Analysis of the State of Implementation of Georgia's first National Biodiversity Strategy and Action Plan

Synthesis of the situation analyses prepared for the purpose of elaborating the second National Biodiversity Strategy and Action Plan

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List of Abbreviations

ACIAR	Australian Centre for International Agricultural Research
APA	Agency of Protected Areas of Georgia
ASCI	Area of Special Conservation Interest
AUG	Agricultural University of Georgia
AWCC	Australian Winter Crop Gene bank
BC	Before Christ
BMU	German Federal Ministry for Environment, Nature Conservation and Nuclear Safety
BMZ	German Federal Ministry for Economic Cooperation and Development
BP	British Petroleum
BP/BTC	British Petroleum/Baku-Tbilisi-Ceyhan Pipeline
CACAARI	Central Asia and Caucasus Association of Agricultural Research Institutes
CBD	Convention on Biological Biodiversity
CCD	Community Collapse Disorder
CENN	Caucasus Environmental NGO Network
CEPF	Critical Ecosystem Partnership Fund
CGIAR	Consultative Group for International Agricultural Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLIMA	Centre for Legumes in Mediterranean Agriculture
CNF	Caucasus Nature Fund
CRDF	CRDF Global - an independent non-profit organization that promotes international scientific and technical collaboration through grants, technical resources, training and services.
CWR	Crop Wild Relatives
EC	European Commission
EU	European Union
FAO	Food and Agricultural Organization of the United Nations
FFI	Fauna & Flora International
GAAS	Georgian Academy of Agricultural Sciences
GCDT	Global Crop Diversity Trust
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft fuer Internationale Zusammenarbeit
GMO/LMO	Genetically Modified Organism/Living Modified Organism
GPAP	Georgian Protected Area Programme
GPS	Global Positioning System
GRDF	Georgian Research and Development Foundation
IBA	Important Bird Area
ICARDA	International Centre of Agricultural Research for Dry land Areas
IPA	Important Plant Area
IPK	Leibniz Institute of Plant Genetics and Crop Plant Research

ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for the Conservation of Nature
IUCN CCC	IUCN Caucasus Cooperation Centre
KBA	Key Biodiversity Area
KfW	Kreditanstalt für Wiederaufbau
LEPL	Legal entity of public law
MoA	Ministry of Agriculture of Georgia
MoEP	Ministry of Environment Protection of Georgia
NBSAP	National Biodiversity Strategy and Action Plan. The suffixes “1” and “2” denote Georgia’s first NBSAP, which was adopted in 2005, and Georgia’s second NBSAP, which was due to be adopted in the first quarter of 2013 at the time of printing this report.
NELE	Non-commercial legal entity
OSCE	Organization for Security and Cooperation in Europe
PA	Protected Area
PAL.CLASS	Habitat classification based on "*A classification of Palaearctic habitats*" 1995 version
PCT	Patent Cooperation Treaty
PGR	Plant Genetic Resources
PGRFA	Plant Genetic Resources for Food and Agriculture
POPs	United Nations Stockholm Convention on Persistent Organic Pollutants
RAPPAM	Rapid Assessment and Prioritisation of Protected Areas Management
REC Caucasus	Regional Environmental Centre for the Caucasus
TJS	Transboundary Joint Secretariat
UNDP	United Nations Development Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UPOV	International Union for the Protection of New Varieties of Plants
USDA	United States Department of Agriculture
USDoI/ITAP	International Technical Assistance Programme of the US Department of the Interior
WB	World Bank
WRB	World Reference Base for Soil Resources
WWF	Worldwide Fund for Nature

Units of measurement

asl	above sea level
km	kilometres
m	metres
ppm	parts per million
psu	Practical salinity unit
^{o}C	degrees centigrade

INTRODUCTION

Georgia and the Convention on Biological Diversity

In 1994 Georgia joined the Convention on Biological Diversity (CBD) and in so doing committed itself to the Convention's three objectives: the conservation of biological diversity; the sustainable use of its components; and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

In the Convention's first Strategic Plan, adopted in 2002, the Parties committed themselves "to a more effective and coherent implementation of the three objectives of the Convention, to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth."

The Convention's 2010 biodiversity target has not been achieved. The diversity of genes, species and ecosystems continues to decline, as the pressures on biodiversity remain constant or increase in intensity mainly, as a result of human actions. Scientific consensus projects a continuing loss of habitats and high rates of extinctions throughout this century if current trends persist, with the risk of drastic consequences to human societies as several thresholds or "tipping points" are crossed. Unless urgent action is taken to reverse current trends, a wide range of services derived from ecosystems, underpinned by biodiversity, could rapidly be lost. While the harshest impacts will fall on the poor, thereby undermining efforts to achieve the Millennium Development Goals, no-one will be immune from the impacts of the loss of biodiversity.

Halting and reversing these trends requires actions at multiple entry points, which are reflected in the goals of the Convention's Strategic Plan for Biodiversity 2011-2020. These include:

a) Initiating action to address the underlying causes of biodiversity loss;

b) Taking action now to decrease the direct pressures on biodiversity;

c) Continuing direct action to safeguard and, where necessary, restore biodiversity and ecosystem services;

d) Efforts to ensure the continued provision of ecosystem services and to ensure access to these services, especially for the poor who most directly depend on them;

e) Enhanced support mechanisms for capacity-building and the generation, use and sharing of knowledge, and access to the necessary financial and other resources.

The vision of the Convention's Strategic Plan is a world of "*Living in harmony with nature" where "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.*"

The mission of the Convention's Strategic Plan is to take effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication.

The Strategic Plan includes 20 targets (the "Aichi Biodiversity Targets") organized under five strategic goals. The goals and targets constitute aspirations for achievement at the global level, and a flexible framework for the establishment of national or regional targets.

Updating Georgia's National Biodiversity Strategy and Action Plan

Georgia adopted its first National Biodiversity Strategy and Action Plan. In 2011 the Ministry of Environment Protection (MoEP) took the first steps towards the preparation of an updated National Biodiversity Strategy and Action Plan to reflect the vision and mission of the Strategic Plan for Biodiversity and Aichi Targets.

The MoEP's Biodiversity Protection Service, with technical assistance from GIZ in the framework of the project *Sustainable Management of Biodiversity – South Caucasus*, commissioned a number of organisations to assess various aspects of the state of Georgia's biodiversity and the progress that the country had made with implementing its first National Biodiversity Strategy and Action Plan. The result was eleven thematic reports running to more than 1,000 pages. The themes were as follows:

1. Conservation of species and habitats
2. Protected areas
3. Agricultural biodiversity
4. Assessment and sustainable use of biological resources
5. Biosafety
6. Public participation and education
7. Biodiversity and climate change
8. Management and governance of biodiversity
9. Biodiversity of forests
10. Biodiversity of inland waters
11. Biodiversity of the Black Sea

The eleven reports were compiled into a single volume so that all of the information and conclusions provided by the assessments could be found in one document. Even after editing, the compilation runs to over 300 pages; therefore the Biodiversity Protection Service arranged for a synthesis - this document - to be prepared.

Document overview

This synthesis takes for its structure the headings of the thematic chapters of NBSAP-2, namely:

- Species and habitats
- Protected areas
- Forest ecosystems
- Agricultural biodiversity and natural grasslands
- Freshwater ecosystems
- The Black Sea
- Cross-cutting issues and governance
- Communication, education and public awareness

The thematic chapters are prefaced by an overview of the importance and present condition of Georgia's biodiversity. Each chapter – or each subchapter in the case of the chapter *Cross-cutting issues and governance* is structured as follows:

- a description of the key problem or problems;
- a description of the action which Georgia has taken in the framework of the first National Biodiversity Strategy and Action Plan (NBSAP-1);
- a discussion of issues drawn from the eleven thematic reports that are relevant for the updated National Biodiversity Strategy and Action Plan (NBSAP-2).

