MINISTRY OF NATURE PROTECTION

ASSESSMENT OF PRIORITY CAPACITY BUILDING NEEDS FOR BIODIVERSITY

Report

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NATIONAL REPORT

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CHAPTER I

IN –SITU AND EX-SITU CONSERVATION OF BIODIVERSITY IN ARMENIA

INTRODUCTION

CURRENT STATUS

According to principles of legislation on nature protection the biodiversity in-situ conservation is implemented all over the country and mainly in the specially protected areas. In-situ conservation in the span includes establishing the special regimes for conservation and use, and out of the territory of span establishing the limits for use.

Biodiversity in-situ conservation and sustainable use has a long history in Armenia. This can be seen in the traditional economical activities practices in Armenia. At the same time, special conservation and use regimes have been established for specially protected areas. Research by Armenian historians indicates that since the middle ages, or even as early as the 4th century, the Armenian King Khosrov established a manmade forest on the territory of present Khosrov reserve. At this forest, different animals were cultivated and used as royal game animals. Different plant species ere considered as relict ones.

The objectives of current report are as follows:

- To assess capacity needs in the area of biodiversity in-situ conservation and sustainable use
- To identify priorities for improving biodiversity in-situ conservation and sustainable use
- To develop recommendations on capacity building and improving in-situ conservation

1.The legal framework for biodiversity in-situ conservation and sustainable use

Armenian legislation on biodiversity in-situ conservation and sustainable use accordingly regulates the public relations during implementation of activities within the field.
The current legal framework for biodiversity in-situ conservation and sustainable use includes:

- RA Constitution (1995)

Establishes the constitutional principles , the main human and civil rights. According to article 10 the state environmental conservation and reproduction, sustainable use.

- Law on Principles of Environmental Protection (1991)

Establishes environmental policy of RA and addressed to ensure conservation of environment and regulation of use. As well as to create necessary legal basic to develop environmental legislation on regulating relationship of soil, water, atmosphere air, flora and fauna forest conservation and sustainable use.

- Law on Specially Protected Areas (1991)

Regulates establishing, conservation and use on SPAN and regulates the relationship in theist area. According to the law SPAs include state reserves, protected areas, national parks and natural monuments. Different articles ensure the regimes for conservation and use of SPAN.

- Law on Flora (1999)

Establishes state policy of RA upon scientific conservation, protection and reproduction of flora. The aim is to regulate public relations in the area of flora conservation and use.

- Law on Fauna (1999)

Establishes state policy of RA upon scientific conservation, protection and reproduction of fauna. The aim is to regulate public relations in the area of fauna conservation and use.

- "On nature protection and nature use fees" (1998)

Establishes the fees for nature protection and nature use, the payees framework, calculating and payment terms, responsibilities, other relations on fees.

- The Forest Code (1994)

Regulates relations in the area of conservation, protection and reproduction of forests.

- The Land Code (1991)

Establishes state regulation of land relations, enhancing efficiency of land use, protection and improvement of suitable environment, land rights protection, etc.

- The Water Code (1992)

Regulates water relations, addressed to effective water use, protection, preventing the negative impact, improving the state of water areas. The law regulates also the issues of conservation and sustainable use of water biodiversity.

- The Entrails Code 1992

Regulates relations on entrails use, entrails conservation, environmental protection while entrails use. Establishes responsibility for mines and related ecosystems conservation.

- Law on Protection of the Atmosphere and Air Quality (1994)

Ensures the air quality improvement, reducing and preventing the negative impact of chemical, physical, biological pollutants.

- Law on Environmental Impact Assessment (1995)
- RA Law "On Sevan Lake , /2001/

Regulates relations on the Sevan lake, issues on conservation replication sustainable development and use of its basin and ecosystems within its economic zone.

- RA Law On adoption of Comprehensive and Annual Measures for Rehabilitation, conservation, replication and use of Sevan Lake ecosystem(2002)

Regulates annual and comprehensive projects on Sevan lake ecosystems rehabilitation, conservation and replication, information on Sevan lake and its basin water resources, flora and fauna, as well establishes norms for water and bioresources use.

- RA Civil Code 1998

Establishes the property rights, civil relations of natural resources use and environmental protection.

- RA "Administrative Transgressions Code"

Establishes administrative liabilities upon the administrative transgressions in the field of biodiversity conservation and use.

- RA Criminal Code1961

Establishes the criminal liabilities of juridical persons and citizens on transgressions in the field of biodiversity conservation and use.

- RA Law on "Plants conservation and plants quarantine, 2000

Establishes the legal, economical and management issues on plants quarantine, regulates interrelations between state bodies and juridical and physical persons in the field of the plants conservation and plants quarantine

- RA Law on public eco-education ;

Regulates the principles of state policy in the field of ecoeducation, legal, management and financial issues.

The above mentioned laws mostly need to be reviewed on the matter of crosscutting issues. Particularly inconvenient are between the Forest Code, Law on Flora, the Land Code and the Law on Specially Protected Areas". The main contradictions are on the issues of land classification, establishing their statuses and regimes for conservation and use. For example, the Land Code classified as specially protected land the parks and botany gardens(article 20), while the RA Law on "Specially Protected Areas" do not mention them.

The legislation covering bioresources also contain inconveniences. Thus, the Law on flora considers plants use as a licensed activity, while the Forest Code considers it as a responsibility of separate forestry's.

The following laws need to be further studied: Republic of Armenia Law on Specially Protected Areas (1991); Law on Fees for Nature Protection and Use of Natural Resources (1998); Law "On Sevan Lake (/2001), and the Republic of Armenia Civil Code

In order to implement the laws, the government prepares by-laws. This includes Republic of Armenia decisions, regulations and instructions). Also, the Ministry of Nature Protection issues permits for use (collection, assembling, hunting, fishing, export, import) and other regulatory documents. Samples are included into the list below.

By-Laws

- On approving the regulations for "Dilijan" state non trade organization and "Dilijan" National Park /Decision of RA Government No 920-Ü , may 11, 2002 /,
- On reorganization of "Sevan" National Park into the "Sevan" National Park state non-trade organization and on approval of "Sevan" National park regulation /RA government decision, No 927- Ü, May 30, 2002/,
- On reorganization of "Shikahogh" state reserve into the "Shikahogh" state reserve" state non-trade organization and on approval of "Shikahogh" state reserve regulation /RA government decision, No 926-Ü, May 30, 2002/,
- On reorganization of "Khosrov " state reserve into the "Khosrov state reserve" state non-trade organization and on approval of "Shikahogh" state reserve regulation /RA government decision, No 925- Ü, May 30, 2002/,
- On reorganization of "Reserve-park complex" state organization into the "Reserve-park complex" state non-trade organization and on approval of "Shikahogh" state reserve regulation /RA government decision, No 1046- Ü, 18.07. 2002/,
- Sevan National Park regulation (RA decision No 23, 26.01.1996),

- Regulation on industrial fishing in Sevan lake RA Government decision No 23, on 26.01.1996,
- On the additions and changes in the RA Government decision No 23, on 26.01.1996, RA Government decision No 170, on 10.03.98
- Regulation on hunting in the territory of RA, Ministers Board Decision No 26, on 21.01.81
- Government decree on Fishing activities in Lake Sevan (1996)
- Regulation on hunting and maintaining hunters communities
- "On considering some water objects as fishing basins"/RA government decision, No 687, 19.12.91 /,
- "On nature use taxes"/ RA government decision, No 864 30.12.98 /

The insufficiency of the legal framework of the area of biodiversity conservation and sustainable use can be explained by the fact, that in 2001 many of the By-Laws regulating biodiversity in-situ conservation and use were cancelled and not yet been replaced by new ones. As a result, in - situ conservation outside the protected areas is currently unregulated.

2. Management system

At the national level, the most important actor is the Ministry of Nature Protection. The MNP has overall responsibility for the management of biodiversity conservation and sustainable use. Some of the related responsibilities include:

- Development of state policy and strategy in the field of biodiversity, establishing principles and approaches to strategies;
- Initiating development of important legal documents (laws, orders, instructions) for conservation, use and rehabilitation of biodiversity, including state forestry resources and specially protected areas;
- Implementing monitoring of flora and fauna, species, habitats, migration routes;
- Issuing permits for the use, import and export of wild animals and plants;
- Managing biotechnologies and their introduction, ensuring biosafety;
- In-situ and ex-situ conservation of rare, endemic, relic species of flora and fauna;
- Implementing and coordinating activities related to valuable biodiversity and landscapes, and unique, ornamental, scientific and ecological viewpoints. This includes the direct management of many specially protected areas.
- International cooperation in the field of biodiversity, including Armenia's obligations to international conventions and other agreements;

The principle department in MNP is the Biodiversity and Soil Conservation department. Some activities (developing legislative documents and international cooperation) are undertaken by legal and international departments. The biological monitoring is implemented by State Inspection on Nature Protection and its structures.

Within the MNP, management of state forest resources (inventory, c conservation, reproduction and use) is implemented by "Hayantar" and "Forest scientific Center" Closed Joint Stock Companies (CJSC) and their territorial divisions.

Planning of state policy of conservation and use of SPAN and methodological management is implemented by biodiversity and soil department of the MoNP. In the state resaves and national parks as well by their administration, which are reporting to the minister or deputy ministers.

In specially protected areas some management responsibilities belong to the Ministry of Agriculture (6 from the 23 state reserves are under supervision of the Ministry of Agriculture). The structure of the Ministry do not include a special nature protection division to regulate the reserves management and not any biodiversity protection activity is undertaken by the Ministry as those responsibilities are mandate of Ministry of Nature Protection, local governance and self-governance

Management liabilities on the territories outside of prtected areas are shared between MoP and MoA. Liabilities of MoA are limited to establish norms for use of pastures and grasslands, and the stste inspection is implemented by MoP. Overlaps in MoP and MoA. Liabilities are in the activities of esatblishing nature protective norms, biotechniligies management, biosafety, specially protected reserves management activities.

The marz authorities are responsible for managing land and monitoring use outside of the specially protected areas. Another level, community authorities are responsible for community level management. Ministry of Nature Protection implements supervision of nature use and nature protection norms.

Management liabilities on the territories outside of protected areas are given as well to local governance – marzpetarans. They implement monitoring on the nature protection norms and regimes on the state reserve and privatised lands through nature protection division. The activities include: monitoring of the nature protective and nature usr, arrangements on natural resources use, etc.

As of yet, there are no regulations covering state reserve activities. The management structures of the state reserves are divided into two sectors - conservation and research/investigation. Marzpetarans nave no own budget, so they can't undertake real actions to implement biodiversity replication.
Management liabilities on community lands are given to local self-governance bodies, with MoP inspectio upon the nature protective and nature use norms. Local self-governance bodies have liabilities on inspection as well. Besides they are liabled to rent the land under entrails, forest, water and air territories in purposes helding measurements on flora and fauna use and conservation and bioresources use.

Clear separation of liabilities between MoP, local authorities and local self-governance bodies is lacked.

In Annex 1 is given the optimal management structure for biodiversity in-situ conservation and sustainable use.

All agricultural land belongs to private individuals and enterprises, under the regulation of the state. Specially protected areas are state property. Forest land belongs to the state.

The Ministry of Agriculture manages some protected areas. It is also responsible for regulating the use of agricultural lands. 6 from 23 reserves of republic are under supervision of Ministry of Agriculture. Therefore, either a department responsible for reserves management do exist here or any activities on biodiversity conservation implemented by MoA, as the responsibilities are granted to MoNP, and local governance.

Out of the protected areas responsibilities are shared between MoNP and MoA . MoA is responsible for establishing norms and regimes of grasslands and pastures use. Monitoring id implemented by MoNP.

In-Situ Conservation In Specially Protected Areas

A network of specially protected areas (SPAN) has been established in Armenia since 1958.

According to RA Law "On Specially Protected Areas" (1991) the SPAs in republic are classified as state reserves, state conservation ares, national parks and nature monuments. Up to 2001 they were classified in 5 state reserves, ("Dilijan", "Khosrov", "Shikahogh", "Erebuni" and "Sev Lich"), 22 state conservation areas and one national park. ("Sevan" National park). In October 2001 state reserve "Sev Lich" was changed into state conservation areaand in December 2002 Dilijan state reserve was reformed into national park.

"Dilijan" National Park

Established in 1958, located in the north sector of republic, on the slopes of Pambak, Areguni, Miapor, Gugarats mountains.
"Dilijan reserve covers 28,002 ha, including 26,010 ha of forests.
812 plant and 158 animal species are being conservated here.
Reserve manages its activities according to the Articles 8 and 9 of RA legislation "On the Special protected areas of Nature . Any ratified legislation to approve the legal basis of park activities doesn`t exist. Managerial structure shows that the main activities of the park is held in two areas – conservation and scientific research.
The reserve territory is under the anthropogenic pressure. The borders of reserve are pointed just on the paper. In fact the reserve conservation regime is being violated, all the kinds of nature use (pasture, mowing, rest and tourism management, etc.) do exist here. Existence of habitats and industries, including mining, contradicts the objectives and goals of state reserve. To exclude the pointed contradictions and to harmonize nature use activities the Ministry of Nature Protection suggested to change the status of reserve and RA government is proceeding ratification of draft "Granting Dilijan state reserve a status of National Park .
According to legislation especially nature protection and research activities had to be implemented in the reserve. Since 1998 in the reserve research activities are terminated, due to the lack of financing and reducing the scientific workers. The regime of reserve is undertaken by special service group and forestry inspectors.

The network actually covers around 311,000ha, or 10% of the total area of the country. The current SPAN covers approximately 60% of Armenian flora and fauna species, including many endemic, threatened and endangered species, as well as many wild relatives of cultivated plants.

For a country with such a rich landscape and biodiversity, and considering the high level of anthropogenic pressure on the natural ecosystems, the area under protection is extremely insufficient. In addition, most of the protected areas cover forest ecosystems. The steppe,

meadow and meadow-steppe ecosystems, essential for nature protection and socio-economic development in Armenia, including biodiversity conservation, are not adequately covered.

The Law "On the specially protected areas of the Republic of Armenia (1991)" classifies the specially protected areas into the following categories (in order of descending level of protection): State Reserves; State Conservation Areas; National Parks; and Nature Monuments.

National Parks

The national parks are territories(water territories) involving natural systems of special ecological, historical and horicultural value. They may be used in recreation, historical-cultural and scientifis purposes due to suitable combinationn of natural and cultural landscapes.

1. "Sevan" National Park

Activities in Sevan National Park target nature protection (research, conservation, rehabilitation and replication of water and land ecosystems and their components) and recreation (including tourism).

Those activities are implemented in different zones of the park, such as:

- Reservation zones (especially of nature protection significance, according to the reserve regime);
- Recreational zones (natural resources used for recreation purposes, within the conservation regime);
- Economic zones (making an economic use of the natural resources).

The activities are supervised and implemented by park administration, including a board of directors and territorial divisions.

ANALYSIS OF CAPACITIES OF SEVAN NATIONAL PARK

1.1. Management system

The activities are implemented as follows:

- conservation division is responsible for revisions of the Sevan Lake and the coastal parts. This division aims to find out and prevent any infringements of the norms of nature protection and nature use;
- Science department - is under construction. None of the planned issues related to the natural ecosystems of the park are being implemented. At present, the technical resources and qualified specialists are insufficient, and these is no appropriate state financing;
- recreation department - has not been operating recently, though recreation is the main activity of the park;

- economic department - the activities are supervised by a director and deputy director. There is no special department for planning and implementing the activities, technical means are lacking.

All the departments of the park have hardships with regulations and appropriate methodologies to implement the activities.

The park is divided into different districts and each district has his own management sub-unit.

The districts do not fully implement the park activities. The objectives of the districts are limited to protection and inspection of Sevan lake and coastal territory. The districts also undertake implement forestry, forest replanting, forest care, forest reconstruction, etc. Recently, low financing has led to limitations in these activities as well. Monitoring, recreation services for population, as well as eco-education and community awareness have not been undertaken at all. Generally, there is an all around lack of technical equipment, financing and appropriate specialists.

