependence on firewood; this will provide opportunities for reducing the pressure of neighboring communities on the forests;
6. Building of capacities for rapid response to wildfires, forest pest monitoring and application of environmentally friendly means against them;
7. Development of standards for determination and evaluation of forests ensuring high ecological, socio-economic and biodiversity conservation in Armenia, which lays methodological basis for conservation of biodiversity and determination of valuable forest areas important to the local population;
8. Expansion of reforestation activities. Overall, in 2004-2016, reforestation and afforestation activities were implemented in an area covering 3174.2 hectares and in 2017 – 423 hectares. According to the data of "ArmForest" SNCO website the forestry branches carried out tree-planting works on 120.3 hectares, which means the lion's share of reforestation activities is performed with the efforts and financial resources of international organizations;
9. Implementation of the commitments under the Paris Agreement for Climate Change (2015) signed by Armenia through limiting the greenhouse gas emissions within the limits of 633 million tons and increase forest cover up to 20.1% by 2050.

Target 6. By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems

The main fishing pool of Armenia is the Lake Sevan with its fishery stock being an important resource for the local population as it is an indispensable tool for trade, food production and tourism development. In 2017 whitefish stock has increased slightly in the Lake Sevan, however, it was 14 times smaller than the previously registered maximum values. Scraper, barbel, and carp stock, as well as crayfish production stock have sharply declined. The decline of biological reserves of the lake has also affected the well-being of the Gegharkunik region population, particularly, those engaged in fishing and crayfish hunting.

Due to the monitoring and project research implemented for the registration of fishing stock and evaluation of reproduction conditions for the main fishing species (whitefish, crayfish, trout) the following was revealed:

1. In recent years, along with the increase of the Lake Sevan level there is a growth tendency in the total fish stocks. As compared with 2016, in 2017 the total fish stock increased by 16.7% making 2281 tons;
2. The dominant fish species in the lake is the whitefish the ratio of which increased in 2017 as compared with 2016 making about 97% of the total fish stock;
3. During 2016, 921,000 Sevan Trout fingerlings were released into five main rivers (Karchaghbyur, Lichk, Tsakkar, Argitchi, Masrik) serving as spawning place for the Sevan Trout;
4. Among the factors that affect the conditions of the natural habitats of endemic fish species in rivers serving as spawning place for Sevan and endemic fish species (Sevan trout, barbel and carp) are organic pollution (as a result of water flows from pastures and dwellings), intake for SHPPs and irrigation, as well as, in some cases the violation of natural river bed structure.

Within the framework of Restoration of Sevan Trout and Development for Aquaculture Project commenced in 2016 it is planned to restore the trout stock in the

Lake Sevan by creating conditions for natural reproduction of the stocks of endemic types, organizing ecologically sustainable production and developing the whole value chain. In order to develop a natural system and ensure stable and rapid recovery of the endemic species of Gegharkuni and Summer trout every year about 25% of fingerlings going to the farms located in the lake will be released into the lake with the resources of such farms.

Certain restrictions on industrial hunting[3] of specific species and their quantities (carp, crayfish up to 500 tons) have been imposed in 2018. New equipment criteria and terms have been set out for the industrial hunting of fish and crayfish. During the spawning and reproduction of crayfish the crayfish hunting is temporarily stopped in the Lake Sevan.

As a result of approving the Draft Law on Making Amendments and Modifications to the RA Water Code the construction of SHPPs on the rivers having spawning places of endemic fish species registered in the Red Book of Armenia or typical to the area, in protected zones of special conservation areas, within 150 meters from natural monuments, water ecosystem protection zones will be prohibited.

Target 7. By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

Territories included into the agricultural sector of Armenia and considered of high importance and in need of environmental protection and sustainable management, are the natural rangelands, i.e. pastures and grasslands. Approximately 59% of agricultural land registered in the country are natural rangelands that occupy about 1 244 000 hectares. Large rangelands are may be found in Lori, Tavush, Aragatsotn, Shirak and Gegharkunik regions. Due to the long-lasting inefficient use and lack of care approximately 150 thousand tons of natural rangelands were left out of agricultural use.

[3] ORDER NO 10-N OF MINISTRY OF NATURE PROTECTION OF ARMENIA ON DETTING OUT QUANTITIES OF INDUSTRIAL HUNTING IN WATER AREAS OF TE REPUBLIC OF ARMENIA dated 19 January 2018 http://www.irtek.am/views/act.aspx?aid=93751

Findings of the recent researches and projects implemented with international funding have shown the following:

1. Increase of pasture efficiency is directly linked to their efficient and balanced management;
2. Protection of pastures, recovery, reduction of their biodiversity vulnerability risks is a key to the development of agriculture, particularly livestock;
3. The rich gene pool of pasture ecosystems, that is wild relatives, endemic and rare species of cultivated plants is an important constituent for the country's agricultural biodiversity, the substantial decrease of which is caused by the breach of rangeland utilization norms and over-use of a number of species by people.

Actions aimed at reducing threats in this area are the following:

1. Development and testing of functional model for improving pasture management in Armenian communities – for improved pasture management planning and implementation methods, studies on changes in vegetation and environmental indicators in 63 community pastures have been carried out under conditions of anthropogenic impacts of different degrees;
2. Representatives of 24 Syunik communities were trained in pasture monitoring and management plan development and implementation; pasture monitoring was conducted, pasture management plans were developed for 19 communities;
3. Efficient cooperation platform was introduced for effective coordination of activities between the organizations operating in Armenia’s rangeland management sector and improved efficiency of animal husbandry projects and investments.

Around 10 years ago the Armenian Government declared the fish industry as a priority field in the agricultural sector. The profitability of aquaculture has led to the rapid development of this sector. Fish production ratio in 2009 was 6,0 thousand tons versus 15,6 thousand tons in 2013. Currently, about 16.0-17.0 thousand tons of fish is produced annually in the country with 20-30% of which being exported. 65-70% of the produced fish make valuable fish species (salmon, sturgeon); assortment containing 15 species is comprised of local and imported types.

The sustainable fishery management is closely connected with water supply of fisheries being performed through spontaneous wells. From an artesian well operated with the use of a pump it is possible to pump out maximum 60-100 liters of water per second, whereas the capacity of spontaneous wells is 250-600 liters of water. Out of the legal wells used in unsustainable fishery development conditions 300-400 million cubic meters of water was being taken annually that led to the decrease of groundwater levels. According to Armenia's Prime Minister's Decree No 413-N of 2017 on Approving the Action Plan for Effective Water Resources Management in Ararat Valley the process of liquidation or conservation of illegal wells (see the previous sections) has been developed, as a result of which the groundwater level in the Ararat valley has increased by an average of 2 meters.

Under such circumstances, it was necessary to reduce the amount of water used for fish breeding, maintaining the quantity and quality of fish produced. In 2017, the program for Alternative Water Use in Fish Breeding in Armenia was developed aimed at technical planning of water utilization system in accordance with local conditions and introduction of a water resource recycling system by providing traditional farms with technical support.

Another form of aquaculture is the Complex Program for Recovery of Trout Stock and Fish Breeding Development in the Lake Sevan launched by "Sevani Ishkhan" company in 2014. The program is still under implementation. Details of this program are presented in the previous section.

Water saving, along with the liquidation of illegal wells, can be performed by introducing the water saving system already used by Bigama-Fruit LLC. The latter makes possible to increase the volume of fish production in the conditions of the same water intake.