GEORGIA'S BIODIVERSITY

The importance of Georgia's biodiversity

Georgia lies in the Caucasus, one of the Earth's biologically richest regions. It is one of WWF's 35 "priority places" and one of 34 "biodiversity hotspots" identified by Conservation International as being the richest and at the same time most threatened reservoirs of plant and animal life. The Red List of Georgia contains 134 animal species and 56 plant species; 42 of the animal species and 18 of

the plant species are categorised as endangered or critically endangered; many of the animal species in the list are globally threatened.

Georgia's biodiversity underpins ecosystem functioning and the provision of ecosystem services essential for human well-being. It includes the ecosystems and habitats which harbour animals and plants that are used for food and other purposes and which provide life-sustaining services: forests provide timber, protect the quality of water supplies, help prevent erosion and landslides, mitigate the impact of landslides, and help to regulate the global carbon cycle; Georgia's summer and winter pastures provide food for cattle and sheep, medicinal and culinary herbs, and support a traditional way of life that has existed for hundreds of years; Georgia's wetlands and lakes provide stop-overs for birds on their long annual migrations across continents; the Black Sea sustains fish stocks and stores carbon dioxide and methane; Georgia's mountains hold glaciers which regulate the flow of water into the country's river system that provide water for homes and agriculture.

The condition of Georgia's biodiversity

It is not possible to provide a precise account of what is happening to Georgia's biodiversity: information on the condition of ecosystems, habitats and species has not been collected in a systematic way and the biodiversity monitoring system developed by the MoEP has been installed only recently. Information from Georgia's national reports to the Convention on Biological Diversity and from studies prepared in the frame of various projects present the following picture:

Plant and animal species under pressure

152 endemic plant species - approximately 60% of the total number of Georgian endemics - are classed as endangered. Conversion of natural and semi-natural habitats and more intensive agricultural methods are resulting in the destruction and transformation of the habitats of invertebrates. Out of fish species all six species of sturgeon found in Georgia's coastal waters and river deltas (*Acipenser sturio, A. stellatus, A. gueldenstaedti, A. nudiventris, A. persicus, Huso huso*) are included in the Red List of Georgia. *Acipenser sturio* is included in the IUCN Red-List with the status Critically Endangered. During the last ten years habitats of the amphibian the Caucasus salamander (*Mertensiella caucasica*) and the reptile the Caucasus viper (*Vipera kaznakovi*) have gradually declined as a result of human activities: the viper's habitat has become fragmented due to the decline of mountain forests and the species is classified in the IUCN Red List as endangered. In recent years the Caucasus frog (*Rana macrochemis*) has been collected intensively on the Kolkheti plain and exported from Georgia.

35 bird species are included in Georgia's Red-List. Among birds of prey the most threatened species is the eastern imperial eagle (*Aquila heliaca*): this bird has only 15 nesting areas in Georgia. The black vulture (*Aegipius monachus*) is one of the rarest vultures not only in Georgia, but also worldwide. The black stork (*Ciconia nigra*) exists only in small numbers in Georgia.

Out of small mammals the endemic rodents Brandt's hamster (*Mesocricetus brandti*) and long-clawed mole vole (*Prometheomys schaposchnikovi* Satunin) are rare species with very limited and fragmented habitats due to grazing and agriculture and intensive use of agro-chemicals. There is a declining trend of bat populations in Georgia due to habitat degradation and nuisance near to sheltering areas.

Illegal and unsustainable hunting is the main cause of decreases in populations of large mammals including red deer (*Cervus elaphus*), eastern and western tur (*Capra cylindricornis, Capra caucasica*), chamois (*Rupicapra rupicapra*), wild goat (*Capra aegagrus*), wild boar (*Sus scrofa*) and brown bear (*Ursus arctos*). Today, only three small populations of red deer remain and these are all found in existing protected areas. The numbers of tur, chamois, wild goat and brown bear populations have all decreased whilst the goitered gazelle (*Gazella subgutturosa*) has become entirely extinct in the country. Poaching also poses a threat to the country's populations of water birds, many of which are popular targets for hunters.

Plant and animal varieties important for agriculture under pressure

The crops cultivated in Georgia since ancient times (endemic species and landraces) and their wild relatives (as possible sources of the domestication of landraces) are of the highest conservation importance. Among fruit crops are grape and its wild relative species (*Vitis vinifera* subsp. *sylvestris*) and *Malus*, *Pyrus*, *Prunus* and *Corylus*. As for field crops, wheat (including five endemic cultural species, a wide range of landraces and seven species of wild relatives), barley and other grain and legume crops have the highest conservation value.

Natural populations of many species of crop wild relatives (CWRs) are increasingly at risk. The primary causes of diversity loss of wild plant species are habitat loss, degradation and fragmentation. Many CWRs of cereals, including relatives of wheat and millet, which occur on arid or semi-arid lands, are severely affected by over-grazing and desertification. Forest species are affected by habitat disturbance due to illegal forest cutting. Climate change is having significant impacts on habitats and the distribution of species. One of the most serious threats to the diversity of CWRs is genetic erosion and pollution (including the threat of genetic pollution by GMOs).

One of the problems for the conservation of medicinal plants is overharvesting, mainly for commercial purposes when a species is collected for the pharmaceutical industry in large amounts. Such harvesting can lead to the extinction of populations. Medicinal plants such as *Origanum vulgare*, *Helichrysum plicatum* and *Hypericum spp*., which were once very widespread in the country, are endangered.

The majority of local landraces and breeds of domestic animals are at risk of extinction due to their uncontrolled crossing with introduced breeds. The number of preserved pure-bred animals is rather small. Some strains of the Georgian mountain cattle landrace have been completely lost (Abkhazuri and Osuri), while others (e.g. Acharuli) have dramatically declined in number. Some Georgian sheep breeds are declining in purity (Tushuri, Imeruli) as a result of cross-breeding. The Kakhuri, Svanuri and Rachuli pig breeds and the Tushuri horse are in decline. The Megruli horse is at risk of complete extinction. The Georgian bee is threatened with genetic erosion.

Critical ecosystems and habitats are being degraded and fragmented

Forests are under pressure from unsustainable logging and overgrazing and poor management practices. A large part of the forest fund is severely degraded. In some places degradation has led to the complete loss of forest cover and the plant and animal communities that depend on it, with the result that the forest fund is becoming fragmented and its ability to provide life-supporting ecosystem services is being reduced.

Intensive grazing in the alpine zones of the Eastern Caucasus has resulted in a decrease in the feeding base and habitat quality of wild ungulates (hunting may be a more significant factor) particularly for the chamois, east Caucasian tur and red deer. The subsequent decrease in the number of wild ungulate numbers is probably one of the main causes of current conflicts between large carnivore species, such as the wolf, and local communities.

In Georgia's semi-arid ecosystems, used as winter pastures for sheep, overgrazing is especially intense causing severe erosion. The problem is now critical and without urgent restoration activities may soon become irreversible in some places. This particular form of habitat degradation, started in the Soviet period, has resulted in a dramatic reduction in the availability of natural grazing and, in conjunction with hunting, has already led to the local extinction of the red deer and goitered gazelle.