Generally, the management system does not match biodiversity conservation or sustainable use specially protected areas. In May 2002, the management status of park was changed and, according to the law "On state non trade organizations", the Park was given the status of state non trade organizations and the related Park regulations were adopted. This status will enable the Park managers to undertake some revenue-generating services (such as eco-tourism, recreation, scientific studies, information). The revenue generated will be used to finance required management activities.

1.2.Human resources

The analysis of the park personnel schedule (annex 2) illustrates that the number is sufficient, but there is a visible insufficiency of skilled specialists in different areas. The number of technical staff and monitoring staff is also large. The different departments duplicate each others activities. The number of workers in monitoring, research and recreation areas is too low, and there are no skilled specialists here.

1.3. Equipment and maintenance

The amount of equipment is too low. All technical equipment is mostly outdated and insufficient. The last update was done in the early 90-s (see Annex 2). There is no specialized equipment for scientific investigation and conservation, or clothes, etc in the park. Most of the transport equipment is in poor condition and should be replaced. The Park has no computers or electronic communications.

1.4. Financing

Since 1999, the Park is being financed mainly from the state budget. The budget expenditures do not take into account expenses related to park development, including investigations and monitoring (see Annex 4). Low finance has led to very low salaries for the staff, on average about 30 USD. Such low wages inevitably affect the capacity for effective conservation of the park.

2. STATE RESERVES

The State reserves are the most protected sites and are considered to be territories of ecological, scientific and historical importance. No human impact is allowed on the reserves. The main objective of the reserves is conservation the of the environment and essential species, as well as scientific investigations. State Reserves are the equivalent of IUCN Class 1a protected areas. Legally, the State Reserves are considered as persons and are fully financed by state budget.

ANALYZIS OF CAPACITIES OF STATE RESERVES

2.1.Management system

The state reserves are under the direct supervision of the MNP. They are separate structural division under the Ministry, operating with the status of juridical person. Appropriate divisions of the Ministry coordinate the reserves activities.

Prior to 2002 there was no national regulation applying to State Reserves. Since May 2002 their managerial status was changed and according to "Law on State Non-Trade Organizations". The Reserves have the status of 'state non trade organizations', and the Government has adopted the regulations. This status enables the State Reserves to conduct some revenue-generating activities (such as ecotourism, scientific studies and information dissemination/education). The revenues can be used to implementing the activities targeting nature protection.

The management structure indicates that the main activities of State Reserves are in two directions - conservation and scientific study.

Maintenance of the reserves ecological regime is implemented by group of guards and inspectors. The scientific study is undertaken by the reserve's scientists and by museum workers. The scientists also conduct biodiversity monitoring and inventory.
According to existing laws, the reserves are expected to implement nature protection and scientific activities. Previously, each reserve had its own scientific divisions. Recently these divisions have been cancelled, and the staff reduced. This, together with lack of financing, has meant that scientific activities have not been conducted in the reserves. Partially these activities are implemented through the hiring and seconding of specialists from other scientific institutions.

2.2.Human resources

The current staff of State Reserves is generally not professional or appropriately skilled. The Reserves do not have adequate skilled scientific staff, particularly in fields such as monitoring, inventory and ecosystems research. They also lack specialized rangers and managers.

The current number of guards was formulated based on the staff norms from the soviet period. The plan was to have four shifts per day. However, with the current number of workers, under these norms, it is only possible to have guards for 1,5 shifts. Hence 24 hour protection is not

offered. Hence, the operational number of staff in the reserves (conducting conservation and inspection) is less than 40% of the required amount.

At the same time, given the current hard socio-economic situation, the threats to the reserves from human activities are growing .

2.3. Technical supply and financing

The equipment in the reserves was purchased between 1960 and 1991 (see Annex 2) and is currently out of service.

Particularly, the administrative buildings are in a very poor technical condition. Recently, due to limits on the state budget, no allocations on capital assets and renovation have been made (i.e. zero financing during the past 5 years). In most administrative buildings, not only capital renovation but basic maintenance has not been undertaken for 10-15 years.

The technical equipment necessary for conservation activities, transport for ranger services, radio communications, weapons and clothes are lacking. There are no computers, electronic communications, scientific and museum equipment, working rooms.
Due to financial and equipment shortages, the maintenance of roads is not undertaken and most of the territory became inaccessible.

Due to low financing, fire protection activities necessary in dry forest systems have stopped.

To summarise, insufficient planning, as well as low salaries, have resulted in the non effective implementation of reserve activities.

3. STATE CONSERVATION AREAS

"Sevlich" state conservation area

Established in 1987, located in the south of Armenia, in Sunikh platou on the top of Mets Ishkhanasar mountain, on the altitude of 2680 m. The mirror of Sevlich lake covers 240 ha. The purpose of "Sevlich reserve establishment was to prevent the high mountainous lake and surrounding subalpine flora from the area of exploring and agrocultural pollution. In the purpose of state reserve activities implementing a board of directors was established, located in Goris, with a staff of 9 emplyers. The reserve wasn`t supplied with important technical and financial means and professional staff. Since 1997 the reserve have been involved into the reserve-park complex of Ministry of Nature Protection. In this terms the maintenance rejime for state reserve and general activities were not been approved. In spite of this, taking into account the positive preconditions of Sevan lake water biodiversity for valuable fish reproduction, mainly Sevan Ishchan, the Ministry of Nature Protection has undertaken to change the status of reserve into the State conservation areas. In October 12, 2001 on decision N 976 of Government of RA the status of "Sevlich" state reserve has been changed into state conservation area, involved under supervision of Ministry of Nature Protection.

State Conservation Areas are specially protected areas where economical uses are not totally excluded, or are excluded temporarily. The regimes are specially designed to enable natural

systems or their elements to be conserved and replicated. The goals of state conservation areas are both conservation of rare, threatened, and valuable ecosystems and species, and the rehabilitation of actively used ecosystems. The Articles 12 and 13 of Republic of Armenia Law "On Specially protected areas" regulate state conservation areas.

State conservation areas were first established in 1950, when a formal process to define the areas was undertaken. At present, the borders are not fully clear. Likewise, the allowed activities are not clear. There is a lack of clear legislation and management systems. Since 1995, following a Government decision, Conservation Areas are all under the supervision of Ministry of Nature Protection, except of 7 which are still supervised by the Ministry of Agriculture.

In fact, State Conservation Areas only exist on paper - with the exceptions of Vordan Karmir and Sevlich. There are no monitoring nor special scientific investigations in conservation areas or their ecosystems. There are no projects targeting conservation and sustainable use. The management regimes to ensure conservation and use of these protected areas have not been established. In fact, the ecosystems inside these areas are managed the same as other ecosystems across the country.

IN-SITU CONSERVATION OUTSIDE OF THE SPECIALLY PROTECTED AREAS

Currently the in-situ biodiversity conservation outside of the protected areas is implemented on the territory of forests, water basins, agricultural habitats and the surrounding green zone. It is regulated by existing government legislation and forthcoming sub-legislative documents.

State forest territories

The state owns 447,2 thousand ha for forestry purposes. This includes 321.1 thousand ha that is currently covered with forests. Management of these forest lands is the responsibility of two Closed Joint Stock Companies (CJSC) – Hayantar and the Forest scientific center (FSC). Hayantar and FSC are under the supervision of the Ministry of Nature Protection, according to principles and legislation of forest regulation/1994/ of RA. Accordingly Hayantar and FSC are responsible for conservation and sustainable use of biodiversity in forest areas.

1.1. Hyantar

Hayantar *CJSC* implements activities on conservation and sustainable use, as follows:

a/ on state order

- elaborating annual and perspective plans for forestry;
- forest conversation and replication (forestation, seed-breeding, care, etc);
- promotion of forest resources and inventories (including genetic funds;
    - fire protection measures;
    - elaborating drafts on forest-cutting and forest managament (separate for each forestry);
    - forest-cutting volumes and scheduling (separete for each forestry),
    - forest-cutting and purveyance monitoring
    - post forest-cutting issues on units and adopting
    - promoting the spring and autumn revision
    - forest amelioration measurments
    - vegatation and animals inventory, conservation within the forestries
    - monitoring
    - research, implementing the leading experience
    - elaborating and implementing international projects, etc

b/ non state measures

- promoting effective use of forest resources, including secondary products;
- improving the targeted use of forest resources and non-wood forest products;
- authorizing implementing activities, excluding forestry and forest use on the forest resources territory;
- elaborating and implementing International projects, etc.

Hence, the MNP is the liable person for managing forestry resources, via Hayantar and its regional branches .

THE MANAGMENT STRUCTURE FOR ”HAYANTAR” CJSC

Hayantar includes 24 regional branches, which are daughter enterprises and have a legal status. Forestry activities are implemented by the daughter enterprises according to the plans established by Hayantar. The daughter enterprises, via their relevant specialised services, implement: forest conservation, reforestation, care, forest-cutting, forest inventories, forest using, including wood treatment, etc. One of the main activities of the daughter enterprises is to improve implementation of nature protection norms in forests, through recording forest infringements, certifying, confiscating illegally appropriated forest resources, as well as applying different punishments for violences (fees, compensation,administrative and criminal responsibility) .

Based on the preliminary recommendations and reports from the daughter enterprises, the central management develops annual and perspective plans for forestry, as well as annual work plans. These are submitted to the Ministry of Nature Protection to ratify.

The same approach is used to monitor and evaluate forestry activities. The final results are presented as executive reports and annual balance reports of the Ministry of Nature Protection.

ANALYSIS OF HAYANTAR'S CAPACITIES

A brief analysis of the current state of forest management reveals a number of contradictions and obstacles to improving the effective management of forestry, mainly:

- lack of up-to-date state policy and forest management strategy;
- weak and obsolete legislative frameworks addressing forest management;
- the unification of forest use and conservation management into a joint system;
- no clear differentiation of competence and responsibilities, often duplication at national, regional and local levels.
- Weak community participation into the forestry activities;
- Weak public awareness related to forest management.

Human resources

The managerial system lacks specialists, especially in management, forestry surveying, forest rehabilitation and replication (see Annex 2). For the most part, the specialists are ageing, and there are too few young specialists joining the sector. This latter is partly a result of there being no relevant courses in universities, except during the last years, when two courses of specialist have started in the Agricultural academy. Due to reductions in finance, appropriate qualification and training courses do not exist.

For more than one hundred years, the forest management had been planned and managed based on the rich experience and methodologies of Russia. After the collapse of the USSR, the cooperation with Russia on specialist training and experience transfer was terminated. This negatively impacted effective management of the forest sector. The same about training in the foreign countries. Lack of specialists is even more serious in the daughter enterprises, where strictly non-specialists manage specialized forestry areas.

Technical supply

Hayantar is very poorly equipped. The equipment is provided in Annex. It was mainly purchased in 1970 and 1980s, and is now in poor condition. There is lack of modern technical equipment and transport. There is a lack of personnel equipment. including communication, clothing and weapons. Administrative buildings and foresters houses are badly organised. Elementary means to mark forests are lacking, as is fire-protection equipment. The country has no scientific, technical means and equipment for forest survey and forestry, including laboratories.

Financing

Hayantar SCJC is financed from the state budget and partly through its own revenue.

In 2000, it was planned to invest 700 mln drams[1] in the overall works. 628 mln drams were planned for forestry activities, and 72 mln drams were planned for auxiliary household issues.

It had been planned to cover the forestry activities expenses through the state budget account (83.1 mln drams) and self-revenue (544.9 mln drams).

In 2000 "Hayantar" SCJC planned to earn 900 mln drams of income, in fact only 638 mln drams joint income was earned, ie only 70.9%. Expenses amounted to 548 mln drams, or 78.3% of the planned amount.

Moreover, the taxes to be paid into the state budget cover 46% of the revenue generated.

Hence, even if the expenditures from the state budget are allocated totally to the forestry, the sums would not cover the current demands of forestry sector of the country: To fully implement forest recovering, care, replication it would be necessary to increase the expenditure from state budget by ten times. Some 600-700 mln drams are needed simply for forest recovery. The same is needed in the areas of reforestation and forest care.

The country's economic crisis, the transport blockade, economic and collapse of trade links, and lack of important marketing combine to not allow a full exploitation of forest resources and, accordingly, to improve the budget via increasing the own revenue.

1.2. Forest Scientific Centre"(FSC)

established in 1998, has 2 departments.

- forest survey, forest funds inventory and forestry
- elaborating perspective plans

The main activities of the Center are

1. Increasing the effectivness of the forests of the republic, improving the nature conservation and elaborating scientific and applied principles for increasing forest cover;
2. Elaborating ways of effective recovering the damaged forest parts due to the non-coordinated cutting.
3. Implementing activities on forestry and forest resources inventory.
4. Creasting a data base of forest resources.
5. The Center also implements activities on conservation and sustainable use mainly

a/ on state order

- implementing experimental forest activities in the Koghb forestry,
- implementing forest surveys all over the forest resources, on the demand of Ministry of Nature Protection;

b/ non-state order

- implementing effective use of forest recourses, including secondary products;
- renting forest land for activities not linked to forest use and forestry within the forest fund territory;
- implementing forest recovering activities – forestation, forest completeing, care, etc;
- implementing international projects;

[1] US$1 = (approximately) 550 Armenian Dram

Management system

The forest research and development programmes division elaborates modern forestry modern methods and technologies. Those are tested on the territory of Koghb forestry.

The forest surveys and forest resources inventory division develops plans for state forest resources surveys, which are the basic documents planning annual and perspective activities on forest establishments, including rehabilitation, maintenance, sanitary and rehabilitation forest cutting. Forestry activities are implementing according to agreements with state authorized person.

ANALYSIS OF FSC'S CAPACITIES

Human resources

The forest survey division is staffed mainly with young specialists, since this field is considered rather new in Armenia. Formerly, Russia and Georgian specialists implemented forest surveys.

The young generation has qualified in European countries, in the framework of international cooperation.

Currently, there is a need for professionals in forest survey, due to the lack of appropriate specialisation in the country's educational system.

Technical support

The technical equipment of the Centre is not sufficient (see Annex). The Centre generally needs modern technical support for undertaking forest surveys, including computers. Transport and technical supplies for forest conservation is also poor.

Financing

During the year 2000, the FSC planned to expend 20,300.00 drams from the state budget for its forestry activities. Actual finance was approximately 9,000.000 drams. The Center has implemented forestry activities to the amount of 13,341.000 drams.

The organization cannot generate revenue. The incomes do not cover the expenditures. The organisation has no assets of its own.

Outside of State forest areas

The status and management of in-situ conservation and the use of pasturelands and other agricultural lands is covered by the following legislative acts:
"Law on Flora"; "Law on Fauna"; "Land Code" and, "Law on Nature Protection and Payments for Natural Resources Use".

During land privatisation in 1991, most of the pastures were not privatised. They passed to provincial and community supervision. Most of this land is now owned by local governments, but is managed through short-term (1-3 years) and long term (more than 3 years) contractual

rents. However, insufficient norms to cover the use, duration, allowed pressure and the absence of conservation, the pastures and grasslands lying close to community settlements are badly affected. They are mainly administered by local communities, where supervision upon the land use norms is lacked. Pastures are mainly overgrazed, and the grasslands – degraded.

The negative impact of renting, as well as the absence of state incentives for rehabilitation, is important matters.

Water areas

The biodiversity conservation and use in different water bodies is covered under RA Laws "On fauna , "On Flora" "Testing the affect on environment", "Athposphere protection" and legislations on Water, Land Soil and a number of sub-legislative documents.

Up today, the water biodiversity conservation and use are not regulated and by-laws are not implemented. The single exception is the legal basis for Sevan lake and its ecosystem conservation. The articles on Sevan lake biodiversity conservation are encrypted in RA Laws "On Lake Sevan " (2001) and "On adopting annual and comprehensive programs on Lake Sevan ecosystem rehabilitation, conservation, replication and use" (2002). Conservation and use of Lake Sevan and its basin biodiversity play a particular role in these acts. The liabilities and obligations of state and local authorities are clearly identified. The projects implementation will facilitate mitigation of the man-made negative impacts, improve water quality and initiate development of the recreational industry. However, it should be noted, given the current financial condition of the republic, it is not possible to fully implement the projects.