Reasonable reduction in forest felling was determined as an essential objective for sustainable forest management, which is crucial not only for biodiversity conservation, but also in terms of adaptation to climate change. Firewood remains the main source of heating for the population of forest-neighboring areas due to access to firewood, high energy prices, low solvency of socially vulnerable layers of populations. As an energy

resource in Armenia, the firewood together with the biomass makes 5.1% of the energy sector. This is a huge burden on forests. Modern alternative to firewood would be solid fuels - pellets, briquettes, involving small and medium businesses and encouraging them with subsidized loans.

A number of legal acts adopted in 2014-2018 establish prerequisites for the sustainable management of Armenian forests and forest biodiversity, among which are the following:

1. Armenia's Law on Making Amendments and Modifications to the RA Law on Compensation Tariffs for the Damage Caused to the Fauna and Flora as a Result of Environmental Offenses" (2017), which provides that tariffs for compensation of the damage caused to each individual case of hunting and/or destruction of flora an fauna species registered in the Red Book. The Law sets out fines not only for vertebrate but also for invertebrates, which is a good tool for the protection of rare and endangered species. Due to the sustainable management of the forests of Armenia and due to the tightening of administrative measures for illegal felling tariffs were envisaged for the compensation of illegally stocked firewood and products made of wood detected outside the forest territory or during its transportation;
2. By its Decree No 860-N of 2016 the Armenian Government approved the procedure of protecting, safeguarding, using the fauna objects (hunting grounds) and the list of hunting grounds and their respective schemes by regions, hunting areas included in the list of hunting grounds were clarified by establishing legal grounds for reducing the pressure on biodiversity in other areas.

At the result of implementing international projects and cooperation, sustainable forest management activities have been implemented, including the following:

1. EU-funded European Neighborhood and Partnership Instrument Eastern Countries Forest Law Enforcement and Governance II Program (ENPI FLEG 2) has improved the forest management through enhancing forest policy, legislation and improved efficiency of institutional structures and piloting sustainable forest management models. Within the framework of the project a comparative analysis of sustainable forest management practices and sustainable ecosystem management was carried

out; relevant recommendations have been made to promote the sustainable management of ecosystems in the current forest management system and the formation of the economic system of ecosystem services. At the result of the analysis, a roadmap has been developed for future revision of legislation, policy and management systems.

2. Sustainable Forest Management, as a mechanism, is currently under development in the framework of the UNESCO-FAO Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia. The development of national sustainable forest management standards is underway that will enable application of sustainable forestry principles if approved by the legislation.
3. Within the framework of 2015-2016 EU/WWF Pilot Project on Identification, Mapping and Evaluation of Forests with High Conservation Values (HCVFs) in Armenia the standards for identification and assessment of forests with high ecological, socio-economic, and biodiversity-keeping value have been developed and pilot tested that support in the sustainable management of the forested areas of significant and irreplaceable importance;
4. At the initiative of GIZ a Forest Management Information System (NFMIS) is being developed, which will be the first step in terms of making diverse information on forests more reliable and transparent; this is undoubtedly a powerful database.[4]

Target 8. By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

The main sources of pollution for water and land resources in Armenia are industrial, especially mining and household wastewater, fertilizers and pesticides moving from agricultural fields with snow and rain, as well as solid household wastes. In 2017, the monitoring of the quality of surface waters in Armenia was carried out in 43 rivers from 103 observation points, in 6 reservoirs from 6 observation points and Lake Sevan from 17 observation points; Armenian-Iranian joint monitoring of the Arax River's pollution level was also conducted.

[4] Additional information can be found in chapters 2 and 3 of the report.

One of the ways for addressing the problem are legislative amendments aimed at the following:

1. Re-cultivation and restoration of devastated lands;
2. Ensuring the recycling of mining waste;
3. Prevention of groundwater and aquifers pollution by mines.

The Natural Resources Management Strategy Program (2018-2025) includes inventory of pollutant waste to reduce and neutralize pollution, as well as monitoring of soil pollution and other negative impacts on the soil at a result of soil exploitation.

The main reason of biogenic pollution are household wastewaters. The main means of preventing leakage of pollutants and biogenic elements is the construction of wastewater treatment plants, especially in the towns and tourist zones of Gegharkunik province.

In the annual plan of restoration, preservation, reproduction, natural development and utilization of Lake Sevan ecosystems approved by the Government of Armenia it is planned to implement important projects on Measures to Prevent and Control Illegal Landfill Generation; Re-cultivation of Landfills Subject to Liquidation According to Inventory Data" and "Landfill Improvement and Regular Garbage Collection" that are aimed at reducing the amount of water pollution sources.

In order to reduce the threat of environmental pollution in agriculture, projects contributing to the development of organic agriculture are being implemented.

The Elimination of Obsolete Pesticides Stockpiles and Addressing POPs Contaminated Sites (GEF/UNDP, 2015- 2019) seeks to solve the problem of accumulating hazardous waste and expired pesticides by elimination of pesticides that are not suitable for use and decontamination of sites infected by persistent organic pollutants. Particularly, within the framework of the project it is envisaged to eliminate about 900 tons of pesticides in Nubarashen burial site and other chemical waste in the other 24 warehouses of the country, as well as to neutralize 7100 tons of polluted soil at Nubarashen burial site.

Target 9. By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment

Recent studies in Armenia revealed that the density of populations of alien species has increased; anthropogenic transformation of territories and the temperature increase contributes to the penetration of alien species. Invasion of alien species leads to a change in biodiversity species composition in natural habitats with the indigenous species being expelled from their natural habitats.

Since 1960 the number of fish species in Armenia has grown from 24 to 40. In 2010, Puregosaura parva and Alburnoides bipunctatus armeniensis was detected in the Lake Sevan for the first time. The latter species have become dominant and occupy the ecological niche of the endemic species of river and lake-river forms. In 2017, for the first time in the waters of Armenia river eel (Anguilla Anguilla) was found.

Changes are observed also in the insect fauna. In 2016, in north-western part of Armenia lady beetle Harmonia axyridis Pall (Coleoptera, Coccinellidae) was registered whose penetration pathways are not identified. The list of quarantine insects in Armenia includes 8 species, and the number of missing but anticipated insects is also 8 species for stocked products, and 7 species of potentially hazardous quarantine pests for greenhouse plants. In case of detecting new quarantine foci of harmful organisms, the Government of Armenia is announcing quarantine, demarcating the area infected with harmful organisms and measures aimed fighting the pests are taken by the Ministry of Agriculture of Armenia.

In the case of invasive and expansive plants, it is more alarming the spread of 77 aggressive species, 38 out of which have already penetrated into the natural ecosystems and threaten local herbal diversity. In 2015, Grindelia squarrosa (Pursh) Dunal was identified as a new breed in Armenia, which being spread in the United States and South America has invaded the Balkan Peninsula, the Baltic States, Fore-Caucasus, South Asia and is considered an invasive species for Armenia. The Red Book species Clematis vitalba has been demonstrating invasive potential in the recent years rapidly spreading in the Ijevan region. These two species should be included in the list of invasive plant species of Armenia.

More detailed information on this target is provided in National Target 5 under Section 3.