Water ecosystems in Georgia have been intensively modified over the years as bogs have been drained and water levels in many lakes have been artificially regulated. Pollution from chemicals used in agriculture and discharge of industrial waste and human waste pollute internal waters and the Black Sea. Since 1995 pollution from non-industrial sources due to abandonment of water treatment facilities has increased and none of these facilities are functioning at present. Monitoring of water quality has been conducted only for 22 of the country's rivers and one lake, Paliastomi. It is

generally recognised that pollution now threatens many of the species associated with Georgia's wetlands. Pollution by organic substances is causing eutrophication of the Black Sea, resulting in "dead zones". Overfishing is putting pressure on fish stocks in reservoirs and the Black Sea and reducing food supplies for animals higher up the food chain such as the Black Sea dolphin. Harmful fishing methods such as bottom trawling and the use of nets with small mesh sizes is causing serious damage to the Black Sea's ecosystem.

Invasive alien species are threatening terrestrial and aquatic ecosystems. Habitats important for biodiversity are being lost to construction projects, including hydro-electricity generation infrastructure, electricity transmission lines, new roads and railways and industrial and urban development.

Climate change

The pressures on biodiversity are compounded by the impacts of climate change. The vast majority of experts agree that the planet is becoming warmer as a result of increased concentrations of carbon dioxide and methane in the atmosphere from the burning of fossil fuels, deforestation and animal husbandry. The higher temperatures, and the decreased levels of precipitation that are predicted for some parts of Georgia, will put ecosystems – especially those which are at the margins of their natural range – under severe stress. Plant communities, and animal populations that depend on them, will change their distribution and some may disappear from Georgia because they are not able to move quickly enough or adapt to the changed climate.

Underlying causes and enabling factors

Biodiversity loss has a number of underlying causes, the effects of which are facilitated by several enabling factors.

The main underlying causes of the pressures on biodiversity are:

- the poverty of many, who are driven to use natural resources unsustainably for energy, food and financial gain;
- the greed and irresponsibility of a few who take and spoil without regard for the impact of their actions;
- ignorance about the importance of biodiversity and the impacts of people's own actions on biodiversity;
- the country's drive for economic development, which is essential for raising people out of poverty.

The main enabling factors are the following:

- lack of awareness of the importance of biodiversity and of what individuals and businesses can do to reduce the pressures on biodiversity;
- insufficient regard paid to the value of biodiversity in policies, strategies and programmes
- inadequate and in some cases perverse laws regulating the use of biological resources
- lack of resources to enforce regulations and implement procedures that are designed to safeguard biodiversity

SYNTHESIS OF THE SITUATION ANALYSES

Species and habitats

Description of the problem in NBSAP-1

NBSAP-1 summarised the problems related to species and habitats in the following way:

- The current status of most species is unknown; this makes it difficult to plan and prioritise conservation activities and ensure the sustainable use of resources.
- The Georgian Red Data Book is out of date;
- Many species of animals are critically endangered;
- Many species of plants are critically endangered (including endemic and relict species);
- Existing botanical gardens cannot undertake conservation activities and there are no captive breeding centres for threatened native animal species;
- Quotas have not been established for economically important plant and non-game animal species;
- Many rare and relict plant communities are threatened;
- Habitats such as semi-deserts, steppes, wetlands, flood plain forests and Colchic forests are endangered;
- Primary, globally important and sensitive plant communities have not been identified and assessed;
- Overexploitation of pasturelands has resulted in the degradation of plant communities and soils both in winter and summer pastures, in some cases leading to permanent damage;
- There is limited information on important areas for biodiversity outside protected areas, and such areas are not managed sustainably;
- There is no information on the impact of alien species on ecosystems.

Action taken and progress made since the adoption of NBSAP-1

- ***Red list***

The National Commission on Endangered Species has been established under the auspices of the Georgia Academy of Science.

The status of rare plant and animal species has been assessed in accordance with IUCN categories and the results incorporated in the new Red List of Georgia in 2005; the list consists of 197 species, of which 141 are animal species and 56 are plant species. In addition the Caucasus plants “Red List” has been elaborated.

The distribution and the conservation status of endemic plant species of the Caucasus Ecoregion has been assessed in the framework of the project “Coordination and Development of Plant Red list Assessments for the Caucasus Biodiversity Hotspot”. The assessment resulted in the first comprehensive list of plants endemic to the Caucasus region (about 2,950 species/subspecies) with Red List assessments for about 1,200 taxa. Assessments of about 800 taxa were submitted to the IUCN Red List unit.

- ***Conservation of threatened plant species***

Information on endemic species assessed for inclusion in the “Red List of the Caucasus Endemic Plant Species” has been used to identify Important Plant Areas (IPAs) in Georgia. Among Georgian endemic

plants about 20% are calciphylic lithophytes found on the Kolkheti limestone ranges (Gagra, Bziph, Egrisi, Askhi, Okriba, Khvamli and Racha ranges up to the Rikoti pass). About 80% of local endemics associated with limestone habitats are classified as endangered due to overgrazing, infrastructure development, tourism and recreation and climate change. First efforts on the identification of IPAs are based on existing data on endangered endemic species, 40% of which are associated with limestone habitats. GIS analysis of the distribution of calciphylic endemic plants has made it possible to identify IPAs on limestone ranges; this information provides supportive arguments for carrying out in-situ conservation measures in Abkhazia, Samegrelo and Racha-Lechkhumi.

At present protected areas represent virtually the only effective means of in-situ conservation of endangered species. Ex-situ conservation is implemented in Georgia's botanical gardens (Tbilisi, Batumi, Sokhumi, Kutaisi and Bakuriani) and partially in Tsinandali, Likani, Georgian Youth Palace and Zugdidi dendrological parks. Georgia's botanical gardens collaborate with the international organization Botanical Gardens Conservation International (BGCI). A seed bank has been created in Batumi Botanical garden to carry out ex-situ conservation of endemic species.

Collection and export quotas for the plant species subject to international trade have been determined.

- ***Conservation of threatened animal species***

Conservation action plans for some of Georgia's most critically threatened species have been developed and implementation of some of the plans has started. Conservation plans for both species of the Carpinae family – the eastern and western tur (*Capra caucasica, Capra cylindricornis*) – have been elaborated. A conservation plan for leopard (*Panthera pardus*) was prepared in 2010 and the implementation of its individual components has been initiated. Conservation plans have also been prepared for the following: bats; Caucasus salamander (*Mertensiella caucasica*); brown bear (*Ursus arctos*) in the Surami range; lesser white-fronted goose (*Anser erythropus*); white-headed duck (*Oxyura leucocephala*); eastern imperial eagle (*Aquila heliaca*); lesser kestrel (*Falco naumanni*); red-breasted goose (*Branta ruficollis*).

Captive breeding of goitered gazelle in Vashlovani Protected Areas was started in 2009. A national plan for reintroducing the species into the wild in Georgia was developed in 2012.

- ***Conservation of habitats critical for threatened species***

Some "hot spots" have been identified in the framework of the joint CoE / EU "Programme for the development of the Emerald Network in Central and Eastern Europe and the South Caucasus". However, in Georgia most of the identified hotspots are inside existing PAs.

Up to now no strategies or action plans have been developed for the conservation and sustainable use of hotspots outside PAs.

Issues for NBSAP-2

- ***Up-to-date and comprehensive list of threatened species***

The creation of a new Red List for Georgia in 2006 was a major development. However, a country-wide assessment and monitoring of various taxa and particularly Georgian fauna has not been carried out since the break-up of the Soviet Union and the information which was used to determine the conservation status of Red List species is outdated. At present updated information is available only for several taxa; the current status of some species and in particular of large mammals needs to be reviewed and upgraded. Many in Georgia's scientific community think that the present Red List needs review and the status of some species may be changed as a result of this exercise.

- ***Species action plans***

National conservation plans have been elaborated for numerous species; some of these programmes are being implemented and should be continued in the future. It is important to develop conservation plans for other threatened species and in case of necessity to initiate captive breeding programmes for them.