Out of specially protected areas, local nature protection divisions undertake the management liabilities also. These divisions implement monitoring of nature protection and nature use, they record infringements of nature protection regulations, they sign contracts with nature resources uses, etc, according to RA legislation. In community territories, local authorities undertake these functions also.

Out of the protected areas, responsibilities are also given to the Ministry of Agriculture. The Ministry is responsible for establishing norms for pastures and grazing lands use.

The differences of responsibilities between the Ministry of Nature protection, local authorities and local self-governance are clearly defined on community territories.

To enhance efficiency of state management upon biodiversity conservation and sustainable use we need to clearly determine the responsibilities amongst the stakeholders. Planning the state policy on biodiversity conservation, biodiversity conservation on the state lands, norms for use, as well as accordance to the legislative requirements is to be supervised by a single institution – the Ministry of Nature Protection.

NON-GOVERNMENTAL ORGANISATIONS

Non-governmental organisations of Armenia currently undertake activities related to raising the ecological awareness of the population, preparing publications, as well as biodiversity conservation and replication.

Key environmental NGOs in Armenia are represented in Annex 5.

The number of NGOs may be more than listed in Annex. However, we have to point out that even the listed NGOs do not participate actively in the process. The activities are limited due to the lack of financing. The NGOs do have a strong specialized staff, unfortunately without any experience of environmental project implementing.

NGOs do not fully cooperate with the Ministry of Nature Protection in the implementation and coordinating the activities in the field. Hence there is a problem of information gaps and overlaps of activities. Activities do not match modern environmental priorities.

Operational tools are to be developed to consolidate NGOs, resource mobilization and coordination of activities.

PROJECTS ON BIODIVERSITY IN-SITU CONSERVTION AND SUSTAINABLE USE

Local Projects

The government implements most local projects on biodiversity in-situ conservation and sustainable use in Armenia. Since 1996, industrial fishery was undertaken on Sevan lake, based on the permits and agreements granted by the Ministry of Nature Protection to the economical subjects. The duration of game weapon, Ministry of Nature Protection estimates game animals, and hunting tools, according to the conclusion of NAS Institute of Hydroecology and Fishery. Within the framework of the "Completing the fish resources" project, the government has undertaken reproduction of valuable and endemic species of Sevan lake.

During 2001, in the framework of the project, Sevan and Lichkh fish breedings conducted totally 169,400 units of Salmo ischan.

In Soviet period, government implemented activities outside of protected areas. Notably, the Armenian moufflon reproduction started in the 1970-80s. Today the works are terminated due to the lack of financing. The Government also implemented an initial collection of wild plants.

Now, in the market economy, reproduction of valuable fish and industrial fishery is implemented in different private lakes, according to permission granted by Ministry of Nature Protection.

International projects

Project	Under Financing	Implementing date
A review of Forest Sector Development,	FAO	1996-97
The Lake Sevan ecological balance recovering Action Plan, funded by the World Bank.	World Bank	1996-97
The National Environmental Action Plan	World Bank	1996-97
Wetland inventory	Small grants Fund of RAMSAR convention	1998-1999
Developing a full size project on agrobiodiversity in-situ conservation and sustainable use	GEF	1998
Strengthening the management structure of Ministry of Nature Protection	UNDP	1997-98
" A Forest Resources Assessment",	SIDA	1998
Preparing the First National report on biodiversity of Armenia and Biodiversity Strategy and Action plan of Armenia	GEF	1997-2000
" Second National report on biodiversity of Armenia (in the framework of "Assessment of priority capacity building needs for biodiversity and Clearing House Mechanism creating" project	GEF	2001
National plan to combat desertification in Armenia	UNEP	2000-2001
Rehabilitation of Lake Gilly	GEF	2000-2001
"RA Natural resources management and poverty reducing" Project	World Bank, GEF	2001-ongoing
"Forest Genetic resources conservation and rational use in Transcaucasus	Under /IPGRI/	2001
"Developing the principles of Armenian forests certification	in the frames of implementing the small ecological projects supported by "Proforest" English	2001

	organization	

EDUCATION AND TRAINING

The biodiversity in-situ conservation and sustainable use issues are a subject for Yerevan State University, Academy of Agriculture, Yerevan state institute of economy, Yerevan Pedagogical Institute, and other private universities.

The current educational system is eligible to provide appropriate specialists. Though the process is far to be satisfactory. As a result the employers of the area are not specialized in the field. The lack of qualified specialists can be explained as follows:

- Lack of education and training for specialists in the filled of in-situ conservation
- Low salaries and lack of social insurance for young specialists.
- Lack of technical capacities for research

RECOMMENDATIONS

To improve efficient management of biodiversity conservation and sustainable use we have to solve a number of urgent tasks:

- To develop state policy and strategy aproved by government
- To identify biodiversity as a strategical priority for socio-economic development of the country
- To develop national comprehencive program on nature protection and sustainable use (to be aproved by government)
- To develop a program on a network of specially protected areas.

1. Improving the legislative framework

- To ratify the following related conventions:
- Convention on international trade on endangered wild flora and fauna,Washington, 1973.
- Convention on migratory wild animals species conservation and related European agreements, Bonn, 1979,
- Convention on conservation the wild flora and fauna and their environment, Bern, 1979.
- Harmonisation of local legislation to the international demands

1.1. Ammendments in the existing Laws

- RA Law "On Specially protected areas"
- RA Law "On Sevan lake"
- RA Forest Code
- RA Civil Code

1.1.1. developing and adopting the following laws:

- "On landscapes and biota's conservation ,
- "On migratory species conservation ,
- "On reducing taxes for environmental organizations ,
- "On changes and additions in the RA Law on specially protected areas,
- " On changes and additions in the RA Law on Sevan Lake ,
- " On changes and additions in the RA forest codes,
- " On changes and additions in the RA Law on the environmental and nature use taxes ,
- " On changes the RA Civil Code ,
- " On changes in the RA Governmental decision on Law environmental and nature use taxes rate.

1.1.2. developing and adopting the following sub-legislative documents, improving applying the laws

RA Government decisions

- On establishing regulations on specially protected areas, including state reserves, state conservation areas, national parks, nature monuments, natural parks, dendroparks, zoological and botany gardens, flora and fauna collections, etc.
- On identification of specially protected areas network, borders, establishing regulations , development projects and cadastre
- on adopting the regulation on hunting on the RA territory, ,
- on adopting the regulation on wild natural recourses use,
- on adopting the regulation on wild animal recourses use,
- on adopting the regulation on import-export of wild flora and fauna species
- on adopting the regulation on industrial and amateur fishing,
- on creating and developing the wild flora and fauna cadastre,
- on adopting the regulation on Red Book management,

Local regulations

Decrees on the staff of specially protected areas,

2. Improvement of the management system

- Clarification of the management liabilities in the field
- Clarification of liabilities of territorial management and local self-governance bodies.
- Clarification of liabilities of the different divisions within the MoP
- Improving the system of nature protection monitoring through clear identification of liabilities, responsibilities and activities of state, territorial, institutional structures, creating sustainable cooperation mechanisms between those structures.

The Ministry of Nature Protection of Armenia undertakes management of biodiversity in-situ conservation, sustainable use and monitoring. Actually, the decisions are made by the same management structure that is responsible for nature use.

The key conservation activities of the Ministry are implemented via its central apparatus - the division on flora fauna conservation and specially protected areas and the state inspection for nature protection. The liabilities of the mentioned structure do not allow to fully implement management and monitoring.
The liabilities of local management are limited.

3. Improving the specially protected areas network

The current network of specially protected areas of the Republic is developed spontaneously and does not match international standards.

4. Measures requested

Assessment of existing specially protected areas and approximation of their status to international standards(see Annex 3);

5. Improving the financial mechanisms

The state organizations implementing biodiversity in-situ conservation and use are financed in general through the state budget, and the amounts do not match the needs for implementing the required activities. Actually, even the planned amounts are often are not allocated. In the current social-economical situation, no improvement of the financial situation foreseen.

- To create additional sustainable sources for financing
- to create special accounts for state organizations implementing in-situ conservation and sustainable use , to generate income from economical, recreation (including tourism), publications, taxes for nature use, grants, and fees
- to establish "Biodiversity Fund", where the generated revenue will be directed to biodiversity in-situ conservation and reproduction
- to revise the fees for forest wood and matching them to international standards.

Except of this international financing and donor organizations, in the framework of appropriate projects, including; could provide a solid support ;

After the project life the 50-70% of equipment purchased by the project passed to appropriate units of in-situ conservation,

The income generated during project life should be directed to purchasing the equipment for in-situ conservation units.
The proposed financial resources to implement required measurements are given in Table 1 (see Annex 2).

6. Staff strengthening

- Incorporating specialist training on "In-situ conservation and sustainable use" into the educational system of republic;
- implementing staff training and experience exchange;
- creating a legal basis for implementing appropriate staff policy;
- salaries increasing.

EX-SITU CONSERVATION AND SUSTAINABLE USE

Today, an idea has been formulated that biodiversity is the essential element for human life and the key component for sustainable human development. Biodiversity conservation is implemented in-situ in the specially protected areas and out of them and ex-situ – in the botanical and zoological gardens, dendroparks and other green zones.

1. EX-SITU CONSERVATION OF ANIMALS

1.1.Live collections

Private Zoos and small collections keep by the Yerevan Zoo as well as live collections in Armenia. In addition, special museum collections do exist in the country, such as at the "Dilijan" and "Khosrov" state reserves, as well as at the "Sevan" National Park. These are in a very poor condition due to lack of finances.

Some private collections – terrariums and aquariums - currently implement conservation and reproduction of exotic species. This provides some experience in the area of animal maintenance and reproduction. A number of organizations (Zoos) implement activities related to animal reproduction, which may serve the projects, both providing for ex-situ reintroduction and for economic production (game animals, fishery, etc.). Priority is given to vertebrates included in the International and Armenia Red Books.

A number of fisheries exist which breed economically valuable fish. Of these, the most important are the 3 fishery plants at Lake Sevan (Gos, Sevan and Kharchagbyur). The main task of these fisheries is the reintroduction of summer salmo ischan, coregonus, and varicorhinus capoeta.

Within the Institute of Botany, on the 3,000m^2 of the Armenian Center of Flora and Fauna conservation which was established in 1993, rare and threatened plant and animal species, specific for natural ecotypes, are assembled and completely exhibited. Some works are undertaken upon 8 species of reptiles, with the specific aim of investigating the conservation and reproduction methods.

One of the most exotic ways for ex-situ conservation of wild animals is crio-conservation of genome.

Yerevan Zoology Institute covers 8.5 ha, and the facilities for animals maintenance cover 5.2 ha, that is 61.2% of total area. It is the only State Zoo of Armenia. 173 species of birds and animals are recorded (data on January 1, 2000), which is 16.4 % less than the previous year. Otherwise, the number of birds and animals has decreased and comes to 2,337 compared with 2,150 the previous year.

Essential information on biodiversity and genetic resources are kept with the Institutes of Botany and Zoology, Hydroecology and Fishery, Yerevan State University, Agricultural Academy and State Nature Museum collections.

Moscow Zoo established the Euro-Asian Zoos and Aquariums Association with the purpose of consulting and methodologically supporting CIS countries. It publishes "Information bulletin on zoological collections".

Recently, due to the hard economical situation in the area of biodiversity conservation, the number of organizations involved in improving ex-situ conservation of animals has reduced.

1.2. Legal framework

The Law "On Fauna of Armenia" covers ex-situ conservation of animals. Other laws and regulatory documents do not exist.

Despite the existing base, the works in the Zoology Institute had been terminated, due to lack of funds.

Organizations functioning in the area of ex-situ conservation operate independently. There is no central coordinating center.

THE MAIN CONSTRAINTS FOR ANIMALS EX-SITU CONSERVATION

- Lack of animal breedings
- Lack of technologies for mass reproduction, aimed to encourage animal species reintroduction

The existing collections cannot provide appropriate maintenance, due to lack of finance. The private collections are amateur and are not regulated by government. They are not essential for animal conservation purposes.

The volume of works in fishing enterprises declined recently, due to financial shortages.
There is no comprehensive scientific-methodological Center in the area for animal ex-situ conservation. Such an organization could compile and summarize information on animals groups and conservation organizations.

RECOMMENDATIONS

Measures to be undertaken for ex-situ conservation of animals:

- To develop and publish methodological guidelines for the ex-situ conservation and breeding of rare and valuable animals;
- To create a comprehensive scientific-methodological analytic center aiming to coordinate activities and complete information on animals groups and organizations conserving and breeding them, as well as to hold training courses;
- To develop skills and specializations in the young generation. Develop and establish special courses on animals ex-situ conservation.
- To analyze the needs in terms of reintroduction Armenia, listing the representatives of Armenian ex-situ.

- To develop guidelines addressing the safe introduction of animals.

EX-SITU CONSERVATION AND SUSTAINABLE DEVELOPMENT OF PLANTS

Ex-situ conservation of plants aims to:

- Improve the flora of the republic by introducing alien species (economically valuable, medicinal and others);
- Ensure conservation, reproduction and sustainable use of the indigenous species, first of all the rare and threatened, endemic and relic species;
- Improve public awareness.

Ex-situ conservation of plants facilitates the introduction of ecologically flexible and decorative, economically valuable plants into the greening and forestry activities. It also helps to establish an especially significant dendropark in botany gardens, which will provide a unique recreational area. Given this, botany gardens and dendroparks clearly enhance the overall approach to biodiversity conservation in the country.

In-depth and multilateral studies of biodiversity under ex-situ conditions results in an improved understanding of individual species, and can lead to more efficient use in different fields, as follows:

- To determine the most decorative characteristics of plants and apply them to greening and recreational purposes;
- Applying medicinal plants in pharmacology;
- Suggesting ecologically flexible and economically valuable species for ameliorating forest and anti-erosion nurseries;

A number of studied and tested ex-situ plants are also used as a basic material, as well as in selection activities to ensure new effective grades.

- Organizations implementing ex-situ conservation (botany gardens and dendroparks) also undertake public awareness raising, as follows:
- Conducting individual visits and eco-educational activities in the places;
- Conducting educational and productive activities with the students;
- Comprehensive information by mass-media

Ideally biodiversity ex-situ conservation system should include the following points:

- Botany and zoological gardens as institutions of more universal educational and recreational significance;
- Dendroparks, where mostly trees and bushes are grown and exhibited. They are first of all decorative-landscape vegetation and of recreational significance;

- According to IUCN classification, the botanical and zoological gardens and dendroparks should have the status of state reserves.

These units cannot have the same governance and administration. Optimally, the network of institutions implementing plants ex-situ conservation have to be under a joint supervision, whereas the scientific activities have to be coordinated by botany gardens (as the leading scientific institution).

This model, provided with a clear improved legal and institutional basis, should serve as a unique system for recreation, natural wealth and storage for biodiversity gene pool conservation.

To create a model it is important:

- To clarify the status of institutions implementing ex-situ conservation, both administrative and those implementing the goals and objectives;
- To implement sustainable strategy and management policy:
- Clear legislation regulating activities in the field of ex-situ conservation;
- Comprehensive modern technical and communications framework basis to ensure effective implementation of activities identified in the field;
- Staff provision, including qualified scientific, technical and support staff:
- Informational network and international cooperation;
- Active cooperation on regional and international levels (investigations, workshops, field trips). This is essential to implement transfer of initial materials aimed at biodiversity conservation.

STATUS OF BIODIVERSITY EX-SITU CONSERVATION[1]

The current report presents some views on state of biodiversity in Armenia, such as staff, technical supply, legal framework, management, etc.

The optimal management of botany gardens and dendroparks is impossible without information exchange and international communications.

Formerly, the institutions implementing biodiversity ex-situ conservation in Armenia had regular communications with more than 400 botany gardens all over the world. Sustainable seed exchange was undertaken annually by Index seninum.