Target 10. By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning

Since joining the Framework Convention on Climate Change the Republic of Armenia is actively involved in the prevention of climate change and on the application of policy and strategic approaches to the unconditional fulfillment of the country's international commitments. As a result of ecosystems and climate change assessment comprehensive analysis has been carried out resulting in forecasting of many changes, such as the reduction of Alpine fauna and wetlands, transition of alpine meadows to meadow-steppes, transformation of dry steppes to the frigonoids, expansion of desert ecosystems and soil salinization. The forecasted climate change also affects forest ecosystems having negative impact on the deterioration of sanitary conditions, massive spread of vermins and diseases as well as increased fire hazard.

As a result of climate change and with the forecasted increase of water temperature by 3-4°C the aquatic ecosystem of the Lake Sevan may change leading to problems connected with seasonal migration of fish, change of spawning and feeding areas, increase of heat-loving low-quality species that will damage other indigenous fish species.

The RA Government Protocol Decree No 49-8 of 2016 sets out the 2017-2021 Action Plan on implementation of commitments and provisions stemming from the Framework Convention on Climate Change and the Paris Agreement with the appointment of responsible agencies. Armenia continues its activities aimed at including the climate change issues in national and sectoral development policies.

National actions implemented under the FCCC are primarily aimed at reducing carbon dioxide CO2 and hydrocarbon CH4 emissions through increased energy efficiency and renewable energy sources. In order to support such activities the forest sector reforms implemented in in 2018 are aimed at stabilization and development of the management

system in the field of preservation, reproduction and use of forestry in accordance with international standards. The efficient fight against illegal tree felling and integrated forest management through ecosystem approach are special targets. Detailed information on the implemented projects is provided under National Targets 5, 7, 11, 15 of Section 3.

Activities implemented in the frames of the FCCC and Paris Agreement are targeted at the following:

1. Replacement of non-renewable resources at the expense of renewable energy carriers;
2. Enhancement of reforestation activities for climate regulation and carbon accumulation;
3. Strengthening the fight against wildfires and pests;
4. Development of inter-agency cooperation and coordination opportunities;
5. Strengthening motivated involvement of the civil society in the ongoing process, etc.

Climate change mitigation and adaptation plans for activities/investments enshrined in Armenia as well as identification of cross-cutting issues under other environmental conventions and development of coordinated actions can be considered important.

17 Sustainable Development Goals of the UN, including Goal 13 “Take urgent action to combat climate change and its impacts”, are closely interrelated with the national reform processes in Armenia, including the 2030 Development Strategy of Armenia which is under development now. The goals are extremely ambitious, the problems are complex and interconnected requiring new approaches, new methods, new structures to offer innovative solutions that have a transformation effect. Nevertheless, the prevention of degradation of vital ecosystems for the health and well-being of the population and their biodiversity conservation are among the country's sustainable development challenges.

Target 11. By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other

effective area-based conservation measures, and integrated into the wider landscapes and seascapes

The preservation and development of the existing system of the Specially protected nature areas (SPNAs) is an essential component and safeguard of preservation, as well as sustainable and long-term development of Armenia's biodiversity. All SPNAs in Armenia are managed by the government agencies and occupy 387,084.4 hectares, which makes 13.1% of the total area of the country (including the mirror of the Lake Sevan). Since 2009, the total area of the SPNAs has increased by 88.6 thousand hectares. In general, the category of the natural monument has been assigned to 232 objects in Armenia, and the number of the profiled monuments is 31. In 2017, the Government of Armenia passed the Decree No 190-N on Approval of the 2017-2026 Management Plan for the Dilijan National Park and Governance-Oriented Priority Measures". Since January 2018, the management of all SPNAs has been entrusted to a single authorized state body, i.e. the Ministry of Nature Protection, whose structure has been complemented by the State Forest Committee.

The network of SPNAs in Armenia is continuously growing thanks to the state support, the cooperation of international and local organizations and with the assistance of joint projects of various donors dealing with preservation of biodiversity, international financial organizations and banks. Within this framework the following are being implemented:

- The project of establishing “Tatev” national park,
- The project of establishing biosectoral preserved areas in Syunik Region,
- The project on review of the borders and capacity development of restricted areas in Ijevan and Gandzakar with the purpose of establishing the “Ijevan forest” restricted area on the basis of three forest restricted areas available in Armenia’s Tavush Region;
- The project of establishing “Gnishik” preserved landscape in Vayots Dzor Region as a model for the first preserved area with community governance;

1. Review of the borders of “Erebuni” state reserve affecting on the increased reserve area, which makes 118.75 hectares;
2. The project of establishing ecological corridors between SPNAs starting from the “Khosrov forest” state reserve and stretching to the border with the Islamic Republic of Iran;
3. The project of promoting the sustainable financial resilience of the preserved areas in Armenia, which is aimed towards enhancement of the long-term financial resilience of the preserved areas in Armenia;
4. The project of introducing a system for registration and monitoring of big mammals (Caucasian leopards, Armenian mouflons, and Bezoar goats), griffons, Armenian vipers, and Darevsky's vipers in the “Khosrov Forest” and “Shikahogh” state reserves, “Arevik” and “Arpi Lake” national parks, and “Zangezur” state restricted area;
5. The project on development of the management plan for the “Khosrov Forest” state reserve;
6. The project of establishing an information database and monitoring system in the special areas of conservation in the Republic of Armenia.

Detailed information in relation to this subject is provided in the Sections 2 and 3.

Target 12. By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained

In connection with this problem numerous measures have been implemented in Armenia, such as preservation and restoration of habitats of the species, strengthening the combat against threats (such as forest felling, poaching, and climate change), *in-situ* and *ex-situ* preservation of biodiversity. In particular, the following activities are being carried out:

1. Projects on restoration of endangered species (Armenian mouflon, leopard, Sevan trout and others);

2. Improvement of conditions of the riverbeds which serve as spawning sites for endemic species of fish;
3. Increasing the water level of the Lake Sevan, due to which the natural self-cleaning process of the water ecosystem has improved and, related to that, the condition of numerous invertebrate animals, especially amphipods (*Gammaridae*) and fish, as well as the composition of the bird fauna and the population of some of its representatives;
4. In a number of SPNAs a system for registration and monitoring of big mammals (Caucasian leopards, Armenian mouflons, and Bezoar goats), birds, and reptiles is introduced;
5. Stabilization of the population and increase of the stock of the nesting and migrant waterfowl bird species in the area of the Lake Arpi,
6. The collection of the Seed banks of the NAS of the Republic of Armenia includes specimens of 552 species of 251 types of 51 families.

The collection of “Armenia’s flora and fauna” permanent exposition landplot of the Botanical Garden includes about 1,000 plant species, which makes one-third of the floristic stockpile of Armenia. The landplot exhibits both widely spread plants and those provoking interest from the fauna and geographical perspective, as well as rare and endangered plants species, those deriving economic interest (pharmaceutical, essential oils, ornamental plants and others), wild congeners of technical crops and many other plant species.

Additional information in relation to implementation of activities for this Target is provided in Section 3 of this Report.

Target 13. By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity

Taking into consideration the diversity of genetic resources of plants and animals of Armenia, including the endemic and relict species, the given Target is extremely

important for the country. The rich and unique diversity of wild congeners of technical crops, which is considered to be a part of the national heritage, has essential importance not only for Armenia, but for the entire globe, too, as basis for food security, increase of food reserves, and stability of agricultural production. Therefore, the major problems of preservation of genetic diversity and sustainable use of agricultural plants, domesticated animals and their wild relatives, other species that are valuable from socio-economic and cultural perspectives acquire a progressing importance in Armenia are being settled in accordance with the provisions of international treaties and within the framework of international and regional partnerships.