The list of species for which conservation plans need to be prepared should be reviewed taking into account the most up-to-date information available about a species' conservation status in the country.

Certain species of large mammals require specific urgent conservation measures, in particular those species which have very small populations (e.g. red deer, leopard and bezoar goat). In addition, urgent measures should be carried out to restore those species that have become extinct in the near past, including the goitered gazelle.

The captive breeding programmes for the bezoar goat and the goitered gazelle have been on-going in Georgia for some years. Unfortunately the planned increase in the number of individuals has not been achieved so far. At this stage the only successful programme is the breeding programme for common Pheasant (*Phasianus colchicus*). It is necessary to better plan breeding programmes, expand them and develop specific conservation plans.

There are legal impediments to implementing species conservation plans: more specifically none of the species conservation plans has a legal status; the species conservation plans prepared in recent years have been only endorsed by the relevant state agency – the MoEP.

- ***Monitoring of species***

An urgent task is to monitor large mammals, in particular Red List species.

- ***Hunting***

The normative framework for sport and amateur fishing, and falconry is inadequate. There is no community-oriented and/or trophy hunting concept; there is no provision for the reproduction of hunting and fishing species; hunting farms have failed to develop because of the impunity of poachers. Outside protected areas not a single agency is in charge of fighting against poaching (illegal hunting, fishing). There are no hunting rules or means to enforce hunting rules. Ineffective management of game hunting has led to a drastic drop in the number of game populations. There has been no progress in this regard and no conservation measures have been implemented for the conservation of game species.

- ***Habitats***

Further studies need to be carried out to identify all hot spots outside PAs.

Strategies and action plans need to be developed for the conservation and sustainable use of hotspots outside PAs.

Protected Areas

Description of the problem in NBSAP-1

NBSAP-1 summarised the problems related to protected areas in the following way:

- Degradation of natural and cultural landscapes are resulting in a reduction of biodiversity;
- Georgia lacks an integrated protected areas system;
- Many important biodiversity sites are not included in the protected areas system (Central Caucasus, Javakheti Plateau);

- There are few sites in Georgia with an international protection designation (e.g. Biosphere Reserve);
- There is a lack of international cooperation to support protected areas of Georgia;
- Some reserves are too small to be viable;
- There is a lack of regular monitoring of protected areas;
- Local communities have limited environmental awareness and lack of knowledge of current activities in protected areas;
- There are conflicts of interest between protected areas and local communities;
- Illegal use of natural resources takes place within protected areas; and
- Regulations controlling the management of protected areas are not adequate.

Action taken and progress made since the adoption of NBSAP-1

- ***New protected areas***

Since 2005 Georgia has established Mtirala and Machakehla National Parks, Javakheti Protected Areas (which includes Javakheti National Park and 5 managed reserves) and 21 natural monuments. As a result the area of protected areas has been increased from 431,028.98 ha (6.16% of Georgia's territory) to 519,053.75 ha (7,42% of Georgia's territory).

- ***Planning the further development of the PA network***

A draft strategy and action plan for the further development of the protected area network was prepared in 2010, though it was not formally adopted. In 2009-2011, within the framework of the joint Council of Europe and EU Programme for the development of the Emerald Network in Central and Eastern Europe and the South Caucasus, a scientific database and maps were prepared and 20 sites of special conservation interest (ASCI) with a total area of 596,475.63 ha were identified. The majority of sites coincided with existing protected areas. In 2011-2012 a multi-stakeholder group of experts reviewed, updated and published the Caucasus Ecoregion Conservation Plan, which provides a blueprint for a network of protected areas and linking corridors for the entire Caucasus ecoregion.

- ***Protected areas management effectiveness***

There have been significant improvements in protected area management effectiveness. The MoEP adopted new regulations on the content of, and process for elaborating, protected area management plans in line with international best practice. **Management plans** for four protected areas have been prepared in accordance with the guidelines; one of them has been formally approved. **Infrastructure** of many protected areas has significantly improved since 2005. Many protected areas have well established visitor centre with exhibition halls providing information on protected areas. The Agency for Protected Areas (APA) and its territorial administrations arranges various programmes for visitors including tours, activities, eco-camps and festivals. The programmes are developed for different target and age groups. Interpretation desks installed on touristic trails in protected areas provide specific information to visitors. **Tourism** infrastructure and tourist services have been significantly improved in a number of protected areas; since 2005 number of tourists in protected areas has increased 50-fold.

Some progress has been made in **involving local communities** in planning and managing protected areas. The commissions established by the MoEP to prepare proposals for new protected areas include consultations with local communities; the external boundaries and zonation of the new Javakheti Protected Areas were planned with the full involvement of local communities, whose representatives participated in the various working groups set up by the planning team. The regulations governing the structure and process of preparing protected area management plans include participation by local communities as an essential part of the process; all management plans

prepared since the guidelines were promulgated were elaborated with the participation of representatives of the local population.

Significant steps have been taken in bilateral **cross-border cooperation** between Georgian and the other countries of the southern Caucasus. The MoEP has signed a formal agreement with the Ministry of Environment and Forestry of Turkey to develop cross-border cooperation between protected areas in western Georgia and eastern Turkey. The Agency of Protected Areas of Georgia and Ministry of Ecology and Natural Resources of Azerbaijan are developing cooperation between Lagodekhi PAs and Zakatala State Nature Reserve with the support of the Transboundary Joint Secretariat for the Southern Caucasus (TJS).

Progress has been made with **filling the financing gap** for Georgia's protected areas and with putting financing on a more sustainable footing. The Caucasus Nature Fund (CNF), which began operations in Georgia in 2008, co-financed the running costs of four PAs in 2012. The CNF plans, together with the APA, is planning to increase steadily the number of supported protected areas over the next five years. The UNDP/GEF project "Catalysing Financial Sustainability of Georgia's Protected Areas" achieved changes in legislation that allow payments to protected areas by visitors to be retained and reinvested in the PA network and piloted new ways of capturing income from visitors to Tusheti Protected Areas.

Issues for NBSAP-2

- ***Interpretation of the Aichi Target for protected areas***

Aichi Target 11 states: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

According to the CBD Secretariat's guidance several conditions need to be met in order to achieve the target: The area conserved should:

> **Increase** – Globally, this should be to 17% for terrestrial (including inland water) areas and 10% for marine areas. National targets may vary from this;
>
> **Include areas of particular importance for biodiversity and ecosystem services**, such as areas high in species richness or threatened species, threatened biomes and habitats, areas with particularly important habitats (key biodiversity areas, high conservation value areas, important plant areas, sensitive marine areas etc.) and areas which are important for the continued provision of ecosystem services (such as areas important for water supply, erosion control, sacred sites, etc);
>
> **Be ecologically representative** – Protected area systems should contain adequate samples of the full range of existing ecosystems and ecological processes, including at least 10% of each ecoregion within the country;
>
> **Be effectively and equitably managed** with planning measures in place to ensure ecological integrity and the protection of species, habitats and ecosystem processes, with the full participation of indigenous and local communities, and such that costs and benefits of the areas are fairly shared.
>
> **Be well-connected to the wider landscape or seascape** using corridors and ecological networks to allow connectivity, adaptation to climate change, and the application of the ecosystem approach.

- ***Extent, representativeness and connectivity of Georgia's protected area network***

The increase since 2005 in the area that is protected for biodiversity conservation is to be welcomed but there are still some critical gaps, in particular in the central Caucasus mountain range (the regions of Svaneti, Raja, Lechkhumi and Khevsureti). Furthermore, Georgia's protected areas do not form the type of network which Aichi Target 11 envisages, i.e. well-connected systems of protected areas integrated into broader landscapes.