The Botanical gardens and dendroparks actively cooperated at several levels: regional (through the Council for the Botanical Gardens of Transcaucasus); throughout the USSR (Council for Botany Gardens of USSR), and; internationally (International Association of Botany Gardens).

Annual workshops, seminars, conferences took place. Remote field explorations were undertaken to obtain seeds, plants, etc.

Now, the above mentioned communications and cooperation no longer exist. There are no field explorations on the territory of republic.

Capacity strengthening and sustainable use should cover about 500,000 USD annually, including 200-250- in Yerevan Botany Garden and Sevan and Vanadzor branches.

Ex-situ conservation of plants is implemented by Botanical Gardens and dendroparks. They are research, educational, and conservation institutions. The main activities are the importation and adaptation of plants, as well as biodiversity conservation, reproduction and sustainable use.

Formerly, ex-situ conservation and research was coordinated by the Botany Garden of RA NAS (established in 1935), Vanadzor (1936) and Sevan (1944) branches. Since the 1980s, the cooperation failed due to changes in status and institutional supervision of dendroparks. During the last 80 years, Stepanavan "Sochut" ,"Vanadzor", Ijevan "tropical" , Berd "Soraner", Achtalah, Bagratashen, Byurakan observatory, and Jermuk dendroparks were established. At the same time, some green zones and parks were established in a number of large cities and settlements over the country, first of all in Yerevan and then in Gyumri, Vanadzor, Kapan, etc. They include about 50-300 species of trees.

In the Botanical Gardens and dendroparks, also in the different decorative plant breedings, first of all tree-bush plants, with an overall quantity of more than 1,650 species conserved. (See Table 1)
Currently in Botany parks and dendroparks, about 6,000 plant species are considered as the object of ex-situ conservation, including 5,000 in Yerevan Botany Garden, where about 1,200 species of tree-bushes, 2,000 species of open land flowers, and about 1,000 sites of tropical and subtropical plants are being conserved in greenhouses.

[1] see Annex 4

Within the Botanical collections of special importance are representatives of Armenian indigenous flora, represented in a range of about 850 taxonomic species, or the 25% of the overall biodiversity of the country. This collections do exist on the exhibit territories of Armenian Flora, where special attention is paid to the rare and disappearing plant collections, involved in the Red Book of Armenia. Collections practically have no opportunities to be completed. Thus, not all the species within the flora have high ecological adaptation to the demands of Yerevan semi desert zone dry climate.

During the last decade, the "Center for flora and fauna conservation of Armenia" has been created on 3,000 m^2 within the Botanical Gardens. At this center, about 300 species of rare and vanishing plant and animal species have been assembled. This conversation type is very close to the natural situation and encourages the investigation of animal-plant relations more completely. It also ensures that visitors (mainly students of ex-situ conservation of Armenian biodiversity) can study this natural situation.

Enriched scientific herbariums have been established at the Botanical Institute of the National Academy of Sciences (more than 265,000 species) and in the Biology Department of Yerevan State University (about 25,000 species). A rich seed collection has also been established at the Botany Institute. Recently, due to lack of finance and resources, the conservation was terminated and the collection has not been completed.

ANALYSIS OF PLANTS EX-SITU CONSERVATION

As we analyze the condition of biodiversity conservation, we discover that the more efficient. Public awareness and utilization activities for ex-situ conservation are implemented at the Botanical Garden of National Academy of Sciences, with Vanadzor and Sevan branches. Opposite to this, other institutions (mainly dendroparks) in different times in non-scientific spheres and under different departments are unable to implement efficient activities. They focus on the import and sustainable use of valuable plants from the different vegetative geographical regions. Yerevan Botany Garden had supported those institutions and coordinated the efforts in the republic. This coordination resulted in an annotated catalogue of the trees and bushes of Botanical Gardens and dendroparks of the country, published in 1990s, where under the initiative of the Botanical Gardens, the specialist results of ex-situ conservation of plants are summarized.

The Botanical Garden of Armenia, since 1950, was involved in the Board of Transcaucasus Botanical Gardens and at the level of Soviet Union – as a member of USSR Board of Botany Gardens, as well as a member of a number of Botanical organizations and Associations. Due to cooperation at different levels, it gained a wide scientific recognition. Periodically, joint workshops (regional and international) were held, facilitating the creation and completing of collections of plants with different geographical origins, as well as enhancing the skills of specialists.

Last decade, the large migration of potential scientists resulted in the loss of a great number of qualified specialists from scientific-educational institutions, including Institute of Botany and Botany Garden. The average age for operating specialists is now above the pensionable age and physically they are not available for field trips. In addition, due to low salaries, the process of maintaining the new, young specialists has largely stopped. In a few years, this sector may lose the few remaining qualified enthusiasts, given the current impossibility of replacing older experts with younger ones.

1. Technical supply

The next difficulty handicapping the activity of Dendroparks and Botanical Gardens is the low provision of technical equipment or lack of it.

> The Botanical Garden has at least 2 UAZ –K69 transport for field trip purpose, although it does not ensure their maintenance and lacks fuel. In the entire, reserve-park system, where dendroparks are located, no transport exists at all. The main reason for this is that for 20 years they are physically and morally damaged and so cannot be used anymore. So, the institutions implementing ex-situ conservation of plants have an urgent need for equipment.

The Botanical Garden is an institution cooperating with the Institute of Botany of RA, and existing especially under state financing. For the last 2-3 years, it has lacked the necessary finance to cover the purchase of "miscellaneous" articles, except for salaries. In this aim the situation in other gardens and dendroparks, where the status and supervision is often changed last decade. Here we have joint and approach of government. In the sphere of plants conservation, protection and care and irrigation as well the situation in the gardens is mostly worsened. Due to shortage of funds, the gardens do not operate the security system.

Chemicals, fertilizers, and other substances, important to prevent the plant collections from diseases and pests, are also lacking. After establishing the monetary system of irrigation, the Botany Garden (first of all Yerevan Garden, which is in the dry semi-desert zone) has no regular water supply. In early spring and late autumn it is impossible to transplant and transport relevant seedlings from nurseries to the exhibition area.

A collection of tropical and subtropical plants exists at Yerevan Botanical Garden, with more than 1200 species. This collection serves for visitors, mainly for students, as the high level eco-educational and acknowledgment base. Currently, due to the lack of heating facilities, those collections are deeply damaged, and the 300-400 surviving species are being transferred to the safer and warmer areas for the winter.

With regards to dendroparks, the plant variety being conserved is incomparably low, much lower than in the Yerevan Botany Garden. A richer biodiversity exists in Ijevan (507 species) and Stepanavan "Sochut (456) dendroparks, the number of species varies from 190 (Byurakan dendropark) to 43 (Bagratashen dendropark).

In most dendroparks the collections are created mainly to create a decorative-landscape and taxonomic (Ijevan and Stepanavan) principles: In Vanadzor, Stepanavan and Ijevan dendroparks specific gravity have coniferous trees. In all the dendroparks, the conservation of representatives of indigenous flora, as a rule, is considered less essential, than in Yerevan Botany Garden. The most part of dendroparks collections are imported species.

Analyzing the experts working in the institutions, implementing plants ex-situ conservation, we discover, that, though the current number of employees ranges from 6-35 persons, there are no skilled scientific workers in dendroparks (except at Ijevan).

2. Legal framework

The legal framework to regulate Ex-situ conservation has not been formulated. Laws are regulating the field

- RA Law On Flora, (article 18)

- RA Law On Fauna, (article 20),
- Forest Code

By-laws are lacking as well.

The entire field is represented by a single By-law – Botanical Gardens. This regulates the use of botanical gardens and the conservation network. It generally fails due to the low identification of liabilities of institutions. Import and export have not been regulated yet, even for alien species. As a result, private parks are growing without any regulated by-laws.

3. Management system

There is no coordinated approach to the creation, conservation and maintenance of Ex-situ conservation collections in Botanical Gardens, dendroparks and parks. They are under the supervision of different institutions and have different management. Yerevan Botany Garden, with Sevan and Vanadzor branches, is under supervision of the RA NAS, most dendroparks (Vanadzor, Ijevan, Stepanavan) have been, at different times, supervised by the Ministry of Nature Protection, Hayantar, and others. The other dendroparks are considered the property of the concerned cities and are supervised by city authorities. Under these circumstances, no single coordinated approach can exist.

An analysis of the current status of ex-situ conservation management shows that the management network is insufficient, the methodology for coordinating a unified strategy is absent. The establishment of a joint management mechanism at the managerial and legal levels would lead to improvements. This would involve the Ministry of Nature Protection on issues related to their status as specially protected areas, and the RA NAS Botany Gardens network should be involved for scientific matters.

RECOMMENDATIONS

To implement ex-situ conservation and sustainable use activities, there is an urgent need to improve the legal framework regulating the field.

Laws to be adopted:

- "On RA Botany Gardens and dendroparks", as a unique storage of gene pools and national property, as well as recreational objects.

- "On RA plants and animal collections, herbariums, microbes depositary"

When creating areas for ex-situ conservation, important factors are the climatic conditions, the existence and distance of habitats, the proximity to industrial centers as well as the forest-vegetation and the microclimatic conditions. Most dendroparks are located in wet forest areas and are mainly able to grow mezophil vegetation, which is not very sustainable for biodiversity from the southern arid zones of Armenia. Under these conditions, the adaptation for species imported from arid zones became a hard task.

Given the above-mentioned negative factors, it is necessary to establish so called arid dendroparks with species variety composed from indigenous tree species.

ANNEX 2

PROPOSED FINANCIAL RESOURCES TO IMPLEMENT REQUIRED MEASUREMENTS

	Activity	Possible financial source	Cost USD
1.	*Developing a state concept and strategy and adopting it by government*	*UNEP, GEF* *WWF*	*5000*
2.	*Improving the legal framework*		*41000*
3.	*Ratification of related conventions*	*UNEP, GEF* *Donors, other inter national funds*	*10000*
4.	*Developing new laws*	*International donors*	*6000*
5.	*Amendments in the Laws*		
6.	*Developing and adopting By-laws*	*International donors*	*25000*
7.	*Improving the management system*		*5000*
8.	*Identification of management liabilities*	*In the framework of projects under state budget financing*	
9.	*Developing and implementing the mechanisms for NGO involvement into the management*	*In the framework of projects under state budget financing*	
10.	*Improving the mechanisms for public awareness in all the management levels*	*International donors*	*50000*
11.	*Improving the SPAN network*		*105 mln*
12.	*Assessment, capacity improvement for existing SPAs, as well as proving accordance of their status to international standards*	*UNEP, GEF* *Donors, international funds*	*5 mln*
13.	*Creating new SPAs*	*Donors, international funds*	*100 mln*
14.	*Improving financial mechanisms*		
15.	*Creating sustainable sources of additional funding*	*In the framework of projects under state budget financing*	
16.	*Staff training*	*UNEP, GEF* *Donors, international funds.* *In the framework of projects under state budget financing*	*2 mln*

ANNEX 3

LIST OF EXISTING SPECIALLY PROTECTED AREAS

1. "Sevan national park

Requested status - national park
- developing the general plan
- revision of functioning zones
- rehabilitation of Gilli lake
- developing the forms of nature use
- regulation revision
- improving the equipment (transport, communication, other necessary measures for conservation)
- staff revision, according to park activities
- staff training

2. "Khosrov state reserve

Requested status - state reserve
- developing the general plan
- developing and adopting the regulation
- border identification in the purpose to improve completeness of ecosystems
- developing the conservation zone
- developing preconditions for matching to biosphere reserve status and adopting the status
- improving the equipment
- museum and samples rehabilitation and completion
- staff revision

3. "Shikahogh state reserve

Requested status - natural park
- developing the general plan
- developing and adopting the regulation
- border identification
- developing preconditions for matching to biosphere reserve status and adopting the status;
- improving the equipment (transport, communication, other necessary measures for conservation)
- staff revision

4. "Dilijan national park

Requested status - national park
- developing the general plan
- developing and adopting the regulation
- borders identification and – of functional zones
- museum and samples rehabilitation and completion
- improving the equipment
- staff revision

5. **“Erebuni state reserve**

Requested status - botany state reserve (reservat):

- include into the structure of park-reserve complex
- develop the inventory and establish the conservation regime

CONSERVATION AREAS

- Revise the list of existing conservation areas, matching them to the international standards
- developing the cadastre and establishing the regime for each of them.

NATURE MONUMENTS

- establishing the list of nature monuments.
- inventory and passportization
- establishing liabilities for conservation responsible persons.

CREATING NEW SPECIALLY PROTECTED AREAS

6. **“Arpi National park**

Purpose is conservation and sustainable use of Grav-Gnishik natural system biodiversity, wild plants genetic fond and nature monuments.

7. “**Kirants natural park**

Purpose is conservation of forest ecosystems biodiversity and mainly the relict ones conservation and ecotourism development basing on nature and human heritage.

8. “Vorotan natural park

Involves Vorotan canyon of the Syunik marz, from Spandaryan reservoir to Goris. Purpose is conservation of unique ecosystems of Zangezour, as well as landscape, geomorphologic and historical monuments, and their use in purpose of recreation.

9. “Arevik state reserve

Purpose is to improve conservation of biodiversity, rare and endangered , unique nature monuments, transboundary habitats of endemic and rare animals in Zangezour mountains (Armenia-Iran-Azerbaijan). The State reserve is expected to be established basing on “Bogakar" state reserve.

ANNEX 4

Table 1[1]

Plants biodiversity (EX-SITU) distribution per Botany gardens and dendroparks

Botany gardens /dendroparks	***Number of taxons***						
	Family	***Genera***	***Specie***	***Coniferous***	***Trees***	***Bushes***	***Wood lianas***
Yerevan Botany Garden	61	161	1070	91	396	526	149
Vanadzor Botany Garden	47	140	590	68	249	315	26
Sevan Botany Garden	42	101	440	50	235	208	14
Ijevan tropical dendropark	61	162	507	131	261	213	8
Stepanavan "Sochut dendropark	26	111	456	46	-	-	-
Vanadzor "Vanadzor dendropark	34	84	190	40	107	79	1
Byurakan dendropark	30	60	121	17	81	38	2
Berd dendropark "Soraner	30	73	142	28	69	70	3
Jermuk dendropark	31	66	155	16	78	54	6
Akhtalah dendropark	22	41	51	10	34	10	1
Bagratashen dendropark	21	43	92	31	36	24	2

[1] To compare how large is this figure, we have to point that in Armenia the natural or aborigine dendroflora is represented by about 300 species

Table 2.

Generic and specific distribution of vegetation of the 10 leading families in the Botanical Gardens and dendroparks of Armenia.

Family	***Number of taxons***	
	Genera	***Species, sub-species***
Coniferous		
Cupressassae	7	97
	6	78
Berberidaceae		
Befulaceae		61
Caprifoliaceous	3	30
Fabaceae	4	124
Fagaceae	7	97
Oleaceae	21	40
Rosaceous	4	142
Rhamnaceae	9	393
	30	44

Table 3

Number of species of the 10 most important families/Specific fulfill ness of 10 most large patrimonies

Family	***Species***
Syringe	72
Lonicera	70
Rosa	56
Berberis	51
Spiraca	41
Acer	41
Philadelphus	37
Juniperus	32
Pinus	29
Sorbus	
Total	442

CHAPTER II
MONITORING PROGRAMS
(INCLUDING TAXONOMY)

INTRODUCTION

The modern state of the Earth is a result of a long historical process. The changes are caused not only by physical and chemical processes, but also by activities of living organisms, influencing biodiversity and biological resources. Naturally, the bio-resources are directly connected to biodiversity and provide a basis for sustainable economic development and human society welfare.

Each species, and the surrounding environment – is a unique phenomena. It is a result of a long evolutionary process and it has its own historical life. Throughout the ages, human beings have developed basing on exploitation of these natural resources. Recently, the speed of nature use has increased and has turned into a real threat to many separate species, and to ecosystems in general. The rate of species extinction due to human activities is estimated to be 50-100 times greater that the natural rate of extinction. In average, 5-20% of plants and animals species are currently endangered. Once lost, it is impossible to recover a species or a landscape, though each of them is a unique genetic resource, a basis for further development of nature and carries unique hereditary characteristics, not entirely known, but possibly to be used by human beings.