Since 1993, Armenia is a member of the Commission on Genetic Resources for Food and Agriculture of the Food and Agriculture Organisation of the United Nations (http://www.fao.org/3/I8638EN/i8638en.pdf). Since 2007, Armenia is a member of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) (http://www.fao.org/plant-treaty/countries/membership/en/). The activities implemented within the framework of the FAO's Commission on Genetic Resources for Food and Agriculture and IT PGRFA are coordinated by Armenia's Ministry of Agriculture.

In *ex-situ* conditions, the genetic diversity of plants in the country is preserved in a number of collections (in the form of seeds, live and *in vitro*) at scientific institutions within the framework of research programs funded by public moneys and in accordance with the mandate and objective of activities of each institution. Particularly:

Collections of seeds:

1. The genetic bank of the "Agrobiotechnology Scientific Center" (located in Etchmiadzin town) of the "Armenian National Agrarian University" Foundation, in the conditions of short-term and long-term conservation, preserves 3,135 specimens of genetic resources for food and agriculture, including breeding and traditional sorts and wild congeners of the main (962), legume (550) and vegetable (750) crops. The genetic bank also manages the national catalogue of the specimens preserved in the country's seed collections;

2. At the Flora Seeds Bank of Armenia (located in Yerevan city) of the Botanical Institute of the NAS of Armenia, in the conditions of long-term preservation, 3,500 specimens of flora of Armenia are preserved, including 83 families, 395 classes, and 870 species;
3. The seeds collection of the Plants genetic fund and breeding laboratory (located in Yerevan city) of the “Armenian National Agrarian University” Foundation contains 5,523 specimens, of which 46% are specimens of the wild congeners of technical crops, which are conserved in long-term preservation conditions and working collections. The laboratory is responsible for data registration at EUREISCO and its periodic update;
4. At the "Scientific Center of Vegetable and Technical Crops" (located in Merdzavan village) of the Ministry of Agriculture of the Republic of Armenia, more than 3,800 specimens of the local sorts and populations are studied and preserved in the conditions of short-term conservation;
5. The working collection of seeds of the "Scientific Center of Agriculture" (located in Etchmiadzin town) of the Ministry of Agriculture of the Republic of Armenia is represented by 1,580 specimens of the local and foreign breeding sorts of the soft wheat, barley, lentil, soy, peanut, and chickpea;
6. The Gyumri selection station (located in Gyumri town) of Armenia’s Ministry of Agriculture, in the conditions of long-term conservation and working collections, preserves 820 specimens of the local and foreign breeding sorts and sort specimens of wheat crops.

Live collections:

1. The collection garden of apricot trees, which was established in 2011, consists of 82 Armenian species (of which 73 are represented by old traditional species) and 12 foreign imported species of apricot trees, is preserved by the "Scientific Center of Agriculture" (located in Etchmiadzin town) of the Ministry of Agriculture of the Republic of Armenia.
2. The collection garden of grapes (1.3 hectares), which was established in 2016 and includes around 300 sorts, is preserved on the territory of the "Scientific Center of

Agriculture" (located in Etchmiadzin town) of the Ministry of Agriculture of the Republic of Armenia.

3. The live collection of Armenia's indigenous flora, which is of significant importance and is represented by plants of around 800 species, is preserved at the Yerevan Botanical garden (located in Yerevan city).
4. *In vitro* collection:
5. The *in vitro* collection of the genetic bank of the "Agrobiotechnology Scientific Center" (located in Etchmiadzin town) of the "Armenian National Agrarian University" Foundation, contains specimens of about 10 traditional sorts of grapes and specimens of about 30 sorts of virus-free potato seedling material.

For the purposes of replication and safety of specimens Armenia sends 176 specimens of the sorts of wild wheat, barley, and goat grass to the Svalbard Global Seed Vault.

The specimens of the genetic resources of plants are freely available to users, mostly to breeders and researchers, the genetic banks and research institutes both in the country and abroad. The specimens collected during the joint expedition studies organized periodically are equally distributed among the participants in accordance with the terms of the contracts signed and the terms of the standard contract on provision of the material.

The country implements monitoring of implementation of the Global Plan of Action for the conservation and sustainable use of the Plant Genetic Resources for Food and Agriculture. Armenia participated in the process of developing indicators for the Global Plan of Action for Plant Genetic Resources. In 2015, a report on implementation of the Second Global Plan of Action was submitted by Armenia to the Commission on Genetic Resources for Food and Agriculture in accordance with the new reporting format (new WIEWS (World Information and Early Warning System), www.fao.org/pgrfa).

Being a party to the International Treaty on Plant Genetic Resources for Food and Agriculture, Armenia, for the purposes of making accessible the country's genetic diversity and respective information on the specimens preserved in the national collections, within the multi-lateral system functioning under the Treaty has included

2,504 specimens of the plant genetic resources for food and agriculture and registered them in the European online catalogue (EURISCO).

Target 14. By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable

The effective conservation of biodiversity and the possibilities for provision and utilization of ecosystem services largely depend on the effectiveness of restoration of degraded ecosystems.

There is a tendency for growth of the total fish stock in the Lake Sevan, which in 2017, as compared to the total fish stock for 2016, resulted in an increase of 16.7 per cent, or 2,281 tons. Every year the Government of Armenia through its decrees approves the Annual Action Plan for Restoration, Conservation, Reproduction, Natural Development and Utilization of the Lake Sevan Ecosystems, which defines activities aimed at increasing the water level of the Lake Sevan and conservation and effective management of natural resources of the lake's catchment basin.

Within the framework of the Complex Program on Restoration of the Trout Stock and Development of Fish Breeding in the Lake Sevan, which was launched in 2016, restoration of the trout reserves in the Lake Sevan is envisaged through creation of conditions for natural reproduction of endemic fish species, organization of ecologically sustainable production and development of a complete value chain. Every year, about 25 per cent of the total amount of the produced fingerlings was released into the lake. This type of population nesting in the basin of the Lake Sevan has reached 250. The positive dynamics of the composition and number of bird species was also observed in the Norashen restricted area, which is included in the structure of the "Sevan" national park and Important Bird Area. More detailed information on the current activities is provided in Chapter 2: *Restoration of Degraded Ecosystems on the Example of Water Ecosystems* and Section 3 of the Report.

The priority strategic directions for conservation and utilization of biodiversity, Targets and actions aimed towards realization thereof. In 2015, the necessary strategic approaches were included in the Strategy and National Action Plan for the Domains of Conservation, Protection, Reproduction, and Utilization of Biodiversity of the Republic of Armenia (BSNAP). The forests in Armenia, which provide a series of ecosystem services at the full range and quality, are of significant importance for the purposes of biodiversity conservation and prevention of the negative impact of the climate change and its adaptation. Especially important are the processes for prevention of the forest degradation and rehabilitation thereof. For information on measures undertaken in relation to the forest ecosystems see the National Target 4 and Target 5 of this section.