Achievement of the Aichi target faces the problem that Georgia's development strategy has increasingly prioritised economic development over the conservation and sustainable use of biodiversity. At the time of this situation analysis in 2012 there was less overall political support for completing a fully representative protected area network; cross-sectoral cooperation existed but with the proponents of protected areas in a weakened position. There are indications of increased pressures on the protected areas because of economic developments. In Kolkheti National Park part of a Ramsar site was allotted for construction of the Kulevi terminal; part of Kazbegi National Park was allocated for the construction of a hydro-electric power station; part of Borjomi-Kharagauli National Park was allocated for a high voltage transmission line.

Expansion of the protected areas network is hindered by the lack of a vision for the network, while there is a clear vision for economic development. The "competition" between biodiversity conservation and economic development in government policy needs to be eased: there is enough space for both. An important step forward would be the adoption of a **spatial plan for the development of Georgia's protected area network**. A lot of work has been carried out and reports prepared that could support such planning; in particular, in the Caucasus Ecoregion Conservation Plan there already exists a strong basis for elaborating a vision for a future protected areas network.

The progress that has been made in bilateral cross-border cooperation on biodiversity conservation between Georgian and the other countries of the southern Caucasus is significant but more needs to be done to establish **transboundary connectivity** between Georgia's developing network of protected area and protected area networks in Armenia, Azerbaijan, Russia, Turkey and Iran.

- ***Management effectiveness of Georgia's protected areas***

There are weaknesses related to the **design of protected areas**. Legislation - in particular legislation related to establishment and management of protected areas of IUCN categories V and VI, and Biosphere Reserves - is deficient. This problem is closely related to the establishment and management of buffer/support zones: only a two protected areas in Georgia have legally established and functioning buffer zones. Also, improvements need to be made to legislation related to natural monuments and managed reserves (e.g. permission for hunting on the territory of natural monuments seems to be an obvious misunderstanding). There is deficient legislation in terms of allocation of some protected area lands for different uses, and the laws fail to define adequate compensation mechanisms.

The appropriateness of the regulation on **management planning** is still under debate by various national and international institutions. Revision of the regulation is needed (and is planned). Most protected areas still do not have management plans. The APA and its territorial administrations still lack capacity in PA management planning and are overly dependent on international consultants and donor financing.

Protected area administrations lack capacity to elaborate **habitat and species conservation programmes** and other management programmes and the means to implement them. There are few species reintroduction activities, and they are limited in scope (especially fauna re-introduction). There are particular problems with ensuring sustainable pasture management and sustainable forest management in traditional use zones. None of the protected areas in which agricultural activities are allowed has a management plan that regulates agricultural activities and/or agricultural biodiversity conservation and rational use in these protected area categories. Management plans do not specify

any programmes of allowed activities or action plans, which actually limits the rights of the local communities in adjacent areas for traditional resource use. This fact also limits some functional uses of the protected areas, such as traditional farming and crafts to maintain unique local historical and cultural environment and stimulate income-generation activities that would ensure sustainable agriculture and resource use. There are not sufficient **educational and awareness-raising programmes** and activities dedicated to protected area relevance and functioning, especially community-oriented **research and monitoring** systems are not adequate; there is no unified database and regular evaluation of protected area management effectiveness is not conducted. **Climate change** is not factored into PA management plans. In most of the protected areas there is still a **lack of adequate infrastructure and equipment** and there is a general **lack of qualified personnel**.

- ***Stakeholder participation in the management of Georgia's protected areas***

More needs to be done to ensure full participation of interested local parties in protected areas management. Some barriers exist in legislation: the Law on the System of Protected Areas gives the right but not an obligation to the APA to cooperate with the local population in making divisions on protected area establishment, changes in the category and territory of a protected area, management planning, and consideration and amendment of administrative acts and other documents. Yet the Law on the System of Protected Areas does not define respective cooperation mechanisms. Additionally, local community representatives are not represented in protected areas' Scientific-Advisory Councils. Some progress has been made in involving local communities in planning and managing protected areas. The regulations governing the structure and process of preparing PA management plans include participation by local communities as an essential part of the process. The challenge now is to transfer the obligation in the regulation into practice on the ground.

Livelihood benefits flow to local people from Georgia's national parks and other categories of protected area in which natural resource use is allowed; examples are income from providing services to visitors, income from animals grazed on pastures, and wood for heating and cooking. In these ways local people are responsible for protected areas but they have no authority to manage the resources which they use. Co-management or devolution of management of some of the resources of protected areas could help to strengthen relationships between protected area administrations and local people and could be more cost-efficient.

- ***Financing of Georgia's protected areas***

State budget spending for protected areas has increased in recent years; however, almost all components of the PA management structure and functioning are under-financed, including salaries and operational costs as well as costs for additional research, monitoring and educational activities, this being one of the major causes of the above-listed problems and obstacles.

Establishment of the Agency of Protected Areas as a legal entity of public law in 2008 facilitated additional fund raising, namely from entry fees to national parks and as from concessions. In 2012 APA's revenues made up about 12-13 per cent of its annual budget. Current legislation does not significantly restrict protected areas in terms of diversification of funding sources and implementation of effective revenue mechanisms; however, the legislation should be improved to enhance financial sustainability of the protected areas by giving a clear definition of PA funding diversification and mechanisms and opportunities of additional revenues for APA

The gap between the funding needs of the PA network and actual funding is still substantial and more steps need to be taken to close the gap. At present about 50 per cent of funding comes from donors; a large proportion of donor funding is in the framework of short term projects which create new protected area assets that generate additional running costs. The support of the CNF will continue to be needed for many years to come. The UNDP/GEF project "Catalysing Financial Sustainability of Georgia's Protected Areas" developed a ten-year investment plan for 2012–2022

that should assist APA with the identification and attraction of necessary investments in protected areas.

Forest ecosystems

Description of the problem in NBSAP-1

NBSAP-1 summarised the problems related to forest ecosystems in the following way:

- The current decline in forest area and quality is causing negative ecological and economic impacts;
- There is a lack of institutional structures, appropriate legalisation and financial resources to ensure the sustainable use of forest resources;
- Current levels of illegal logging and unsustainable forest exploitation is causing irreversible degradation of forest ecosystems;
- The low price of timber grown in Georgia's forests compared to international market prices results in the unsustainable exploitation of forests in Georgia;
- Lack of funding is preventing the sustainable development of the forestry sector;
- Current forestry practices do not take into consideration principles of biodiversity conservation;
- Forests are primarily assessed for their monetary value rather than their conservation status;
- The system of forest classification to regulate exploitation does not take into account dynamics of the ecosystem.

Action taken and progress made since the adoption of NBSAP-1

- ***High conservation value forests***

NBSAP-1 included the objective of establishing a moratorium on timber extraction from old growth forests and "high conservation value forests" (HCVF) and to use the priority principle with respect to these forests. Although some legal provisions on HCVFs exist no detailed management prescriptions (including restrictions of logging in ecologically sensitive areas) have been elaborated and implemented. NBSAP-1 also included the activity of preparing a national programme for the conservation of flood plain forests. No steps have been taken so far.

- ***Policy and legislation***

Some progress was made with elaborating a national forest policy; however the drafts that were prepared were not adopted by the government or the parliament. Progress was also made with elaborating a new Forest Code; however the draft that has been prepared requires substantial further work and should be subjected to wider public consultation. Efforts have also been made to adopt a new set of forestry regulations and standards that would address biodiversity-related concerns; however, no major progress has been made so far.