The human community has realized that the consumption of nature has to be revised. The problem of nature protection and effective use of natural resources is a global problem, only to be resolved by the joint efforts of all countries.

Measures for nature protection can only be efficient if they are based on scientifically sound knowledge. In particular, biodiversity assessment and taxonomic investigations of flora and fauna are an essential basis for nature protection, and ensuring future human development. Moreover, investigations into the changing dynamics of separate species in different regions, and of communities as a whole are required. With appropriate level of taxonomic studies and monitoring of the biodiversity status, we can identify the intend of animals and plants in current habitats, determine trends for changes and the most vulnerable species.

Armenia has signed and ratified the Convention on Biodiversity in 1993 and undertaken the responsibility for biodiversity conservation in the Republic. Despite of the hard social and economic conditions, a lot has been done to implement obligations undertaken by Convention.

Given the demands of the Convention, Armenia should use all possible opportunities to prevent extinction of any species on its territory. Obviously, first of all this is related to rare and endemic species, species with a short range, and plants and animals of special interest (scientific, economical, etc).

Natural ecosystems are considered as open systems, responding to the impact of different factors, - abiotic (first of all climate change) and biotic (the most important is anthropogenic, the impacts from human activity). There is a fine balance between an

ecosystem and the animal and plant species it hosts. The conditions in an ecosystem can be considered to reflect the constituent species. Changes in the species also reflect changes to the system. For these reasons, it is important to monitor:

- the status of populations;
- trends of changes within the populations as a result of possible changes of ecosystems;

In order to determine the status of populations, it is essential to undertake taxonomic investigations. The first and most important step is to determine the species inhabiting on the different territories. The importance of solving this problem is obvious - we need to know exactly what are we going to protect. Inaccurate taxonomic data may lead decision-makers to squander resources on protecting species which have a large distribution and are not really threatened. Meanwhile, rare species are not protected.

To solve the second problem, long term regular observations of natural ecosystems are essential, registering current changes, analyzing income data and forecasting future changes. Those activities can be provided by a biodiversity monitoring system. Hence, the importance of permanent biodiversity monitoring is beyond doubt. Without accurate forecasts of changes to ecosystems, a lot of planned nature protection measures may become ineffective, or worse, they may even damage nature.

TAXONOMY IN ARMENIA

Ideally, investigation of biota (of all living organisms at levels of species, gene and ecosystems) must cover 100% of all the territory. A full catalogue of all the species (flora, fauna, etc) should be created. A caryological investigation is essential to determine variability and changes within species. In addition, all the existing ecosystems of the republic have to be investigated and described.

Unfortunately, due to resource constraints, even in the most developed countries these investigations are limited to small territories.

There is always an ongoing process of change, affecting both species and their range. As a result, the taxonomic investigation of living organisms on any territory has to be a permanent process. So, it is impossible to reach an ideal model in this area. It is important to achieve a more or less equal taxonomic investigation of all the different groups of living organisms.

1. Flora

Investigations of plants diversity in Armenia started more than 200 years ago, although systematic investigations of Armenian flora and fauna started in the 1920's. In the 1940's and 1950's, the academician Takhtajan undertook profound investigation on the flora of highest plants of Armenia. This work was done to support academic researches and was resulted in a number of scientific publications on taxonomy, including 10 volumes of "Flora of Armenia". For the future, we can assert that the thorough investigation of the flora of the republic should essentially aim at biodiversity conservation and implementing the articles of the Convention.

1.1. Level of studies

Algoflora has been investigated less then mycoflora, and data on lichens in Armenia is limited. When considering taxonomic research at the *species level* we can point to obvious insufficiencies in the level of knowledge of the different groups. This is briefly explained below:

- **Bryoflora (mosses)**

Two classes of glues (Marchantiopsida or Hepaticopsida; and Bryopsida or Musci) - are investigated to a good level. Continued research, first of all on the distribution of the representatives of bryoflora across the territory of Armenia and on their connection with the various ecosystems is necessary. The thorough taxonomic investigation of Marchantiopsida, as well as caryosystematic investigation of all the mosses species is important.

- **Lycopsida and Sphenopsida**

Both groups of plants are represented in Armenia by a small number of species. The results of previous research were generalized in the first volume of " Flora of Armenia " (1954). At the present time it is necessary to revise this from the viewpoint of modern

systematics. Carosystematic and comprehensive investigation on the DNA level of is important .

- **Filicies (Pteropsida) (ferns)**

Taxonomic investigations have been rather well implemented, though there is a need for more in-depth researches. First of all comprehensive caryological and investigation on the DNA level of is important

- **Gymnospermae**

There are not a large number of representatives of this class in Armenia. The results of previous research can be found in the first volume of " Flora of Armenia " (1954). This requires updating at the present time. comprehensive caryological investigation is important to identify taxonomic status of the species.

- **Angiospermae**

Cover the most part of the flora and the most economically and environmentally important components. Cover the absolute This class has been investigated very uniformly. The majority of the representatives of dicotyledones were studied a very long time ago and, it is obvious, that the majority of families are included in the first 7 volumes of "Flora of Armenia". This requires serious revision and additional study. On other families, which were processed later, the additional material has already been saved. Some of them require small additions and changes. Monocotyledones have been studied, the investigation should be continued further, and the research needs to be continued. Taxonomic investigation of all the species on the caryological and DNA level of is important .

- **Fungi**

A huge variety of fungi of Armenia has been investigated rather non-uniformly. Peronosporales, gasteromycetes, and afilophorous, gifomycetes, spheropsid fungi (with colorless clinous conidies) have been sufficiently investigated, though a more in-depth research is necessary.

- **Algae**

Very important component of biodiversity, particularly in the wet habitats. For the most ecosystems are a part of the tropic chain

The level of investigation of this modular group of lowest criptogamic plants in Armenia is absolutely insufficient. First of all it is important for Armenia to investigate algae on the morphological-taxonomic level, with applying the modern taxonomic methods if possible.

- **Lichen**

The level of investigation of is absolutely insufficient. The group is very important on a lot of viewpoints. Lichens are one of the pioneers of new habitats. In the most cases they are indicators of pollution. More or less are investigated lichens just some regions and most of all stone lichens. In fact the lichens of trees and other habitats are not investigated at all.

Actually, the flora of Armenia is not investigated at the *genetic level*. The separate groups of vascular plants have been investigated at the chromosome level - in most cases the number of chromosomes has been determined. The morphology was characterized less often. For example, the Lactuceae tribe, genus Allium and some others.

Taxonomic research at the DNA level was not carried out, due to the lack of appropriate equipment and absence of experts. However, through the work of some foreign scientists, some isolated data does exist, based on material obtained in Armenia.

At the *ecosystem level* the plant-animal-soil-microorganism complex, or the vegetative world, are not at all investigated. However, it is important to note that a base for these investigations does exist. The vegetation of the Republic has been rather fully investigated, and the classification of plants communities in most cases up to the level of associations has been undertaken. Especially intensive researches of plants communities were carried out during the 1950-s, when the passportization of fodder areas was undertaken. In the following years, the separate regions and separate types of vegetation were studied. Investigations at the level of microgroups (as in West Europe) have not been carried out in Armenia.

The level of taxonomic investigation is related to the methodologies for undertaking taxonomy and the available training in the field of taxonomy. Information on the different methods of taxonomic investigation ongoing in Armenia is given in Table 1.

Table 1

TAXONOMIC STUDIES ON PLANTS BIODIVERSITY OF ARMENIA

Organization	**Taxon investigated**	**Investigation methods**	**Studied**	**Without application of**	**Training**
NAS, Institute of Botany	Highest plants	Morphological-geographical Caryological	Separate groups rather fully	DNS Analysis cluster	PhD graduates
			Separate groups rather fully		
		Palinological	Separate groups rather fully		
		Anathomical			
	Fungi	Serological Morphological	Separate groups very poor poor		
Yerevan State University	Fungi	Morphological	Separate groups rather fully	Complex (biochemical, genetical, cellular biology)	Students, PhD graduates (on highest plant extremely poor)
Agricultural Academy	Highest plants (particularly wild relatives of cultivated plants	Morphological Caryological	Separate groups rather fully		PhD graduates (students – poor)
State Pedagogical Institute	Highest plants	Palinological	Recently very poor		Currently extremely poor

1.2. Technical capacities to undertake taxonomy studies and related disciplines

Human resources

The level of taxonomic research depends, to a large extent, on the existing quantity and training of training for personnel. Today, the situation looks to be unsatisfactory. No more than 10 persons are actively engaged in taxonomic researches of higher plants in Armenia, with an average age of over 50. Though Yerevan State University and the Armenian Pedagogical Institute both offer courses of plant taxonomy, as of yet not a single student has specialized in the area of taxonomy. This has resulted in an absence of working taxonomists in universities, and no supply of taxonomists to research institutions.

No university prepares experts skilled in modern methods, particularly in caryology and palinology. In addition, there is an absence of modern equipment for implementing these methods. As a result, taxonomic researches at the genetic level practically do not exist in the Republic.

There are no experts capable of carrying out taxonomic research at the ecosystems level in Armenia, nor is there any training for such experts. Groups of scientific experts in different areas (botanists, zoologists, soil scientists, microbiologists etc.) are necessary to implement similar research.

From the 1950s till present, most of the specialists are engaged in the field of mycology, some working inside the Institute of Botany of the National Academy of Sciences, as well as in a number of the Republic's scientific research and educational institutes. The Biology faculty of Yerevan State University is a scientific center and the only University which prepares specialists on criptogamic plants – algologists, mycologists, lichenologists.

There are practically no specialists in algology nor lychenology in the Republic.

Information exchange

Most of the taxonomic data is published in official media (for example the multivolume "Flora of Armenia" and "Mycoflora of Armenia ", and in monographs and articles in scientific magazines, etc.). Basically, this is quite accessible both to the official persons and to the general public. However, the 9^{th} and 10^{th} volumes of " Flora of Armenia " were published in Germany and quickly became a bibliographic rarity in Armenia, due to its high price. It is also important to recognize that the data is published as a scientific work, and a specialist training is necessary to fully understand it.

For several reasons, it is particularly difficult to publish results of studies. Firstly it is irregular botanical publications in Armenia. Hence, Armenian scientists are compelled to send their papers and articles abroad for publishing. That limits the accessibility to those items for the population of Armenia. The former environmentally sound popular scientific magazine, "Hayastani Bnutyun", has been closed down due to lack of finance. "Flora, vegetation and plant resources", a publication of the Armenian botanical society, appears very irregularly, due to financial hardships.

Separate computer databases have been developed, or are under development in botanical organizations of Armenia. These include:

1. On flora of Armenia;
2. On the Red book of Armenia;
3. On Endemic species of Armenian flora;
4. On macrofungi.

The databases of the herbariums in the Institute of Botany and Yerevan State University are especially valuable. These can become a basis for creating a computerized database on the flora of Armenia. The scientific herbariums at the faculty of Botany of Yerevan State University can serve the same purpose. They hold about 4,000 species and more than 13,000 samples of fungi, algae and lichens.
The databases are not accessible for general use.

So, analyzing the present status of taxonomic study of Armenia`s flora biodiversity, we can conclude: Biodiversity in Armenia is investigated very unevenly. Taxonomic study at the species level should be continued (first of all on the poorly investigated groups of living organisms). In addition, studies at the gene level should be expanded, and investigations at the ecosystems level should be initiated. To achieve these goals, it is essential to develop target institutions, and review the network of the taxonomists. As a secondary output, the availability of data for biodiversity taxonomic study in Armenia should be improved, both for decision makers, and for a wide audience.

2. Fauna

Despite its small territory, Armenia has a diverse and unique fauna. This includes about 500 species of vertebrates and 17,000-17,500 invertebrates.

2.1. Level of studies

The uniqueness of Armenia's fauna has attracted scientists since a long time ago. Regular research into the Republic's fauna started in the 1920s -1930s, mainly by foreign scientists. Armenian scientists then continued the research. This resulted in monographs (more than 100), including 15 volumes of fauna, 7 determinants, 23 fauna magazines, as well as materials at national and international workshops. The Red Book on Animals of Armenia was published in 1987.

It should be stressed that the level of understanding of different groups is not equal. No taxonomic articles exist for many taxonomic groups. The inventory on fauna is far from complete, and we can just see the approximate picture regarding the specific structure of vertebrates (Table 1).

As for flora, the main studies of fauna has been undertaken at the species level. Very few studies have been done at the ecosystems and landscape levels. We do have some data on biocenose groups (bees, birds, reptiles), but not for the entire zoo complex. Aquatic ecosystems are better studied through a complex approach. Research has started on zoo complexes of living soil animals and their ways of formulating. Global studies on biogeocoenosis do not exist. To achieve this, it is not only essential to have cooperation amongst specialists from different taxonomic groups, but also to develop new approaches.

Biodiversity research at the gene level is also rare and limited generally to studies on chromosome pools within some taxonomic groups.

Information on the number of species, the level of investigation for each species and the number of specialists is provided in table in Annex

2.2. Technical capacities to undertake taxonomy and related disciplines

Taxonomic study in Armenia is mainly financed from the state budget through a number of scientific institutions (see Table 2)

Table 2

Name of Institution	Research groups
Institute of Zoology of NAS RA	Different groups of vertebrates and invertebrates
Institute of Hydroecology and Fishery of NAS RA	Wetland vertebrates and fish
Yerevan State University	Vertebrates (amphibians, reptiles,) and insects
RA Pedagogical University	Fishes, birds

Methodologies

The majority of taxonomic researches of higher plants is carried out using the classical morphological -geographical method. In addition, some modern research methods are used: first of all - anatomic, caryological and palinological methods. However, at present, due to the insufficient technical base and the small number of experts, these researches are carried out insufficiently and with application of old technologies. In recent years, some attempts to use the methods of statistical processing of morphological attributes, aimed to organize the pasportization process, were undertaken. These gave interesting results, but were not developed any further. The cluster method was never applied. Also the serological method was used, however due to the hard economic conditions, this method is practically never applied. Due to the absence of equipment and experts in the Republic, methods of molecular biology, in particular DNA analysis, are not applied. In Soviet times, electronic microscopy was widely used (the material was processed in St.-Petersburg). This opportunity is now lacked.

A number of issues in modern mycology, including taxonomy, can only be solved on the basis of the complex approach, using the combined methods of biochemistry, genetics, molecular biology. Insufficient equipment and technical supply, as well as weak cooperation amongst the appropriate organizations conducting works in this field, create additional problems for the development of mycology in Armenia.

Animals collections do exist in Armenia:

- Institute of Zoology (zoological museum, insect collection, bone collections)
- Institute of hydroecology and fishery of RA
- Nature Museum of Armenia
- Yerevan State University (Zoology Department)
- Pedagogical University of Armenia
- Agricultural Academy of Armenia
- Private collections

The main method for obtaining samples for taxonomic studies is field collection (Natural) through field trips. Taxonomic studies require the long term conservation of collected material. To this end, scientific collections in Armenia have conserved samples of Armenian fauna, including endemic, rare and threatened species. Traditional methods are used to collect and conserve material. The conditions for conserving collected exhibits are the same as in soviet period and very insufficient. Lack of finance limits the capacities to expand the collections.

Human resources

Currently there are 60-70 taxonomists on fauna diversity in Armenia. Training specialists is a long term task. They are being trained in appropriate Universities (Yerevan State University - Zoology Department; the Pedagogical University of Armenia, and the Agricultural Academy of Armenia). It is planned to introduce the main principles of taxonomy within this framework.

Higher education is implemented to Master and Doctorate levels. Specialists in biodiversity and taxonomy are trained within the Republic of Armenia's National Academy of Sciences and in some universities. In Soviet period, USSR Universities and Research Institutes played an essential role in the educational system, and through this system national specialists were trained by leading scientists. Nowadays, due to lack of finance and weak international relations, it is hard for Armenians to cooperate with specialists from other countries.