Target 15. By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and increase of adaptation of ecosystems and to combating desertification

In 2015 Armenia signed the Paris Agreement, whereby the country in particular has undertaken a commitment to limit within the next 35 years the greenhouse gas emissions to 633 million tons, and by 2050 increase the forested areas to 20.1 per cent.

The activities carried out under the FCCC support the reduction of CO_2, CH_4 emissions through energy efficiency improvements and application of renewable energy sources. For the purposes of the climate change mitigation it is necessary to undertake forestation and reforestation activities to increase the carbon dioxide absorption.

For this purpose within the framework of the project Increasing the Resilience of Forest Ecosystems against Climate Change through Forest Transformation in Armenia, which was funded by WWF/EU, transformation of forested areas and planting of about 250,000 trees was carried out in 2011-2015. The transformation of the forest ecosystems is considered to be a means for enhancing the resistance of a natural forest in the conditions of climate change and increasing the ecological value of homogeneous forests. With the support of the German Agency for International Cooperation (GIZ) and

the Norwegian Ministry of Foreign Affairs in 2013-2014 about 184 hectares of forested areas were transformed and about 130,000 trees were planted. The fight against forest pests has also been carried out on the territory of around 17,000 hectares[5].

The project on Mainstreaming Sustainable Land and Forest Management in Mountain Landscapes of North-Eastern Armenia funded by the UNDP/GEF has significantly contributed to the strengthening of institutional capacity of forestry enterprises, including the introduction of technologies for baseline information collection and processing. Activities have been implemented for management planning and monitoring of forest inventory and mapping with the support of geographical information systems. Within the framework of the Clima East Pilot Project in Armenia, with the EU funding and UNDP assistance, Sustainable Management of Pastures and Forest in Armenia to Demonstrate Climate Change Mitigation and Adaptation Benefits and Dividends for Local Communities triggered activities aimed at restoration of degraded mountain pastures and forests.

The project on Mainstreaming Sustainable Land and Forest Management in Mountain Landscapes of North-Eastern Armenia (2015-2020, UNDP/GEF) was implemented with the objective of forests improvement and aimed at ensuring the sustainable management of land and forests in the North-Eastern Armenia and guaranteeing the continuity of provision of the various ecosystem services and promoting the conservation of highly important biodiversity. Small-scale grant activities funded by the above-mentioned project are aimed at reducing the population's dependence on firewood. These include:

1. The project on Solar Power for Energy Autonomy and Forest Conservation in Tavush Region, by means of which the use of the solar energy technologies reduces the pressure exercised on the forests by the neighboring communities. As a result of installation of solar photovoltaic systems and water heaters the use of firewood for heating purposes will be eliminated.

[5] 5. Introducing mechanisms aimed at mitigation of the climate change, Section 2.

2. The project on Introduction of Energy-Efficient Stoves for Conservation of Forest Resources in Tavush region reduces the pressure on the forest ecosystems through local production and commercialization of highly efficient wood stoves in the communities of Tavush Region.

Target 16. By 2015, the Nagoya Protocol on Access to genetic resources and the fair and equitable sharing of benefits arising from their utilization is in force and operational, consistent with national legislation

Armenia has not yet signed the Nagoya Protocol on Access to Genetic Resources and the Fair Sharing of Benefits Arising from Their Utilization of the Convention on Biological Diversity. Nevertheless, with the objective of increasing the stakeholders' awareness, as well as defining further actions in relation to the Nagoya Protocol the respective negotiations and public discussions are planned to be carried out in accordance with the 2016-2020 National Action Plan for the domains of conservation, protection, reproduction, and utilization of the biological diversity of the Republic of Armenia.

Target 17. By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan

Armenia has developed and adopted a number of important national strategic documents aimed at conservation of biodiversity, including No 54 Protocol Decree of the Government of Armenia of 2015, on Approval of the Strategy and National Action Plan for Conservation, Protection, Reproduction, and Utilization of biological diversity of the Republic of Armenia and the Decree No1059 of the Government of Armenia of 2014 on Approval of the Strategy for Specially Protected Nature Areas of the Republic of Armenia, State Program and Measures for the Domains of Conservation and Utilization.

Based on the considerations to mitigate the sectoral threats and effectively organize the management of natural resources, in 2018 the Strategy for management of natural

resources of the Republic of Armenia was adopted, and its objectives include ensuring activities of recycling the waste generated by mining and protection of the groundwater collection reservoirs and horizons from pollution and depletion and preservation thereof. The strategy defines the basic principles of the natural resources management, including the reference to the mining waste generated during the mining activity. The program of measures to ensure the implementation of the natural resources strategy includes inventory of the mining waste and is aimed at reduction and neutralization of pollution (2018-2025), as well as carrying out monitoring of soil pollution as a result of mining activity and other negative impacts on the use of land (2019 and ongoing).

Target 18. By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels

In Armenia, the given Target is related only to the local communities, whose involvement is mainly focused on identification of opportunities for establishing community forests, management of existing SPNAs and development of business plans, and creating prerequisites for establishing community-managed SPNAs. From this perspective, new opportunities are being offered by registration of the protected landscape (the 5th category in accordance with the IUCN indicators) in the SPNAs system envisaged by the Strategy for Development of the Special Conservation Areas in the Republic of Armenia and the National Action Plan, which can contribute to the active involvement of communities in environmental processes. The community involvement will provide that opportunities are offered for development of alternative livelihoods in rural communities aimed at regulated and rationed utilization of livelihood resources.

Through a number of international programs, activities on capacity development and promotion of economic benefits through sustainable land management were

implemented in local communities. Rotational grazing plans were developed for five target communities in Gegharkunik Region, which are aimed at improved management of 7,500 hectares of pastures. Due to the improvement of road conditions, the project provided conditions for relocating the large and small ruminants from community pastures to remote pastures, in order to avoid the overgrazing of community pastures and reduce the soil erosion as a result of the livestock moving, which will help reducing the threat of loss of habitats for plant species, as well as help protect the habitats of threatened species of global and local importance in the mountainous steppes and subalpine ecosystems.

The participation of communities in the strategies and initiatives aimed at conservation and sustainable utilization of biodiversity is an important factor from the perspective of effectiveness of activities undertaken in the country. One of the most important issues is the daily work with the local community focused on conservation of the community's bioresoures and biodiversity, climate change, SPNAs, ecosystem services and awareness and development of skills in terms of sustainable management.

Target 19. By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied

Over the recent years dozens of small and large state and grant programs have been implemented or are being implemented in the country to improve the knowledge on biodiversity, strengthen the research base, introduce new technologies in the field, improve the cost value and performance, as well as status of biodiversity details of which are provided in Chapter 3. The main outcomes of these programs are the following:

1. Innovative solutions for climate change adaptability, especially in agriculture and forestry were proposed;
2. With the use of climate models the scenarios for the change of the growth of some rare species included in the Red Book were forecasted;

3. Pre-requisites for the institutional capacity building of forestry economies have been established through the use of technologies for collection and processing of baseline information;
4. To decrease the growth of groundwater extraction in the Ararat valley, tools were proposed for informing about the decisions on groundwater allocation and use through improved data collection and analysis;
5. Possible methods of biodiversity monitoring have been studied based on the choice of indicators and accepted international data collection practices;
6. Identifying the needs of environmentally sound primary technologies in priority areas for climate change mitigation and adaptation assistance was provided in the technology needs assessment facilitation process;
7. Comprehensive fire extinguishing system has been developed for the application of innovative approaches and technologies to protect special conservation areas from fires.