- ***Forest certification***

Efforts have been made to establish voluntary forest certification. A draft of a national sustainable forest management standard (with principles, criteria, indicators and verifiers) has been prepared for Georgia by a group of experts. The standard is based on the Forest Stewardship Council (FSC)'s principles and criteria and addresses the needs of biodiversity conservation; it was prepared by a group of experts coordinated by WWF-CauPO and supported GIZ; however, no further steps have been made towards forest certification. The standard needs to be endorsed by FSC; in order to promote voluntary forest certification, it is important to formally establish a National Initiative; there is a good scope for cooperation with neighbouring countries in this issue.

- ***Community forest management***

Steps have been taken in the framework of an EU-funded regional project to pilot community forest management. However, establishing community and communal (municipal) forest management systems faces legal and technical problems. Although the Forest Code states that the Local Forest Fund shall be managed by local self-governing bodies the boundaries of the Local Forest Fund have not been drawn and the transfer of forests to local self-governing authorities has not taken place; furthermore, local self-governing bodies are not ready to take over the responsibility for forest management, mainly because they lack funding, capacity and experience. Most of the potential Local Forest Fund consists of former collective farm forests located near population centres. These forests are degraded and their wood resources are very limited.

- ***Restoration of degraded forests***

In August 2010, the Georgian Government adopted a resolution "on Maintenance and Restoration of Forests", in which it is stated that forest restoration and afforestation should be conducted in line with the requirements of biodiversity conservation. In addition, according to the resolution, preference should be given to native, site-adapted species, which, undoubtedly, is a step forward. In 2010 WWF Caucasus published guidelines on forest restoration and in 2011 guidelines on the development of strategies for responding to the impacts of climate change on forest in the southern Caucasus[1].

In terms of action on the ground only a few reforestation projects have been implemented. In recent years, the state forest authorities have not been able to conduct forest restoration due to the lack of funding. A few projects aimed at the restoration of natural forest landscapes have been implemented by WWF, GIZ, REC-Caucasus and other organizations on a pilot basis; the total area restored is just a few hundred hectares.

Issues for NBSAP-2

The overall picture is that Georgia's forests are still being degraded by overgrazing and unsustainable logging. A significant part of the forest fund has been degraded to the point that it is no longer recognisable as forest. Flood plain forests - important refugia for biodiversity - are under serious threat and chestnut forests are under pressure from so-called sanitary felling.

- ***Unsustainable and illegal forest use***

Illegal logging has declined significantly in recent years but remains at unacceptable levels. Officially, the total volume of illegal logging was reduced to 7,339 m3 in 2011; however the true figure is in the order of hundreds of thousands per year. The actual volumes of logging substantially exceed the levels of natural growth capacity of forests located near population centres. As a result, these forests are devastated - the canopy cover has reached critically low thresholds (less than 50%) in more than 55% of forest area.

The main causes of unsustainable and illegal logging are rural poverty and a lack of affordable alternative energy resources. Lack of awareness among the loggers and consumers further aggravate the problem. Limited capacities of the state forestry authorities and legislative gaps prevent monitoring, control and proper law enforcement. In case of commercial timber, apart from institutional weaknesses, the major underlying causes are domestic and foreign market demands.

The collection of non-wood forest products (e.g. bulbs of snowdrops (Galanthus spp.) and cyclamens (Cyclamen vernum) continues to be an important activity. Official data on the volumes of some of

[1] Zazanashvili, N., Gavashelishvili, L., Montalvo, C., Beruchashvili, G., Heidelberg, A., Neuner, J., Schulzke, R., Garforth, M. (2011) Strategic Guidelines for Responding to Impacts of Global Climate Change on Forests in the Southern Caucasus (Armenia, Azerbaijan, Georgia). WWF, Tbilisi.

these resources licensed for harvesting is available. However, the real volumes of collection of these products are unknown. Consequently, it is very difficult to assess the sustainability of their use.

There are problems with respect to the collection of other non-wood forest products such as fruits, berries and mushrooms. Existing forest legislation allows collection of these products free of charge for personal consumption. No thresholds have been specified beyond which the collection of these products would be regarded as commercial, while many rural dwellers collect and sell them for gaining some cash. Because no annual quotas are defined, there might be significant risks of unsustainable extraction.

- ***Forest management practices***

Unsustainable forest management practices are still being used. The basis for felling operations of licensees in Georgia is the so called forest use (exploitation) plan. The template of this document applies inter alia to forest protection measures and reforestation as well as to biodiversity and environment protection measures, which forest users have to follow. Often the decision on the trees to be felled and method of felling is made by people that do not have adequate training. Control of felling operations is carried out with a focus on the correct felling of marked trees; biodiversity factors (e.g. deadwood, damages on regeneration, etc.) are given less consideration.

Forest roads are vital for sustainable use of forest, but they can also be a source of negative impacts on biodiversity by disturbing habitats of wild animals. Unfortunately forest roads in Georgia often are constructed without considering possible impacts on the protection function of forests and biodiversity. Management directives for forest roads considering biodiversity as well as health and safety norms for the workers should be developed. Inside the cutting areas the use of heavy log haulers often damages the forest soil and negatively impacts soil fauna and flora.

Unsustainable forest management practices are facilitated by inadequate license conditions for private companies and the lack forest management standards. Elaboration and adoption of sustainability-based forestry legislation, standards (both mandatory and voluntary) and guidelines designed to safeguard biodiversity conservation remain a priority. Further steps that need to be taken with regard to licensing of forest use are clearer specification of the rights and responsibilities of the license holders; adopting and implementing advanced forestry regulations and standards; to adopt new regulations on forest use fees, taking into consideration the interests of all stakeholders. Forest certification may also help to improve the standard of forest management but it will require the voluntary participation of licence holders and they unlikely to be willing to pay for certification unless it will enable them to sell their products at a higher price.

Over-grazing by livestock (cattle, sheep, goats and pigs) is still a serious problem in Georgia. In certain locations (near population centers, in winter pastures, etc.), because of the excessive number of livestock, grazing is often shifted to nearby forests. Excessive grazing can cause severe damages to forest ecosystems. Major causes of this problem are rural poverty and a lack of alternative livelihood opportunities. Lack of funding and limited awareness of the shepherds and livestock owners hamper the adoption and implementation of more sustainable and efficient practices.

In Article 44, Part 2, Clause (c) of the Forest Code (1999), it is stated that forest protection measures include „banning grazing of animals on forest species and in the stands where grazing is harmful for forest". In general, forestry experts agree that grazing should be strictly forbidden in places of forest regeneration or restoration. Unfortunately, these requirements are generally not met. As a result, overgrazing causes the compaction of soil triggering erosion. Natural regeneration of forests is undermined, because the growing plants are often completely destroyed. This contributes to the irreversible degradation of biodiversity.

- ***Pests and diseases***

Pests and diseases such as chestnut canker (*Cryphonectria parasitica*) pose significant threats to forests. The Forest Code obliges forest owners (regardless their status) to conduct forest protection measures against pests and diseases. Timely detection and effective combating forest pests and diseases requires comprehensive scientific and field assessments, monitoring and active intervention measures. These measures are very difficult to implement due to the lack of funding, proper institutions and technical capacities.

- ***Non-native and invasive tree species***

According to expert estimations, planted forests cover up to 60,000 ha in Georgia. Their major purpose was to provide additional socio-ecological benefits. These plantations (so-called "forest cultures") partly consist of non-native species that are not site-adapted such as black pine (*Pinus nigra*) and are mostly monocultures of usually 50-60 years of age. The monoculture plantations are much poorer in biodiversity than "close to nature" forests with several native tree species.

The so-called "Tree of Heaven" (*Ailanthus altissima*), a native to China, could threaten the natural forest ecosystems in Georgia especially in floodplain areas: if uncontrolled it can out-compete valuable native species such as wingnut (*Pterocaria pterocarpa*) if the ecosystems of the latter are significantly degraded. Consequently, it is necessary to study the potential threat from certain invasive species in Georgia.