The current educational system regarding taxonomy can not be considered successful, as there are no specialists in a number of taxonomic groups, despite the clear need for long-term, in-depth taxonomic investigations.

Information dissemination, awareness and publications

The main way for scientific information dissemination is publication, such as through monographs, articles, workshop materials, as well as popular essays. Possibilities for publishing monographies are currently limited, as if they require financing. Special magazines in the republic are:

- "RA NAS information bulletin",
- "RA NAS reports",
- "Armenia Zoological Magazine",
- "Yerevan University Magazine",
- "Yerevan State University scientific information bulletin",
- "Healthcare",
- "Armenia Medical Science",
- "Nature of Armenia"

Due to limited financing, the mentioned magazines are not published regularly. Workshop materials and abstracts essentially contribute the process of information dissemination. During the last 10 years, 10 workshops were held in Armenia (both national and international), where information on biodiversity was represented.

Radio and television is also used for information dissemination, but very irregularly.

It is essential for scientists to participate in international workshops, but the cost for them is a huge obstacle to this.

ACTIONS TO BE UNDERTAKEN

Short term(1 year)

- Strategy on biodiversity conservation and government decision where the responsibility of MNP in the field of biodiversity taxonomy and monitoring is clarified.
- Establishing a board on taxonomy and monitoring with participation of leading specialists in taxonomy, ecosystems and nature protection. Responsibilities of the board should cover identification of priority areas of investigation(the less investigated areas of taxonomy, including biodiversity analysis on the gene and ecosystem levels.)
- Identifying a governmental body responsible for recourse mobilization for investigations in the field of taxonomy(for example GEF, CITES, ---

Long term(5 and more years)

"Requested" taxonomic investigations(on support of additional financial recourses)

MONITORING OF BIODIVERSITY IN ARMENIA

INTRODUCTION

Environmental monitoring is a multi-purpose complex task. The basic tasks are supervising, assessing and forecasting the state of the environment and its components. Depending on the purpose, different parameters - geophysical, geographical, geochemical, biological are used. Biological monitoring carries out a number of tasks, including structure of species, number of populations, ecosystem network, general biological weight, etc. In terms of area, monitoring should be local, regional and global (covering the entire biosphere). A monitoring system includes information (registration, accumulation and analysis of information) Without monitoring, it is impossible to develop ways and methods of preventing undesirable impacts and changes in nature. In order to protect different biological (species, landscapes etc.) objects, we need to define their extreme richness.

In this connection, it is clearly impossible to monitor the entire network or even the majority of its components. Therefore, it is necessary to develop a system of indicators, which, if well prepared, will provide an indicative representation of the overall situation. This should help forecast the future situation and help prepare responsive measures.

Biodiversity monitoring should be multilevel and multicomponent and thus should be connected to monitoring of other natural components. In order to analyze the data received, it is necessary to compare it with that received from neighboring geographical regions. For this purpose, the appropriate structures for a free information exchange are necessary.

Ideally, the first level of a monitoring system should be based on long-term regular supervision over the changes in the state of individual flora and fauna species populations.

The second level of biodiversity monitoring should observe separate ecosystems, record and analyze all the changes, and note their occurrence under the impact of different factors.

At the third level, it is necessary to observe changes in the structure of flora and fauna of the republic. (Note, this level is extremely important from the biosafety viewpoint. The early determination of alien species invasion considerably raises the probability of successfully combating them). Naturally, such a global biodiversity monitoring system is absent even in the developed countries.

In order to improve concrete practical nature protection measures, it should be enough to monitor populations of the most important (rare, disappearing, endemic, economically valuable) species and reference ecosystems, as well as activities giving early indications of alien species invasion. Usually, monitoring changes of those or other indicators should be enough to reveal the condition of separate species and ecosystems populations. However, if a more detailed indicator system is developed and used, it may be possible to provide a more thorough determination of ecosystems and of the

populations of separate species populations. And it may be possible to provide more exact forecasts.

1.Current State of Monitoring

1.1.Legal framework

Biodiversity conservation is impossible without a relevant legal framework. RA Government has adopted a number of laws, but the area needs further improvement. Both the "Law on Fauna" and "Law on Flora" have foreseen improvement of monitoring system. For example article 12 of the "Law on Flora" " State monitoring of flora is implemented in purpose of conservation and sustainable utilization of flora. Monitoring of habitats and ecosystems status is held as well." Holding and maintenance of monitoring upon flora are under mandate of an organ liabled by RA Government for protection, conservation, use and reproduction of RA flora.

Currently it is RA MNP.

The Charter of State Monitoring Center on environment identifies the responsibility of Center on biodiversity monitoring.

The legal basis for biodiversity monitoring and conservation is as follows:

1. RA Law on Fauna , Article 6 (competence of liable state person), point [1].) (organizing and implementing biodiversity monitoring on fauna, implementing by monitoring center of RA Ministry of Nature Protection)
2. Principles of RA legislation on Nature Protection, Article 13. " Monitoring for State Ecological survey;
3. Function on monitoring on Flora and fauna is fixed in Legislation of "Center on monitoring the natural environment".

1.2. Supervision/ coordination/ management arrangements:

At present, there is no coordinated biodiversity monitoring network in Armenia at any level. Not any organization - state, scientific, public - regularly supervises the state of separate species of plants and ecosystems. The Center of Monitoring operates under Ministry of Nature Protection. The Center does not supervise biodiversity monitoring (although, according to its founding "Regulation", this is one of its functions). It only monitors surface water and the state of the atmosphere. The system for collecting biodiversity data does not operate in many regions of the country; there is no developed network for the storage, analysis, assessment of data and forecasting.

1.3. Ongoing Monitoring:

Certainly, in Armenia, there are centers and services monitoring various components of the environment and their data, to some extent, can be used to contribute to monitoring of the condition of biodiversity. (See table 3)

Table 3

GOVERNMENT ORGANIZATIONS, RESPONSIBLE FOR MONITORING

Organization	***Monitoring upon***
The Monitoring Center of the Ministry of nature protection	surface waters; condition of air of the large settlements
The center for biosphere researches of the NAS RA	Data on accumulation of industrial emissions in vegetative, animal organisms, soils, water, air.
Institute of zoology NAS RA, Institute of botany NAS RA	Data on structure, number and distribution of some species of plants, vertebrates and invertebrates, revealing of species - indicators of environment.
Hayantar	Assembling and analysis of the data on changes of the wood areas, forests special structures, stocks, cuttings down, forests diseases and wreckers, separate animals and plants species of economical significance.
Protected areas network	supervision of various plant and animal species on territory of reserves. Some of them have lists of special structure of separate groups of animals (Dilijan, Khosrov)
Hunters unions	the data on the game animals state (mammals, bird)
Institute of hydrobiology and fishery NAS RA, fish facilities	Assessment of fish stocks and some water organisms
The Ministry of Nature Protection	licensing for gathering plants and animals for scientific purposes, fishing and hunting
Quarantine service	information on import and export of quarantined objects (plants, animal, microorganisms)
Institute of virusology, Center of especially dangerous infections Institute of national health	information on activators and carriers of especially dangerous man and animal diseases
Institute of protection of plants	information on the wreckers of agricultural plants, wood and barns

Previously, a number of state organizations collected related data. These systems are no longer functioning. However, with some appropriate financial support, and the rehabilitation of the staff and experts, and some minor revision of the assembled data parameters, and the simplification of access to these systems, they could be incorporated into a modern biodiversity monitoring system for the country. The most important organizations in this connection are the data assembling systems within the Ministry of Nature Protection, Hayantar, Ministry of Agriculture and the Ministry of Healthcare of Armenia. These are detailed below:

The Ministry of Nature Protection regularly collects and analyzes the data on the state of the environment. These data are transferred to the State Statistics Inspection. These data, if exactly interpreted, could become a part of a system of indicators of ecosystem status, with average levels of accuracy and detail. However, the reliability of the received data is very poor due to the lack of the staff and financing for the primary data system.

In Hayantar, previously, there was an exact system of data collection and analysis related to the state of forest resources state, including the state of the economically most valuable animals and plants, and separate species populations. These data could be used for monitoring forest diversity. However, the economic and energy crises practically completely destroyed the system of collecting initial data. Currently the local information is not reliable.

In the Ministry of Agriculture a real basis for monitoring does exist, both of pests and of diseases of rural and forest economy. Now this system practically does not work.

Within the Ministry of Healthcare, the system is closest to the purpose of data gathering for biodiversity is that of the Center for Prevention of most dangerous infections. This is the unique up to date system in the country, conducting a systematic monitoring of territory. It monitors rodents as carriers and transmitters of most dangerous infections. Objects of monitoring are background Rodents in open landscapes and their ecto-parasites. The data can be used additionally for ecosystems monitoring, from hills up to the subalpine mountain zones. Unfortunately, the activities and the finance were reduced due to economical situation in the country, and the equipment and labware became outdated. Also, the amount of the working experts was reduced to less than 50%, and only pension aged specialists have remained.

Finally, biodiversity monitoring in specially protected areas is not carried out. This is firstly due to the absence of the specialist staff. Some data on the number of species and the state of separate representatives populations exists in the Ministry of Nature Protection. This data is not complete and is not absolutely authentic.

Though in some Armenian research institutes there is an opportunity to undertake comprehensive research with the joint objective of contributing to biodiversity monitoring, these actions have practically stopped, basically, because of the absence of finance (both targeted and general). The data from routing and stationary researches from the past years is basically accessible and, in the case of appropriate financing and willingness, can be used in the future for comparison, analysis and forecast.

1.4. Human resources

Developing the resources requires the training of specialists, the retraining of related experts, and finding mechanisms to involve the wider community in helping monitoring.

No universities in Armenia have specialists skilled in biodiversity monitoring, though many of them have capacities for those activities.

At present, Armenia does not have the required specialists and experts. Here, foreign support is needed, in order to train some national experts, and provide technologies, in order to construct an appropriate education system. Within the commercial and private universities, specialists preparations have only been undertaken in Armavir "Ararat" University and Vanadzor "Lori International University". These were established recently, there has only been one release, and there is not yet any information regarding the quality of the graduates.

With appropriate retraining (at a minimal basis this means on primary data gathering, and at a higher level on analysis and forecasting) directed at biodiversity monitoring, the graduates of Yerevan State University, Armenian pedagogical institute, Vanadzor State Pedagogical Institute (specialty "biology") and Armenian Agricultural Academy (specialties "forestry", "agronomics", " Protection of plants ", "agro ecology" and " genetics and selection of cultural plants ") could help monitor biodiversity.

The preparation of a cadre of experts on biodiversity monitoring has some unique features. It requires a rather wide number of people, all available to be involved in biodiversity monitoring - students, local experts (teacher of biology, agriculturists, inspector of protection of a nature, workers of timber enterprises).

RECOMMENDATIONS

Armenia currently has many opportunities to create and develop the system of biodiversity monitoring and to implement in-depth taxonomic researches. These are described in table 2. Table 2 also describes limitations, first of all, due to economic conditions .

Table 2

Modern condition and development of the biodiversity monitoring system and taxonomic researches

Positive aspects and opportunities	*Negative aspects and limitations*
Extremely rich biodiversity of Armenia	Misunderstanding the importance of taxonomic research and biodiversity monitoring by decision makers, according a low priority to this field
Adoption of NEAP and BSAP	Insufficient implementation of the projects
Specialists with capacities to undertake comprehensive activities on taxonomy and monitoring	Most of them are aging Lack of specialists on separate taxonomic groups
Great amount of local specialists (students, teachers, environment workers) can facilitate and implement initial data assembling.	Training failure.
Large areas of specially protected areas, could serve as model areas for biodiversity monitoring	Lack of SPA network, local specialists, traditional approach to ecosystems monitoring, misunderstanding the importance by SPA authorities.
Higher education institutions with a good curricula and capacities to organize specialist training on taxonomy and monitoring.	Insufficient financing, lack of modern technical supply and lack of trainers in the high education Lack of coordination amongst scientific institutions. Out-dated curriculas.
Existence of the Center on environmental monitoring	Lack of biodiversity specialists in the Center, insufficient financing and equipment, no desire to develop biodiversity monitoring
Interest in the biodiversity of Armenia by the international scientific community	Lack or insufficiency of international scientific cooperation, small number of publications on Armenian biodiversity in the international scientific publications.
Rather full taxonomic investigation of biodiversity.	Unevenly investigated biodiversity, lack of specialists in separate taxonomic groups

Capacities to conduct joint scientific projects with international organizations.	Lack of coordination and scientific links, shortage of international researchers
Possibilities of financing projects by international funds, CBD Secretariat, Armenian Diaspora	Lack of advertising and system of involving international donors.
Monitoring units in different organizations and ministries, capable to provide data related to biodiversity monitoring.	Lack of coordination, information accessibility.

Regulated and comprehensive system of monitoring never existed in republic. In the area of biodiversity monitoring the responsible agency is the "Center on ecological monitoring" of the Ministry of Nature Protection. In fact, the Center does not have an adequate structure, staff and financial capacities for implementation. Currently, the Center monitors water and air pollution. Up to now, an ad hoc inventory has been made of the rare and threatened animal species of economical importance. The legislation is inaccurate, there is no concept on biodiversity monitoring, comprehensive management network. There are no skilled specialists.

The biodiversity investigation is mainly financed from the state budget. Recently due to shortage of budget allocations to the scientific sector, the financing levels and technical supply for biodiversity monitoring and taxonomy are insufficient. The comprehensive financial means needed to provide a collection of materials, the protection and expanding of collections, and applying modern technologies is lacking. The laboratory equipment, transport, furniture was mostly purchased in the 1970's and 1980's, and does not match today's demands.

The management system needs to be improved in both the fields of taxonomy and in monitoring. A joint hierarchic management structure and monitoring network is to be created, including stationary and rotating observation units.

Currently the taxonomic investigations in the Republic are carried out without taking into account investigation levels of different taxonomic groups and needs of republic, due to the lack of any coordinating body and a state project on priorities.

THE STRATEGY AND ACTIONS TO BE UNDERTAKEN

To ensure the development of a thorough taxonomic investigation and the elaboration of a biodiversity monitoring network, the following activities are necessary:

Political level

- Adopting decisions on the field priorities;
- Adopting decisions on the appointment of responsible organizations and persons for taxonomy and biodiversity monitoring;
- Adopting decisions on the coordination of activities and the free exchange of information between different ministries and institutions;

Administrative level

- Coordination and information exchange

- Establishing and equipping responsible organizations;
- Distributing of goals and duties between different governmental and non-governmental organizations;

Immediate actions

- Elaborate and determine financing for pilot projects, where the future model for biodiversity monitoring can be tested.

Improving the biodiversity monitoring network

- To develop the concept on biodiversity monitoring in Armenia;
- To identify indicators to implement monitoring;
- Improve monitoring management system;
- To create a joint biodiversity monitoring network;

Taxonomic studies of Armenia's biodiversity

- To develop a concept on biodiversity in Armenia, justifying its importance through both a scientific and a business approach
- To elaborate a state project in the field;
- To create a biodiversity data base and establish national cadets on bio-resources;
- To conduct an inventory of the existing animal collections and to develop capacity building projects
- To improve the training network. In this purpose, it is necessary to develop and introduce comprehensive state educational projects matching the demands of the Global Taxonomy Initiative (GTI). .

Annex

FAUNA STUDIES IN ARMENIA

Main taxonomic groups			Species quantity total		*Level of investigation*				Endemi species
Type	Class	Order	Known	Estimate	High	Middle	Low	Not studied	
1	2	3	4	5	6	7	8	9	10
Protozoa									
Coelenterata									
Plathelminthes	Trematoda		130						
		Brachylaimida	9						
		Clinostomida	1						
		Cyclocoelida	9						
		Fasciolida	28						
		Nitocotilida	4						
		Opisthorchiida	4						
		Plagiorchiata	45						
		Strigeidida	28						
		Schistosomatata	2						
	Cestoda								
	Amphilinida								
	Aspidogastrae								
	Monogenea								
	Gyrocotylida								

CHAPTER III

ACCESSTO GENETIC RESOURCES AND FAIR AND EQUITABLE BENEFIT SHARING

INTRODUCTION

The issue of access to genetic resources and benefit sharing is of large importance at the current stage of global development, as it is directly connected both to conservation and sustainable use of genetic resources and to improving the national and global food safety.
The importance of the issue especially increased towards the end of 20th century, when, due to the increased threats to flora and fauna genetic diversity and to the development of biotechnology, the role and value of germplasm as an initial material in selection programs increased. In this aspect, wild relatives of cultivated plants have a special value, as they bear genomes related to resistance to drought, to disease and to pests. They represent a large interest for adaptive selection.