The following are still in progress:

1. Development of an electronic system for getting amateur hunting and fishing permits. It is implemented with the resources of GIZ together with the Bioresources Management Agency of Armenia's Ministry of Nature Protection;
2. In the most important birding sites, including also Ramsar sites, annual monitoring involves registration of bird species and populations, habitat status and hazards, including both actual and potential impacts;
3. In 2018, the CNF commenced preparatory activities for the development of an electronic wood processing system. It is designed for both forestry economy and special conservation areas that minimum utilize dumping firewood. This system is under development; it is planned to link it with the modern technologies;
4. In 2018, the WWF Caucasus Program and WWF-Armenia initiated a review of Key Biodiversity Areas in Armenia aimed at updating the Ecoregion Conservation Plan of the Caucasus (ECP). This activity included review of internationally endangered taxa, including birds and Important Bird Areas included in the IUCN Red List.

In recent years, there has also been a tendency of weakened threat related to the loss of natural habitats associated with agricultural management.

Due to the development and implementation of a number of state support programs ("Programs for Subsidizing Agricultural Loan Interests", projects for Subsidizing of Interests on Loans Provided for the Introduction of Drip Irrigation Systems, Subsidizing Loan Interests for the Establishment of Intensive Orchards Cultivated with the Use of Modern Technologies in the Republic of Armenia, Financial Leasing of Agricultural Machinery in the Republic of Armenia: State Support for Leasing) there were positive shifts in the use of land resources, specifically, in the use of arable land, by replacing the inefficient and traditional irrigation methods being the reason for land erosion with water-saving and environmentally-friendly technology, recovery of valuable agricultural crops, decorative and medicinal plants with the use of biotechnological methods, rapid and mass production of healthy planting material.

Knowledge, research base and technology improvement in the country, wide shared use, replacement and application still need improvement. In particular, this refers to cooperation between higher education institutions, research centers and industrial organizations, establishment of relevant material bases, developing multilateral partnerships between laboratories, testing facilities, international institutions, state, territorial and local government bodies, higher education institutions, research and academic centers, private sector, mass media and NGOs.

Target 20. By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels

Provision of financial resources for reducing the negative impacts on environment and for efficient utilization of natural resources in Armenia is done from the state budget and external sources. In recent years, due to application of the RA Law on Environmental and Nature Use Payments, the revenues to the state budget for

environmental and nature use payments have significantly increased and, in some cases, reduced the scope of environmental interventions.

Activities aimed at expansion of international cooperation were carried out.

As a result of the financial assistance of donor countries and international organizations, a number of projects have been implemented that are mainly focused on sustainable management of forest ecosystems, organization of reforestation activities involving local communities, creation of new SPNAs (including transboundary) and ecological corridors, preservation and sustainable utilization of freshwater ecosystems, ensuring the preservation of the most important flora and fauna species and their habitats. Cooperation is underway with the global and regional international organizations: the United Nations Environment Program (UNEP), the United Nations Development Program (UNDP), the Global Environment Fund (GEF), the World Wildlife Fund (WWF), the Organization for Economic Cooperation and Development (OECD), the European Union, the German Agency for International Cooperation (GIZ), the German Development Bank (KfW), the World Bank (WB), the Caucasus Nature Fund (CNF), the Regional Environmental Center for Central and Eastern Europe (RECC), as well as a number of foreign countries.

In 2014-2019, the following financial resources were provided to the SPNAs:

2014	2015	2016	2017	2018
AMD 753,644.8	AMD 894,691.1	AMD 889,760.9	AMD 840,198.2	AMD 898,417.7

The following financial resources were provided to the Ministry of Nature Protection of Armenia:

2014	2015	2016	2017	2018
AMD 2,800,974.75	AMD 3,406,215.5	AMD 3,033,902.74	AMD 2,999,690.73	AMD 3,273,949.3

The following financial assistance was provided by the Caucasus Nature Fund:

2014	2015	2016	2017	2018
AMD 180,191.5	AMD 197,534	AMD 211,838.4	AMD 214,071.4	AMD 389,165.5

According to the data of the Ministry of Nature Protection of Armenia the forecast of performance of investment projects in the field of environmental protection in 2017 was estimated at AMD 165,928,102.

The table of comparative analysis on the Sustainable Development Goals, Aichi's targets on biodiversity, and the national targets on biodiversity in the Republic of Armenia.

Sustainable Development Goals	Aichi's targets on biodiversity	National targets on biodiversity in the Republic of Armenia
Target 1. Elimination of poverty	2, 6, 7, 14	1, 2, 4, 6, 8
Target 2 – Zero hunger	4, 6, 7, 13, 18	4, 6, 8
Target 3 – Good health and well-being	8, 13, 14, 16, 18	1, 2, 4, 6, 8, 10
Target 4 – Quality education	1, 19	1, 11, 12
Target 5 – Gender equality	14, 17, 18	1, 2, 4, 8
Target 6 – Clean water and sanitation	8, 11, 14, 15	4, 6, 9, 10
Target 7 – Affordable and clean energy	5, 7, 14, 15, 19	2, 4, 6, 10, 11
Target 8 – Decent work and economic growth	2, 4, 6, 7, 14, 16	1, 7, 10
Target 9 – Industry, innovation, and infrustructure	2, 4, 8, 14, 15, 19	4, 6, 9, 10
Target 10 – Reduced inequalities	8, 15, 18, 20	1, 2, 4, 6, 8
Target 11 – Sustainable cities and communities	2, 4, 8, 11, 14, 15	6, 10, 11
Target 12 – Responsible production and consumption	1, 4, 6, 7, 8, 19	6, 10, 11
Target 13 – Climate action	2, 5, 10, 14, 15, 17	2, 4, 6, 8, 10, 12
Target 14 – Life below water	2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 14, 15, 17, 19	4, 5, 6, 8, 10, 11
Target 15 – Life on land	2, 4, 5, 7, 9, 11, 12, 14, 15, 16	2, 4, 5, 6, 7, 8, 11
Target 16 – Peace, justice, and strong institutions	17	3

Target 17 – Partnerships for the goals	2, 17, 19, 20	9, 10

Amending the Section 5 "The description of the national application of the global strategy implementation for plant conservation" of the 6th national report, in accordance with the decree XIII/27 of the Convention of Biological Diversity, is considered to be optional. Since these strategy targets and solutions to problems have already been reflected in Sections 2 and 3 of this report, it was considered inappropriate to amend Section 5 to avoid repetition.

Section 6 "Additional information on investments by indigenous ethnic groups and local communities" of the 6th national report is also considered to be optional. As on the territory of nowadays Armenia there are no other indigenous ethnic groups besides Armenians, Section 6 of the report was not completed.

CHAPTER 7

UPDATED INFORMATION CONCERNING THE BIOLOGICAL DIVERSITY OF THE COUNTRY (analysis and evaluation of the material presented on https://www.cbd.int/countries)

Since the publication of the 5th National Report on Biological Diversity some changes have been registered based on available updated data on biodiversity.

The territory of Armenia is distinguished by intense speciation processes, as a result of which the researchers of the flora and fauna of the republic often discover new unknown species.

INVERTEBRATES

Tendency of changes in invertebrate animals for the period of 2014-2018 (positive and negative)

In Armenia Invertebrates are represented by a rich variety (more than 17 000) whose level of research is still insufficient.