- ***Forest fires***

Forest fires used to affect only a few hectares of forests in Georgia, predominantly fire-prone conifers; however, with the increased incidence of droughts in recent years forest fires have become a more serious problem. Forest fires cause damage to, or destruction of, trees, bushes and natural regeneration. Fires are now affecting tens or sometimes even hundreds of hectares of forests each year. The most damaging fires in recent years occurred in 2008 when nearly 1,000 ha of forests were either seriously damaged or completely burnt in the Shida Kartli and Samtskhe-Javakheti regions. In total, around 2,500 hectares of forests have been destroyed or seriously damaged due to forest fires in the last 3 to 4 years.

Article 48 of the Forest Code (1999) is entirely dedicated to fires. It mainly describes silvicultural measures aimed at fire prevention and names the Ministry of Interior as an authority responsible for combating forest fires in coordination with relevant forest management units and tenure holders. The main regulation dealing with forest fires is the Decision of the Georgian Government # 241 (dated 13.08.2010) "On the Rules of Forest Tending and restoration". This document contains: a) general requirements for the protection from forest fires, b) detailed precautionary measures and c) measures to combat forest fires and their consequences.

In recent years, some experience was gained by the state authorities in forest fire-fighting. However, the fire detection and combating systems are not adequate. In addition, mountainous terrain, steep slopes and a lack of roads make some of the forests very difficult to access. There is also a need to distribute the responsibilities and functions more clearly among the relevant authorities (Ministry of Energy and Natural Resources, Ministry of Interior, Emergency Service and local self-governing bodies).

- ***Climate change***

Although the exact magnitudes of negative impacts of climate change upon forest biodiversity are very difficult to predict, they seem to be very significant. Georgia joined the Convention on Climate Change in 1994. However, at present there are no separate legal documents or management prescriptions addressing the impact of climate change on forests.

- ***Legal status of the forest fund***

The legal status of forest fund lands is extremely weak due to the lack of a unified systematized act in the forestry sphere. That extreme weakness is leading directly to forest fragmentation: land title registration of state owned forest lands done by the National Agency of Public Register according to the Governmental Decree #299 of August 4, 2011 "On Identification/ Delimitation of State Forest Lands Boundaries" has removed large areas of degraded forest from the state forest fund.

- ***Quality of information about the forest fund***

Apart from a few hotspots where studies have been carried out there is an almost complete lack of information about the condition of the forest fund. The most recent inventories (apart from those carried out by licence holders on a small part of the forest fund) were carried out 20 or more years ago. The lack of information makes it impossible for the government to take sound decisions about the categorisation of the fund for different objectives, including the objective of biodiversity conservation. Without proper categorisation it is impossible to decide which management operations are appropriate and which ones should be avoided.

- ***Governance of the forest fund***

Forest degradation and fragmentation are facilitated by the weak governance of the sector. Georgia still does not have a national forest policy in spite of several attempts to draft one and get it adopted by the government. A forest policy is crucial for establishing a clear vision for forests and for creating signpost and milestones for achieving the vision. The legal boundaries of the forest fund and tenure over substantial parts of the forest fund are unclear, creating uncertainty as to where forest law applies. The state organisations responsible for managing the state forest fund and enforcing forest law are under-resourced and are not able to carry out their functions effectively.

Efforts have been made to adopt a new set of forestry regulations and standards that would address biodiversity-related concerns but no significant progress has been made so far. Forest management standards need to be developed incorporating the principles adopted by the Ministerial Conference for the Protection of Forests in Europe (Forests Europe) and made obligatory for all forest users.

Further steps need to be taken to identify and map High Conservation Value Forests and to elaborate management prescriptions for them; old-growth forests should be assigned a special protection regime; the categorization system of Forests Europe could be interesting; this system encompasses protected and protective forests; for the first category, the purpose of management is biodiversity conservation, which is consistent with IUCN I, II and IV categories; the second category envisages the protection of landscapes and special natural features; management objective in the third category is maintenance of protective functions of forests.

Current Georgian forestry legislation does not adequately provide for multipurpose forest management and functional zoning. The Forest Code defines green zone, resort, soil and water protection forests and forests with special significance (floodplain and subalpine forests, buffer forests protecting roads and water bodies etc). The Code generally restricts logging operations in most of these ecologically sensitive forest categories. The concept and definition criteria for HCVFs have been included in the regulation "on the Procedure and Terms of Forest Use Licensing" (2005) with the active participation of representatives of NGOs and scientific institutions and experts. Some logging restrictions are provided for these forests. However, more detailed management prescriptions are needed to identify, map and protect valuable natural forest ecosystems, including ecological corridors, HCVFs and pristine forests.

- ***Stability of institutions***

Frequent institutional and legislative changes within the forestry sector creates uncertainty and demotivates staff of the state authorities responsible for managing forests for supervising and

controlling forest use. Limited funding for the sector, too few staff in state organisations and a lack of adequately trained staff makes it impossible to ensure that forests are managed sustainably.

Agricultural biodiversity and natural grasslands

Description of the problem in NBSAP-1

NBSAP-1 summarised the problems related to agricultural biodiversity and natural grasslands in the following way:

- ***Problems concerning agricultural biodiversity***

- Little attention is paid to the conservation of agricultural biodiversity at the national level;
- Accessible and good information on the country's agricultural biodiversity, its current status, associated products and traditions is lacking;
- Legislation for the preservation of agricultural biodiversity is lacking;
- Import/export of genetic materials is not controlled;
- Introduction of new technologies is not supervised;
- There is a lack of knowledge of, and experience in, modern techniques of ex situ and in situ conservation of agricultural biodiversity;
- There is little information exchange or experience sharing either within the country or with other states;
- There are few relevant research programmes;
- Many of the existing collections, selection stations and seed farms are no longer operational;
- Access to genetic materials is limited for both farmers and research programmes;
- Traditional knowledge regarding the use of agricultural biodiversity is being lost;
- Existing research institutes have declining capacity;
- There are no effective programmes to support farmers in biodiversity-friendly agricultural practices;
- Economic incentives for the conservation of Georgian agricultural biodiversity are lacking;
- Relevant education programmes do not exist;
- There is no mechanism to increase popular recognition of agricultural biodiversity and associated products and traditions.

- ***Problems concerning natural grasslands***

- Overexploitation of pasturelands has resulted in the degradation of plant communities and soils both in winter and summer pastures, in some cases leading to permanent damage.

Action taken and progress made since the adoption of NBSAP-1

a) Agricultural biodiversity

- ***Sustainable management of agricultural ecosystems***

    - *Sustainable agricultural practices*

There has been significant progress with certification and labelling schemes that enable traders, processors and consumers to choose products that have been produced in accordance with sustainable production principles. ELKANA Biological Farming Association, which has been working on the development of organic farming since 1994, now serves about 600 farmers. Since 2006 the organic certification body "Caucascert" Ltd has been operational in Georgia. In 2008 "Caucascert" Ltd received European accreditation, issued by the German accreditation body DAP and thus is

authorized to issue certificates that are valid in the EU. In 2011 71 producers were certified as organic according to international standards in Georgia; among them is the company Hipp Ltd which is supplied with organic apples by 1,103 smallholder farmers; "Kula" Ltd - one of the main producers of processed fruit and vegetables products in Georgia – has started to produce organic juices. The "Fairwild" scheme for certifying ecologically sound harvesting of wild plants has been implemented in Georgia and people engaged in harvesting have been trained; a centre for wild plant certification has been established in Kharagauli.