So the germplasm has turned into an asset of a high income. This has resulted in an increasing interest by firms and transnational corporations involved in breeding and seed- industry on the issue of possessing genetic resources diversity and gaining free access to the collections of genetic resources.

Vavilov and his school proved the concentration of centers of origin, and the distribution of agrobiodiversity, particularly in the tropical and subtropical regions. Today, these regions are generally located on the territory of developing countries. These countries do not have sufficient technical supply or scientific potential, and are not capable of ensuring relevant and sustainable conservation and effective use of genetic resources. On the other hand, developed industrialized countries which have a rather poor natural biodiversity, contain a huge genetic diversity in their gene banks.

Besides the Convention on Biological Diversity, other international documents were approved and accepted by the world community, influencing the process of regulating the access, control and possessing of genetic resources. These other documents include:

- The International Treaty on plant genetic resources (paragraph 5) has determined, that « … access to genetic resources of plants is free, but not free-of-charge »;
- The General Assembly of World Intellectual Property Rights Organization (WIPO) has ratified the special program (1998) on rendering technical assistance to the countries in development of the national legislation under the property rights in the field of a biodiversity;
- The Resolution of a FAO Commission 3/91 has determined the sovereign rights of the State on own genetic resources of plants.

Until recently, genetic resources were considered a common property. However, the entry into force of the Convention on Biological Diversity has changed this approach. Today, according to this Convention, each country has the sovereign rights over its own genetic resources. According to article

15 of the Convention («Access to genetic resources»), national governments determine access to their own genetic resources, which is enshrined in the national legislation. Simultaneously, the countries which have signed the Convention, should " … create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not impose restrictions that run counter to the objectives of this Convention conditions for simplification of access to genetic resources with the purposes of ecologically safe use by other Contracting parties and not impose restriction, which contradict the purposes of the Convention". Under articles 16 («Access to and transfer of technology») and 17 («Exchange of Information»), each Contracting party "… undertakes …to provide and/or facilitate access for and transfer to other Contracting parties of technologies that are relevant to the conservation and sustainable use of a biological diversity …".

The convention on Biodiversity has significantly changed the existing former principles of maintenance by access to genetic resources. The open and free approach to genetic resources of plants, carried out on a contractual and gratuitous basis, has been replaced by a mechanisms of free, but not free-of-charge access, based on joint ownership, bilateral or multilateral agreements between the suppliers of genetic resources and the users. Until the ratification of the Convention, the genetic resources had no price and were widely used in the selection programs as an initial material. The users of genetic resources had property rights upon the research results and the application of geneplasm, thus the origin of the geneplasm was not taken into account. Today, the genetic resources are considered to be a potential source of profit, and the profits received as a result of research into genetic resources is a subject of negotiation, providing fair ownership with the country of geneplasm origin, or providing compensation for genetic resources use.

- A number of the international documents was approved and authorized concerning access to new grades of cultivated plants and granting exclusive rights to the breeders, authors of grades, on usage and distribution of the breeding achievements, including:
- Resolution of a Commission FAO 4/89 - recognition of the rights of the farmers
- Resolution of a Commission FAO 5/88- a recognition of the rights of the breeders
- UPOV « the International Union on protection of new varieties of plants », paragraph 2- « each state, joined the Union, understands the rights of the breeders on granting a special protection or patent »
- « The Agreement on Trade aspects of the intellectual property rights », (TRIPS), which is a part « of the General agreement on the Tariffs and Trade », (GATT) - paragraph 27.3- « … all parties should adhere to the minimal standards for protection of the rights of the intellectual property, owing to what the grades of plants should be protected by the patents or alternative system of protection of the rights for specific patterns of ownership »

Currently the developing and operating international arrangements illustrate the need for establishing a global management network of trade arrangements terms in relation of genetic recourses. The aim of the network is to ensure fair involvement of all countries into the process of genetic recourses use and quarantine their optimal disbursement taking into consideration the environmental impact.

1. TOOLS FOR JOINT MANAGEMENT OF ACCESS TO AND BENEFIT SHARING FROM GENETIC RESOURCES USE.

Components

No country in the world can be self-sufficient in terms of genetic diversity or resources. Hence, there is a strong degree of interdependence amongst countries. Therefore, only by international efforts, can it be possible to take an exact decision of all key issues related to providing access to genetic resources and to equal benefit sharing. At the international level, several guiding principles have been established and approved. These include the principles of Prior Informed Consent (PIC) and on mutually agreed terms on which the access to genetic resources should be given (MAT). During the international meetings voluntary Guiding Principles have been developed serving as minimal standards for a system of Prior Informed Consent.

The voluntary guidelines assume creation of at least one competent national body in each country, with administrative functions to maintain the prior informed consent system. A national focal point should also be appointed, to deal as an adviser for access, to provide mutually agreed terms by participation in negotiations, to provide information to all interested parties and to communicate with the Secretariat of the Convention. The focal point and the competent national body may be the same agency. Competent experts, skilled on the status of species, and on their economic importance at national and international levels, are also to be involved.

The Guidelines cover the following:

- duties of all parties during scientific research into germplazm;
- distribution of research results;
- transfer of technologies;
- maintaining the principles of prior informed consent system;
- certification;
- cooperation;
- periodic reporting;
- financial compensation (e.g. royalties, financing scientific research, payment for the acquired samples etc.) and non-financial compensations (e.g. joint possession of the patents, professional training of the staff, sharing the results of scientific research and development, access to ex-situ genetic resources and to databases etc.)

These guiding principles introduce and define this new approach to the issue of access to genetic resources and sharing the benefits of their use on a fair and equal basis. The above list covers the main components of an integrated management system. Such a system would promote unobstructed export and free use of genetic resources of the country of origin. Such a system would also promote opportunities to generate both monetary and non-monetary

benefits. These benefits, if shared as compensation for the provider country, can be an important incentive to sustainable use of genetic resources.

2. INTERNATIONAL SAMPLES

There is a lot of examples of successfully operating equitable benefit sharing mechanisms between the country owning (providing) the given resources and country consuming. Some examples include:

1. A bilateral cooperation between USDA and Ecuador for a field exploration of hazelnuts was held in 1995 and 1996. The multiplied and described material was equally distributed between Ecuador and USDA. As a result, a fully described and documented collection on hazelnuts was created in Ecuador and students and the scientists of Ecuador have received training on management of genetic diversity. Long-term and mutually advantageous communications have been established between the scientists of Ecuador and USA.
2. International Network for Genetic Evaluation of Rice (INGER).

About 1000 scientists, in 95 countries of Asia, Africa, Latin America cooperate with International Rice Research Institute - IRRI, West African Rice Development Association - WARDA and International Center for Tropical Agriculture - CIAT.

The benefits to members of the network include:

- germplazm exchange between continents – since 1975 more than 40,000 samples of rice were evaluated through INGER. As a result, breeding lines originating from programs in 34 countries and the international centers selection lines have been realized as 575 varieties in 62 countries.
- increase in genetic diversity and enhanced sustainability - the distributed genetic material has resistances to many diseases and insect pests;
- the increase of volume of agricultural manufacture, particularly in less developed countries - for example, out of 12 varieties released in Cambodia, 10 came directly through INGER. They are cultivated on almost 100,000 hectares. Due to functioning of the mechanism of joint distribution of the profit, Cambodia became self-sufficient in 1995 for the first time for 25 years.

3. Another mechanism of income generation from use of genetic resources is fair benefit sharing by international networks. For example, the international network on genetics and aquaculture (INGA) was established in 1993 and involves 13 countries.

Non-monetary benefits include:

- co-coordinated exchange of fish geneplazm with the purposes of breeding and scientific researches - in particular leading to genetically improved species The *Nile tilapia* was transferred to 6 members of the network for further scientific research. Species of carp from Vietnam were transferred to Bangladesh, India, the Philippines and Thailand;
- assistance among the member countries in the development of the national breeding programs. For example, breeding programs on fins were developed in Vietnam and Indonesia with technical assistance from Norway;

- increasing scientific potential. With financial support from UNDP and the World Fish Center (ICLARM) in 1995, training courses on genetics were organized, where 32 participants from 11 countries formed a network;
- information dissemination between the members of a network - appropriate literature and documentation is regularly dispatched to all members of the network.

Thus, access to genetic resources is a tool to ensure benefit sharing and, ultimately, conservation and sustainable use of biological diversity.

3. SITUATION IN ARMENIA

Through signing and ratifying the Convention on Biodiversity, Armenia has proclaimed the sovereign rights to its own genetic resources and has undertaken obligations to solve the problems connected to access to genetic resources and equal benefit sharing.
A number of primary issues and the possible ways of addressing them are reflected in the "First national report on biodiversity of Armenia" and the "Biodiversity Strategy and Action Plan" (BSAP, 1999). According to the BSAP, the Republic should develop, adopt and implement programs addressing the conservation of the genetic pool for plants and animals and the sustainable use of agrobiodiversity. Moreover, a legal basis for the conservation and use of plant resources of the country should be formulated. This present assessment is prepared according to the offers and recommendations of NEAP, BSAP and I-PRSP, with the purpose of development of national policy for access to genetic resources and development and application of mechanisms of joint distribution of the profit.

3.1 The national legislation in the field of access to genetic resources

At present, Armenia has not developed any special legislation regulating access to genetic resources and the fair sharing of benefits resulting from their use. However, laws regulating different aspects of nature protection developed over the past ten years do influence the ABS system. (Appendix 1).

3.2 Information on existing genetic resources

A key step to solve and regulate the problem of access to genetic resources and benefit sharing is establishing an appropriate information base, covering both in-situ and ex-situ genetic resources.

IN-SITU

The complete picture on endemic, rare and threatened species on the SPAN is given in the information on specially protected areas of republic, where data on species status and necessary measures for conservation on territories of state reserves, state conservation areas and national parks do exist. Representatives of wild flora and fauna is covered in scientific publications, scientific monographs, and in the reports of appropriate organizations. Generally, the information is available to a wide range of beneficiaries, although the information has not been updated and does not reflect the present situation.

The information on the presence of genetic resources, their role in the maintenance of ecological balance in nature, and also the characteristics of the different plant and animal taxa, grade or breed is widely published in the various printed editions, including scientific articles and monographs, popular scientific magazines and reports on monitoring and taxonomy. As a rule, they are popular for a wide range of the users, including scientists in the field of botany and zoology, as well as professionals in the animal industries, breeding, farmers, and numerous public organizations.

The energy crisis in Armenia and the intensive economic activity have caused encroachments into habitats and ecological. As a result, some species of plants and animals are under the threat of disappearance, and the number of rare plants, valuable woods, and wild relatives of cultural plants has been reduced. Therefore, in most cases, the data on genetic resources of reserves has become outdated.

EX-SITU

Ex-situ collections play a most important role in making genetic resources available. The collections discussed below are the ones most frequently used as sources of geneplasm.

Important sources of information on animal genetic resources are the collections of the Institutes of Zoology, Hydrogeology and Fishery of the Yerevan State University, the Armenian Agricultural Academy and the Armenian State Museum of Nature.

Before privatization, scientific articles, catalogues and booklets were published describing and assessing the pedigree stock breeding at both the Republic and USSR levels. Besides, the state statistics system conducted an inventory on genetic resources and animal species number. Currently, these activities are partially conducted by the Armenian Agricultural Academy. Annually, a tender-based inventory of animals and birds number is conducted by state statistics inspection.

The basic seed collections of plants in the country are concentrated in the following scientific institutions under the Ministry of Agriculture:

- Scientific Center on agronomy and plant protection
- Scientific Center on melons and industrial crops;
- Armenian Agricultural Academy.
- Scientific Center on viticulture, fruit growing and winemaking

According to the scientific structure of the centers, ex-situ collections are established containing the profile crops their wild relatives. The information on volume of collections and features of stored samples is contained in the registers, and in the scientific publications as well.

Botanical gardens are located throughout the various administrative and floristic areas of the country, including the Yerevan Botanical Garden of the National Academy of Sciences, the Sevan botanical garden, the Vanadzor botanical garden and 8 dendroparks. These make a powerful contribution to the protection of the country's plant genetic resources and to their access.

During land privatization, many small farms were established in Armenia, some of which specialize in creating nurseries (especially berry and grapes). These private collections can also serve as a source of geneplazm. However, information on these is extremely limited. The farmers themselves Scientific Center on viticulture, fruit growing and winemaking monitor access to seedlings and sowing materials.

A national Center for microbes was created under National Academy of Sciences and the Ministry of Education. Currently it houses some 10,000 samples of bacteria, fungi, ---etc. A database has been created at this Center, including data on the morpho-physiological and biochemical characteristics of the cultures, as well as a "Catalogue of cultures of microorganisms " (published in 1996). Today, the Center of microbes deposit can serve not only for the purpose of microorganism's storage, but also for long-term conservation of tissue cultures, plant and animal cells.

A small collection of milk-acid microorganisms is conserved in the inter-departmental laboratory of sanitary, hygiene and expertise of meat, milk and dairy products of the Armenian Academy of Agriculture. The samples of the laboratory are used in the dairy industry for the preparation of bacterial ferments. Traditionally, the strain of microbes was granted to the beneficiaries gratuitously. Recently some of the developed samples have been sold as assets. In the museum of the Ministry of Healthcare, in the Center on the most hazardous viruses, about 160 cultures of contagious microorganisms are conserved. Access to them is strictly limited; the strains are available only for institutes undertaking scientific research into the plague.

3.3 The existing working mechanism managing access to genetic resources, and responsible organizations

At present, there is no comprehensive working mechanism. However there are many related practices, laws, institutions and specific mechanisms. The most important of these are described below.

Providing access to genetic resources should necessarily take into account the level of environmental impact. Therefore, export must be done according to the data of Armenian Red books, and the economic importance of the related species of plants or animals.

Access to genetic resources for internal use purposes practically is not limited for the species, which are not included in the Red book. Individuals for the home market may collect the genetic resources of useful plants. These activities cannot be a subject of inventory or control. The assembling and sale of plant resources is carried out also by different firms and organizations involved in commercial activities. In this case, their activities are under the

control of the Ministry of Nature Protection, which carries out licensing for the assembling and export/import from republic.

The genetic resources of plants and animals, both living and lifeless, have traditionally been granted without charge in response to inquiries from other countries, as an exchange for scientific or educational purposes. Hence, the seed collection of the Institute of Botany of the National Academy of Sciences in the past had a special exchange collection. The contents of this collection were available to all interested scientific institutions, both in-country and abroad. Owing to financial difficulties connected to the payment of postal expenses and the distribution of information, this mechanism does not function.

The protected areas system strictly regulates the access to in-situ genetic resources within the protected areas.

Scientific and economic species*: Scientific institutions possessing collections take independent decisions regarding information dissemination on the needed samples. Permits for exporting genetic resources are issued given by the Ministry of Nature Protection.*

After making the appropriate analysis, a phyto-sanitary certificate is given by State quarantine service on plants basing on export document and contract between the supplier and user.

The "Scientific Center on animal husbandry and veterinary " of Yerevan municipality carries out the veterinary control of imported and released animals and gives appropriate documents.

Hunting and industrial fishing permissions are given by Ministry of Nature protection based on data presented by the Institute of Zoology, the Institute of Hydroecology and Fishery and the "Armenian Hunters Society".

The Ministry of Nature Protection issues permits for gathering wild plants, based on the conclusions of the Institute of Botany.

In rare cases, individual animal species were exported from the country with the purpose of reintroduction.