In the Red Book of the Republic of Armenia are registered 14 species of guts and 2 bilberry fibers and 139 insects. Four of the types of catechism species, Bithynia troscheli, Gyraulus laevis, Regularis and Regularis (Odhneripisidium annandalei) are found in SPNAs and can be considered as more protected.

2014-2018 about 300 types of insects have been implemented, as a result of which 89 (around 60%) of the insects spread on the Ararat Valley are registered in the Red Book of the Republic of Armenia. One of them is an extinct species (EX), 20 of which are in critical condition (CR), 36 are endangered (EN), and 32 are vulnerable (VU). An environmental status assessment was carried out for 24 hazardous species. To register the International Red List of the International Union for Conservation of Nature (IUCN), the International Committee for the Conservation of Species (IUCN SSC) has sent the necessary information for 29 of Armenia's 13 endemic species.

The following results were recorded during the study:

1. 4 new species of beetles have been described, and 33 new species of beetles have been identified for the fauna of Armenia.
2. For the first time in Armenia the dangerous invasive Harmonia axyridis casabase has been registered in Armenia.
3. Melanotus breed beetle collector materials have been reviewed. Three new types of science have been described. Four new species of this species belong to Armenia.
4. There are 183 Geometridae species registered in Armenia, 12 of which are endemic in Armenia, 3 in the Transcaucasus, 1 in the Caucasus and 5 in the Red Book of Armenia.
2. Arctiidae taxonomic analysis was performed. 34 species were identified, 3 of which are registered in the Red Book of Armenia, one is Armenia endemic.
3. Diptera and Cecidomyiidae species have been identified and 25 species have been identified in Ararat province, 8 of which are for the first time in the province, and four species are new to the Armenian fauna. Two new species were discovered in Armenia's Lori and Tavush provinces - three species were registered for the first time in the Lori region. There are 10 species in Gegharkunik province, four of which are

new for the fauna of Armenia, 1 for the first time in Gegharkunik province, and one new species for science, Janetiella convolvuli sp. nov (Diptera: Cecidomyiidae):

4. It has been studied around 29 species belonging to the Diptera dolichopodidae family, Tabanidae (22 species), Simuliidae (8 species), Culicidae (4 species) families. The ecological features of the Anopheles maculipennis Maigen and A.Sacharovi Favre species of the Culicidae (Diptera) family have been discovered in Ararat province.
5. UNDP's Forestry Butterfly Indicator Types Monitoring Program is being developed as a forest ecosystem management tool within the framework of the Sustainable Management of Soil and Forest in the North-Eastern Armenia (2016-2020) program.
6. Atlas of day butterflies in Armenia (2019) is being prepared. The online version of the Atlas of Day Butterflies (https://www.butterfly-conservation-armenia.org/species.html) has already been developed.

Based on available data, the current state of invertebrates, in particular the fauna of the insect, can generally be assessed as stable.

Vertebrates

Tendencies of change of vertebrate animals in 2014-2018 during (positive and negative)

According to the 5th National Report, the vertebrate animals in the fauna of the republic were represented by 549 species, including 93 species of mammals including endemic species 6, 3 endemic. There are currently some changes in the number of birds, instead of the previous 357 there are 372 bird species, one of which is endemic.

1. **Fishes -** 7 species of fish are registered in the Red Book of Armenia. Because of the shortage of water, the population of the Metsamor River and its associated endemic poplars, the Armenian Redwood (Rutilus rutilus schelkovnikovi Derjavin, 1926), has been severely reduced. It is necessary to take steps to preserve the habitats of this species. In addition, from the Araks river basin to the Metsamor River, the species of

Rutilus caspicus and Blicca bjoerkna transcaucasica can be the cause of the loss of endemic species, Armenian gum (Blicca bjoerkna derjavini) and Armenian crust since 2012 as a result of corrosion with species. It is necessary to grant the status of the protected area to the main part of the Armenian reptile in the Metsamor River and the hunting grounds. There is a tendency for growth of total fish stocks in Lake Sevan. So, in 2016, In comparison with that, the fish has grown by 16.7% and in 2017 the total fish stock is 2281 tons. The dominant species of fish in the lake is its caviar, its share in 2016. as compared with 2017 made up about 97% of the total fish stocks. However, it is too early to speak about the complete restoration of the fish lake community. 2001, "On Approval of Annual and Complex Programs for Restoration, Conservation, Reproduction and Usage of Lake Sevan Ecosystem" played an important role in restoring the trout population in Sevan. The 2005-2015 Restoration of Fish Reserves under the Law of the Republic of Armenia a complex program, during which about 3.8 million trout fish were left to Lake Sevan. Nowadays, the bio-organism of the Prince has grown up to 17 tonnes, but natural reproduction is still missing.

2. Ammonia - Two types of amphibians are registered in the Red Book of Armenia. The protection of minor tritium (Ommatotriton ophryticus) is due to the prevention of illegal hunting. Measures to preserve the Syrian pheasant (Pelobates syriacus) population are insufficient as the hawthorn habitats are located in residential areas and are exposed to anthropogenic effects.
3. Reptiles - The number of Armenian viziers has increased in the territory of "Shikahogh" State Reserve when it has become possible to encompass biotopes enclosed by unprotected rocks in the Meghri Range subalpine zone due to the expansion of the reserve area. An increase in the number of Darevskii viper has also been recorded in the eastern part of the Arpi Lake National Park. The biotopes of these 2 species were previously used intensively for agricultural animals as pastures. In the framework of a number of contracts (contracts with Zoology and Hydroecology of the NAS and contracts with the US St. Louis and Detroit zoos), research is conducted on the study of the Armenian Viper, Darevskie Viper, Mountain Raisier, the Mediterranean Sea Ecology study and assessment of the state of habitats through the

use of modern methods radioeletemetric and electronic chips, photo cameras, phenological indicators registration devices).

4. Birds - In Armenia Red Book of Animals (2010) has 96 bird species registered. 18 of them have "endangered" status, 65 of them are "vulnerable" and 13 are classified as "Data Dissertation" (DD) types. At present, the status of many bird species should be reviewed taking into account the changes in their number in recent years. The species composition of birds in Armenia has increased by about 10 species in the reporting period, and currently 372 species are identified, 235 of which are nurseries and 139 are non-destructive species (see Checklist to Birds of Armenia).

The number of Phalacrocorax carbo in the lake has increased dramatically during the current years (ASPB, 2013) due to the increase of Lake Sevan water level in 2011, reaching 250 by the number of nesting populations.Number of Falco naumanni registered in the Red Book of Armenia as "Vulnerable" has also increased. In the Sissian region, about 35 km southeast of the important bird area of the Goris, a new nesting colony was discovered. Until 2014, in 2014, only two colonies of this kind were planted in the MTDC in Armenia, with about 50 nesting pairs. The newly discovered new colony (50-60 nesting pairs) practically duplicated the bulk of bird species populations.

If positive dynamics of changes in quantitative and species composition of birdwatching is observed in Sevan Basin in recent years, the situation is quite the opposite in Ararat valley. In Armash fish-breeding lakes and Metsamor river basin, as well as in Lake Sevan, the results of wintering birds registration in 2017 show that more than 95% of registered birds (21 species) have been counted only in the Lake Sevan basin. The number of ducks in the Ararat valley has dropped sharply, using open water areas, as well as the number of Charadriiformes and Ciconiiformes that use the natural shores.