Strains of microorganisms are frequently exchanged with the purposes of enrichment of genetic collections, or they may be given gratuitously for scientific and educational purposes. Some of them are given in exchange for a small payment.

3.4 Assessment of the working mechanism on providing access to genetic resources

Within the framework of access to genetic resources, at present there is no monitoring of the condition of natural genetic resources. This is endangering their numbers.

The most disputable problem within the issues on access and the distributions of the profit from genetic resources of plant relates to the forests of Armenia. According to the legislation of Armenia, forests are state property on the one hand, and, on the other hand, a part of the forest resources has been transferred to private property as a result of a privatization.

Private activities touch upon the issue of the distribution of profit from the use of genetic resources. The private nurseries, seed-industry farms and fine breeding facilities are outside of the state control. The distribution of benefit from the use of genetic resources is carried out through individual sales and purchase contracts.

The present day principles developed at the international level relating to the fair distribution of profit from study or use of genetic plasma practically do not function at the national level. The activity on in situ conservation of genetic resources is limited to organizing protected territories. There are no systems of monitoring the territories inside reserves and national parks. There are no developed mechanisms of the possible profit from eco-tourism and training.

The described mechanism of access is not always implemented in practice. The necessity to strengthen the customs mode and to strictly control the observance of the mechanism of access is felt by the Ministry of Nature Protection.

Given the above mentioned factors, it is extremely necessary to develop a national strategy addressing access to genetic resources and the distribution of benefits from their use on mutually advantageous conditions, providing a coordination for all activities in this area and concentrating of all the available information in a joint Center. Creating a National Coordinating Center, with administrative responsibilities, might solve existing problems, such as the reception of profit through the use of genetic resources or study by the owner and the development of benefit sharing based on consistent principles.

3.4. RA participation in access and benefit sharing mechanisms

Before independence, Armenia, as for all other republics of the former USSR, provided initial breeding material to the largest centralized institution - the All-Union institute of plant industry in St. Petersburg (known as VIR, and established by N. Vavilov). Within the framework of international projects, VIR has an opportunity to gather plant material from all the territories of the former USSR, including Armenia, through joint efforts. The form of ownership of these assembled collections is joint. Information related to the initial estimation of the material, assembled during the joint expeditions, is shared freely. This expands opportunities for the accelerated use of resources in the selection programs. Currently, Armenia cooperates with the VIR as a way to actively update collections.

The Center of Science of the Ministry of Agriculture cooperates with the Consultative Group on International Agricultural Research (CGIAR) in the area of gathering, evaluating, preserving plant genetic resources, and their use in selection purposes. In 1999, with support from the Australian Center for international agricultural research, and in cooperation with

VIR and the International Center for Agricultural Research in the Dry Areas (ICARDA), a scientific expedition to assemble cereals and grain legumes was undertaken. All costs for the expedition, in which both local and foreign researchers took part, were covered by the international center. The samples collected during the expedition have updated and enriched the seed collections of the Institute of Botany of the NAS, of the Armenian Agricultural Academy and of ICARDA.

The Ministry of Agriculture signed a cooperation agreement with ICARDA covering germplazm exchanges, scientific literature, information and methodology sharing, visits of appropriate scientists. Within the framework of this agreement, some Armenian experts have received ICARDA training related to databases and documentation. They are now sharing these lessons learnt in order to create a national electronic catalogue of cereals and grain legumes, fodder crops samples stored in the collections of the Scientific Centers of the Ministry of Agriculture. The expenses for training, purchasing necessary equipment and conducting databases are covered by the international center. The catalogue and the plants samples assembled during the joint expeditions are the property of the both national and international ex situ collections.

The Scientific Center on Agronomy and Plant Protection, potato seeds production station and CIP (International Potato Center) also have a joint program of activities on potato virusless mini-tubs production.

In 2000, the Ministry of Agriculture signed an agreement with USDA/MAP (USA Marketing Assistance Project) covering cooperation in germplazm exchange between USA and Armenia. Within the framework of this agreement, USDA/MAP has covered the costs of training, in the USA, of Armenian experts in techniques to create databases. USDA has also financed a number of expeditions on Armenian territory to collect wild relatives of cultivated plants, with the participation of American researchers. In return, USDA has received access to Armenia's genetic resources and the opportunity to use these resources in the selection programs, through the joint ownership of the collected samples.

Thus, cooperation with international and foreign organizations can provide monetary and non-monetary benefits in exchange for access to and use of genetic plasma at the national and international level.

3.6. RA participation in capacity building projects

In 2000, Armenia was included in a five country (with Bolivia, Madagascar, Sri-Lanka, Uzbekistan) regional UNEP/GEF PDF B project, coordinated by the International Plants Genetic Resources Institute (IPGRI). The project addresses the in situ conservation of wild relatives of cultivated plants through the strengthening of management and information use. The purpose of the project is to assemble scattered information from national and international sources on wild relatives of cultivated plants and establish an information system. The financing party covers the costs of collecting information on ex situ and in situ collections to provide mutual access to available data on wild relatives.

Since 2000, Armenia became the full member. The Ministry of Agriculture coordinates activities in Armenia. Within the framework of the European Cooperative Program of the International Plants Genetic Resources Institute is creating a national electronic catalogue of seed sample collections and has integrated it into the European catalogue (by the end 2001). Implementation of this project will considerably facilitate mutual access to information concerning plant resources at the European level.

RECOMMENDATIONS

The republic should solve a number of important tasks related to the development of the appropriate policy, development of a co-coordinated management mechanism for fair sharing benefits from the use of national genetic resources, and also for access to general information on genetic material. The following outlines some of the necessary steps.

1. Development of national strategy on access to genetic resources and fair benefit sharing

Development of national policy in this area is a priority task. Policy should create the potential for providing access to genetic resources and sharing benefits.

With the objectives of ensuring global food safety, satisfying the growing food needs of the population in food, and operating a multilateral system of cooperation, the state policy should aim:

- To facilitate access to the information on genetic resources;
- To provide access of information on world genetic resources at national level;
- To facilitate access to genetic resources and technologies for their use in accordance with the Convention on Biodiversity, which establishes new international rules and adjusts issues on access to genetic resources and fair benefit sharing;
- To take into account possible adverse environmental impacts;
- To carry out state regulation of the export of genetic resources, with the purpose of conserving national resources and controlling benefit sharing. .

2. Improving the management structure of access to genetic resources and benefit sharing

To ensure coordinated activities of access to genetic resources of the country and equal benefit sharing and according to the requirements of Secretary of the Convention on Biodiversity it is necessary to establish a National Coordination Center, with duties and obligations as follows:

- coordination of activities in the republic on access to genetic resources of plants, animals, microorganisms;
- licensing access (import and export) to genetic resources, establishing principles of transparency and availability for any interested party;

- identifying the list of available resources, taking into account the basic priorities, including:
- Importance for food safety;
- Interdependence of the countries from these genetic resources;
- Status of genetic resources;
- disseminating information among the local and foreign applicants concerning procedures on access to genetic resources and benefit sharing;
- Providing information on possible partners (organizations involved in protection and sustainable use of genetic resources) to potential consumers;
- processing applications for access, ensuring prior informed consent is adequate, and concluding mutually agreed terms of previously approved consent systems ;
- preparing contracts, and developing national procedures on access to genetic resources and benefit sharing;
- Supervising the agreements on access to genetic resources and benefit sharing, including control upon use of genetic resources according to terms of access, process of scientific researches both development and application of the patents;
- Consulting on the requirements concerning access to genetic resources on mutually agreed terms;
- Negotiating between the interested parties on access and benefit sharing, development of mechanisms of effective participation of the various interested subjects;
- Communicating with the Secretary of the Convention, searching for and translating necessary documentation

The national coordinating center undertaking the above listed activities should not necessarily be an independent structural unit. The functions and authorities can be assigned to existing departments of the Ministry of Nature Protection (flora and fauna department), where appropriate experts should be involved.

The national coordinating center, besides a Chief and an assistant, should include the following experts - botanist, zoologist, microbiologist, expert on agricultural structure, lawyer, expert on information systems and databases, interpreter and a specialist on communications with partners and stakeholders. In view of the economic crisis and the recent reorganization of the Ministry of Nature Protection, organization and the functioning of the National coordination center, at least initially, should be financed by international agencies.

Initially, it is necessary to nominate a Focal Point which will be responsible for: carrying out communication with the Secretariat of the Convention to develop a strategy of access to genetic resources; creating the National coordination center, and assembling available information with the purpose of concentration at the joint center.

3. Development of contractual agreements on access to genetic resources and benefit sharing

The former mechanism of free access should be changed into a free, but not always free-of-charge access, based on bi-lateral or multilateral agreements. This may require:

- developing standard or model contracts/agreements between the supplier and user of transferred material;
- developing procedures for prior informed and approved consent;
- developing acceptable mechanisms to generate in-country monetary and non-monetary benefit;
- developing mechanisms of income generation from ex-situ and in-situ collections by cooperation with foreign institutes, international research centers, local and foreign commercial organizations;
- training experts and advisers on assessing genetic resources and equitable benefit sharing from their use, and developing the skills for negotiating contracts;
- implementing measures to raise awareness of the public and interested persons.

4. Information dissemination on existing genetic resources, development of management and information exchange systems

To ensure the availability of benefits from the use of genetic resources, it is first necessary to ensure open access to information concerning available genetic resources and their potential importance. In this connection, it is necessary to adjust the mechanism of information dissemination among a wide circle of interested persons at national and international levels.

At the national level, measures promoting the distribution of information can include holding seminars, issuing popular scientific publications on available genetic collections, demonstrating researches results.

Computerized databases and internet communication can ensure:
· Armenia has access to information on other collections;
· Others have access to information on Armenian collections.
It is expedient to concentrate the available information at the joint Center. On one hand, this can regulate access at the state level. On the other hand, this will help find partners for joint activities with the purpose of generating benefits from germplazm use.

Ongoing and proposed regional projects on information systems and databases creation can play an important role here, as pointed out in previous sections. Also, the ongoing project "Natural Resources Management and poverty reduction" can play a key role here.

5. Public awareness

Apart from scientific circles, the list of the stakeholders includes as well commercial users of genetic resources and others, as follows:

- **state scientific institutions owning germplazm collections, or conducting scientific activity on their study and use in the selection programs.** Scientific and educational institutions which play a main role in inventory and monitoring of biological resources, in scientific research and in the development of technologies based on the application of biological resources and traditional knowledge. The charters of these organizations allows

the exchange and sale of their genetic resources, with further investment of profit in activities addressing the conservation and replication of stored material. Each institution owning genetic resources, ex situ or in situ, has to develop standard agreements on the transfer of a material. Development and introduction of mechanisms of benefit sharing, particularly for protected areas is required;

- **the scientists – breeders using genetic resources in the selection programs as basic material**. The scientists can independently, as private persons, or by means of their scientific institutions, contact the national coordination center for advice and intermediary assistance in the purchasing of required initial material, or for the sale or exchange of the material on mutually advantageous conditions;
- **farmers and rural households who became land owners after land privatization.** As a rule, the private sector is badly informed related to mechanisms of possible income generation from the use of genetic resources and tries to solve problems independently by means of the market. Awareness raising among the rural population and the improvement of communications can facilitate the farmers access to necessary resources;
- **private sector - commercial organizations** using genetic resources for industrial purposes - pharmaceutical, perfumery, food, etc. The private sector and industry should help develop mechanisms on benefit sharing, such as joint ventures, and joint programs with local institutions (the owners of genetic resources);
- **the intermediaries** between the suppliers (selectors, farmers) and users. Intermediaries can support subjects interested in having access to genetic resources or in generating benefits. For example, intermediaries could be involved in negotiating and developing mutually agreed terms. Intermediaries may be commercial organizations, private persons or public organizations.
- **public organizations and NGOs.** These may create and maintain collections, gardens, nurseries and support ecotourism. A large number of NGOs are engaged in nature protection activities in Armenia. Their activities include conducting educational seminars on nature conservation, on landscape problems, on legal issues related to environmental protection, etc. These organizations may benefit from a better knowledge of modern approaches to benefit sharing from the use of genetic resources, as it could promote additional financial resources for investments in nature protection activities;
- **the local population, the local communities** with traditional knowledge of genetic resources and the related traditional technologies;
- **international agencies** (e.g. international research centers). The experience of cooperating with international agencies within the framework of regional projects demonstrates the opportunities for non- monetary benefit sharing from use of genetic resources. There are many factors conducive to international cooperation, including the presence of a rich plant and animal diversity, and a large number of economically important plants species in particular, the stable political environment, the absence of interference into research projects, skilled scientific staff.

Increasing awareness on preservation and use of genetic resources and public participation in development of mechanisms for decision making, needs periodical seminars at different levels, both for the scientists, and for policy makers.

Translation and distribution of appropriate documentation, preparation and publication of manuals on access and benefit sharing, addressed to a wide range of genetic resources

users and presenting the modern approach to this problem, possible monetary and not monetary samples of distribution of the profit from their use, typical samples of bi- and multilateral contracts etc.

6. Improvement of legislation

Key issues related to access to genetic resources (state regulation of both import and export of vegetative and animals species, protection of selection grades of cultural plants) are covered in the existing laws (Appendix 1). Amendments and changes to the existing laws « On flora » and « On fauna » would adjust coordination of activities on access to genetic resources and operational mechanisms of equal benefit sharing .

To ensure the implementation of the principles of access to genetic resources identified by national legislation and ratified in the country by the international agreements there is a need to develop by-laws that regulate access to genetic resources and benefit sharing, including administrative and monetary fees for the established norms infringements.

The intellectual property rights are closely bound with the problem of access to genetic resources and essentially impact all the issues, particularly benefit sharing. In this connection, it is extremely necessary for Armenia to prepare a draft law on intellectual property and to submit it to National Assembly.

With the aim of protecting the work and copyrights of breeders in the field of animal husbandry and it is necessary to prepare a law «On pedigree stock breeding».

The international voluntary guiding principles can serve as the instructions during development of the national legislation. The legislation should meet existing international obligations and be coordinated with them, including the international obligations on genetic resources for food and agriculture concluded under the aegis of FAO.

In order to implement the above-mentioned measures, it is necessary to attract the attention of international organizations financing related projects (such as GEF, WWF, IUCN etc.). This essential contribution can help develop a system of providing of access to genetic resources on mutually advantageous conditions, and can promote membership of the country in international networks on genetic resources. In 2000, Armenia became the full member of the European Cooperation Program (ECP), coordinated by IPGRI. Additional work will include finding sources of finance, success in developing the national policy, and adjusting the

mechanism providing access to and equal benefit sharing.

Annex 1

LEGISLATION ON ACCESS TO GENETIC RESOURCES

Law	Issues on access to genetic resources and benefit sharing
«On specially protected areas » (1991)	Adopted with the purpose of biodiversity conservation on the territory of reserves, national parks, nature monuments; permits use of genetic resources in the separate cases forecasted by law. Access to genetic resources is not permitted on the protected areas.
«Forest code» (1994)	Declared all the forest in the republic a state property, regulates relations on protection, conservation, replication and use of genetic resources, though the limits and terms of access are not identified.
«On flora» (1999) and "On Fauna" (2000)	Establishes rights and obligations of genetic resources users, including rights and obligations on possessing bioresources use and distribution of profit. They do not attract Issues on mechanism of access to genetic resources and fair sharing of benefit from their use . RA Government is authorized to confirm the list of flora and fauna for use, the charging their use. Illegal import and export of flora and fauna, acclimatization and illegal use in selection purposes.
«On plants protection and quarantine»	Regulates public relations in the field of plants and animals conservation and use, concerns plant diseases diagnostics and prevention issues, identified responsibilities of organizations on monitoring and maintenance of quarantine norms.
«On breeding achievements protection » (1999)	Regulates property and individual non-property relations on creating grades of cultivated plants, their legal protection and use, grants exclusive licensed rights for breeders- author of the grade to use the breeding achievements, forecast use of selection results by other persons with non commercial purposes, for testing and as an initial material for new grades generation.
RA Government decision (1996)	Grants permissions for industrial fishing within Sevan lake only to the persons and organizations with appropriate licenses.