As regards the International Red List (IUCN), 14 (5%) bird species currently registered in the territory of Armenia are classified as Worldwide Disorder GT (BirdLife 2018). More than half of the population of the Armenian Lion (Larus armenicus) (NT) population in Europe has been planted in Armenia, 3-6% of the population of the Gypaetus barbatus. In addition, the international status of some bird species registered

in the Red Book of Armenia has changed. Particularly, the status has been upgraded to the following types:

a. Strawberry Eagle - Aquila nipalensis (raised to EN level, due to sharp decline in numbers.

b. Blackhead duck - Aythya ferina (raised by VU level).

c. Gray Plunge - Podiceps auritus (raised up to VU level).

d. Ordinary turtle - Streptopelia turtur (awarded by VU status).

e. Leaf vulture - Gypaetus barbatus (rises to NT level).

f. Armenian - Larus armenicus (raised up to NT level).

The Falco Naumanni and Ficedula semitorquata have been moved from the former "extinct" status under “Least Threatened" LC status. Particularly, the status of the Steppe Hawk Boat changed due to the protection measures not only in Europe, but also in Armenia.

5. Mammals - Some positive changes have been made in Armenia over the past five years on the most vulnerable species of mammals. There are more favorable conditions for biodiversity conservation and reproduction in the country. In terms of conservation of biodiversity, its effectiveness can be estimated by expanding the range of specific species (Bezoar goat, Armenian mouflon, Caucasian porridge, etc.) and the number of records related to increasing the number. For example, the number of Bezoar goat (100-1500 individuals), the number of Armenian moufflon (250-300 individuals) has almost doubled since 2010 thanks to the new SPOs (Zangezur, Khustup, Sanctuary, Arevik and Lake Arpi). sacks) and the territorial integrity of the included animal species.

Within the framework of a number of contracts (contracts concluded with Zoology and Hydroecology of the NAS RA and agreements with the US St. Louis and Detroit zoos), a study of aquatic ecology study and assessment of the state of habitats is carried out.

FUNGI

According to the fifth national biodiversity report, the Red Book of Plants includes 40 species of fungi, which were not included in previous publications. Five of these fungi are included in the European Red List of Fungi. In addition, the map of endangered fungi species in Europe has 10 types of fungi found in Armenia. Studies on the current state of fungi show that, within the scope of the "Macaroscopic Mushrooms of Shikahogh State Reserve" of the Republic of Armenia (2016), a comprehensive targeted study of macromolecule diversity was performed for the first time at "Shikahogh State Reserve".

There are 436 types of macromolecules, of which 151 are edible, 51 are toxic, and 99 have pharmacological properties. For the first time, 417 species of macrons have been discovered in the Shikahogh State Reserve, 12 of which are mentioned for the first time in Armenia. Data on macrocosmic mushroom regimens of the Shikahogh State Reserve can be used to update protected areas management plans, practical use of mushrooms in various fields of economy, as well as for educational purposes.

FLORA

Trends in flora species composition and number change in 2014-2018 during (positive and negative)

Literary analysis, field surveys and numerous samples collection have been carried out within the framework of the implemented research. So:

1. At present, licorice biotas of Armenia are represented by 617 taxoons, 230 of which are epiphtheria licenses (Gasparyan & Sipman 2016). More than 150 locations worldwide were studied, based on the results of which the status of some epifitic lubricants was assessed. It was implemented in accordance with IUCN Red List and Red Book criteria. As a result, 7 species were evaluated as critical (CR), 5 types, endangered (EN), 2 type Vulnerable (VU) and 4 species with data disability (DD) status. According to the results of this research, the types of 18 epifitic lyophiles proposed are included in the upcoming edition of the Red Data Book of Armenia. This will help to promote the protection of epiphtheria licenses, especially in forest ecosystems.

2. 132 species of phytoplankton have been recorded in Lake Sevan, of which 31 species of algae are permanent components of phytoplankton. Of the 14 species are diatomic algae, 8, green, 7, claustrophobic and 2, euglene.
3. 2014-2018 a tendency to expand the macrophyte zone is observed. Macrophytes in Lake Sevan are represented by 32 species, 27 tribes and 21 families. Strong macrophytes have been recorded in steep slopes in the wind-protected areas.
4. With high density plants, Armenia is ranked among the highest in the world, with about 107 species per 1000 km2 falling.
5. Only in the last 10 years has been described a new species of science and more than 50 plants for Armenia. There are 3260 plant species in eleven volumes published in the Flora of Armenia series. In the 11th volume of "Flora of Armenia" included a list containing 452 species and 16 subspecies (33 families, 4 families) for Armenia, which are not included in the previous volumes, as a result of which Armenia's flora is represented by around 3800 species of vicious plants - from 160 families and 913 tribes.

The following new types have been registered for Armenia since 2014:

a. Euphorbia daghestanica Geltman (Euphorbiaceae), formerly known as the Russian territory, is described as a new species for Armenia in 2016.
b. Fritillaria hajastanica, previously described as F. pinardii Boiss. Subtype: Now with F. pinardii and subsp. The new species of Fritillaria hajastanica (Gabrielian) Gabrielian comb has been introduced as a result of systematic study of the old and new collections of hajastanica, the nature observations and distinctive features. et stat. nov :
c. Four new species of Alchemilla L., Alchemilla debilis Juz., A. caucasica Buser, A. dura Juz., A. epidasys Rothm. and A. tredecimloba Buser: According to the new data, the Alchemilla L. species is represented in 23 species in the country, instead of 19 previously registered species.
d. For the first time Armenia has been registered with Cephalaria Schrad. ex Roem. & Schult. race C. sparsipilosa Matthews and C.microcephala Boiss. types, and another three types C. procera Fisch. & Avé-Lall., C. kotschyi Boiss. & Hohen., C.

tchihatchewii Boiss. excluded from Armenia's flora. The result was confirmed by the Cephalaria Schrad. Ex Roem. & Schult. The tribe is represented in 9 species in Armenia.

e. As a new breed in Armenia was found a foreign-born Grindelia squarrosa (Pursh) Dunal type:

f. E. Gabrielyan discovered new species of Lactuca L. species for Armenia (according to preliminary data), Lactuca saligna L. type from Syunik and Tavush provinces, Kotayk province, Lactuca aculeta Boiss. and in Vayots Dzor Marz Lactuca sibirica (L.) Benth. Ex Maxim. Type:

g. Two new rare species of Grossheimia ahverdovii (Gabrielian) Gabrielian have been discovered in Geghama Mountains, which has not been found since 1968. It is for the first time brought to Sevan floristic region.

h. For the first time in the Meghri floristic region, Spinacia tetrandra Stev. (Chenopodiaceae), which was previously known only for Yerevan and Darelegis floristic regions.

i. A new habitats have been discovered in Armenia for rare, adiantum capillus-veneris, registered in the Red Book, in the Aparan floristic region of Arai.

Summarizing the above information indicates that in 2014-2018, about the positive trends in flora species variation and flora in Armenia, 19 new and 39 new species for Armenia have been described and published.

The spread of plant invasive and expansive species in Armenia is gradually becoming one of the primary issues of biodiversity conservation. A more detailed description of this problem exists in the fourth issue of Chapter 3 of the National Report.