- *Research on soil biodiversity and beneficial organisms*

The Institute of Zoology of the Ilia State University (the laboratory of invertebrates) is working on a scientific study of earthworms. The Kanchaveli Institute of Plant Immunity at the Agricultural University of Georgia and the Institute of Phytopathology of the Shota Rustaveli Batumi State University work on the beneficial insects, natural entomophages and microorganisms causing plant diseases, by identifying disease resistant varieties of plants.

- *Soil mapping*

In 2002-2006 the "Cadastre and Land Register Project" co-financed by the government of Germany was implemented in Georgia. In the frame of this project a large group of soil scientists was retrained according to modern standards. The international classification of soils (WRB) was studied and for the first time in post-Soviet space soils in Georgia were classified in accordance with a modern international classification; as a result in 2009 the Soil Map of Georgia at a scale of 1:500 000 was published, with the participation of more than 50 scientists and practitioners.

- *Tackling degradation of agricultural lands*

The situation in the Mashavera river basin has been investigated during the last 7 years under the leadership of the famous soil scientist Prof. P. Felix-Hennigsen from the Institute of Soil Science and Soil Conservation of the Justus-Liebig-University (Giessen, Germany).

For the purpose of improving soil fertility, the Ministry of Agriculture of Georgia has been carrying out studies in some municipalities. Some of the studies are already completed and in the frame of on-going projects measures to mitigate soil erosion have been implemented in the Autonomous Republic of Adjara and Dedoplistskaro municipality.

A project to rehabilitate degraded agricultural lands, windbreaks and forest edges in Dedoplistskaro municipality is being carried out by GIZ with funding from BMZ. In 2012-2015 28 hectares of windbreaks will be planted and 17,000 hectares of windbreaks will be rehabilitated.

In 2012-2016 it is planned to carry out a project to rehabilitate irrigation systems in Dedoplistskaro municipality with the participation of local farmers, the Ministry of Agriculture and the Ministry of Environment Protection of Georgia.

Issues related to the impact of global climate change on agricultural biodiversity of Georgia are addressed to some extent by the 1st and 2nd National Communications to the United Nations Frame Convention on Climate Change (UNFCCC)[2].

- ***Conservation of plant genetic resources***

  - *Reintroduction of landraces of crops on farms*

Various programmes have been carried out aimed at the in situ conservation of crop landraces on farms including recovering their seed material, distributing them among farmers and establishing marketing chains for the products produced from landraces though branding, promotion and

[2] The first and second national communications are available at, respectively, http://unfccc.int/resource/docs/natc/geonc1.pdf; http://unfccc.int/resource/docs/natc/geonc2.pdf

development of their market potential. An example of such a programme is the GEF/UNDP-financed project "Conservation and Sustainable Use of Georgia's Agricultural Biodiversity" implemented by Biological Farming Association Elkana. In the frame of this project six landraces of different species of grain crops (*Triticum carthlicum* Nevsky, *Triticum aestivum* L., *Hordeum vulgare* var. *nudum*, *Secale cereale* (L.) M. Bieb, *Panicum miliaceum* L. and *Setaria italica* (L.) Beaur), five landraces of different species of legumes (*Cicer arietinum* L., *Vicia faba* L., *Lens culinaris* Medic., *Vigna unguiculata* L.Walp. and *Lathyrus sativus* L.) and one technical crop (*Linum usitatissimum* L.) were reintroduced in Samtskhe-Javakheti region. On the project's demonstration plot local varieties of grapevine and fruits were collected and multiplied with the purpose of distributing them among farmers. Marketing chains were developed for legume crops. In the frame of a project financed by BP and administered by Eurasia Foundation the seed material of the local landrace of wheat – Akhaltsikhis (Meskhuri) Tsiteli Doli - was multiplied and distributed to the farmers of Samtskhe-Javakheti and a marketing chain for the production developed.

- *Research and international cooperation on plant genetic resources*

Study of the distribution of local landraces and their wild relatives and medical plants through expeditions and enrichment of ex situ collections in the frame of their core activities, and with international support, is carried out by the Institute of Botany of Ilia State University, Tbilisi Botanical Garden, National Museum, Lomauri Institute of Farming of the Agricultural University of Georgia and Institute of Horticulture, Viticulture and Oenology of the Agricultural University of Georgia. The cooperation of the above-mentioned research institutes with the gene bank of Gaterleben (Germany) and United States Department of Agriculture (USDA) should be especially underlined. Collection of the field crops was financed in recent years by International Centre of Agricultural Research for Dry land Areas (ICARDA), Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Australian Winter Crop Gene Bank (AWCC), Australian Centre for International Agricultural Research (ACIAR), Centre for Legumes in Mediterranean Agriculture (CLIMA) etc.

Expeditions carried out in recent years were mainly focused on inventory of grain crops in Samtskhe-Javakheti (in the frame of the project financed by GEF/UNDP "Conservation and Sustainable Use of Georgia's Agrobiodiversity") and Lechkhumi and Upper Svaneti regions (joint project of the Gaterleben University and Institute of Botany); also the diversity of landraces and local varieties of grape, pip fruits and berries were investigated in Samtskhe-Javakheti (in the frame of the GEF/UNDP-financed project "Conservation and Sustainable Use of Georgia's Agrobiodiversity").

The Institute of Horticulture, Viticulture and Oenology became a participant/recipient of a reform component of a WB-funded project, which significantly strengthened its capacity through provision of scientific equipment (including a molecular laboratory) and training. The Institute benefited from several projects, including "Conservation of Grapevine Genetic Resources in the Caucasus and the North of Black Sea Area" (Biodiversity International and Hortivar/FAO). The institute's cooperation with Milan University allowed for better characterization and evaluation of local grape genetic resources. Characterization of PGR of seed and stone fruits of the temperate zone was also conducted but at a lesser scale.

In 2011, in the frame of the EU-financed project "Conservation of Agricultural Biodiversity in Arid and Semi-Arid Ecosystems" and German International Cooperation (GIZ) and implemented by "REC-Caucasus" a survey on state of landraces and influence of the climate change on them was carried out in Gori, Gardabani, Sagarejo and Dedoplistskaro districts.

The GEF/UNDP-financed project "Recovery, Conservation and Sustainable Use of Georgia's Agrobiodiversity" promoted awareness of the importance of CWRs through trainings on CWR research, management and policy issues at the Ministry of Environment in 2008. The training was carried out by Dr. Nigel Maxted from the University of Birmingham.

The characterization, evaluation and regeneration of samples in collections of genetic resources has been carried out by the Institutes of the Agricultural University of Georgia - Lomauri Institute of Farming, Institute of Horticulture, Viticulture and Oenology, Institute of Sericulture, Institute of Tea and Subtropical Crops and Tea Industry - in the frame of various international projects.

Documentation of plant genetic resources in Georgia is mostly computerized. With ICARDA's support the Lomauri Institute of Farming has established a database which includes all information and passport data on availably for its more than 2,000 samples of field crops. The Institute of Horticulture, Viticulture and Oenology has made a database of local grapevine varieties, preserved in the collections of Georgia, in the frame of the IPGRI's project "Conservation and sustainable use of grapevine genetic resources in the Caucasus and Northern Black Sea area". However there have been no catalogues published for PGRFA collections in Georgia and information preserved in the above-mentioned data bases is not freely accessible.

Information about plant genetic accessories from Georgia preserved in the USDA collections can be found at the web-site of the USDA Germplasm Resources Information Network (http://www.ars-grin.gov); there is also a Georgian database of biodiversity (http://biodiversity-georgia.net) which includes information on the wild flora and fauna of Georgia; the database includes information about some CWRs. The database was prepared by Institute of Ecology of Ilia State University with the support of BP and the Caucasian Endemics Research Centre.

The Academy of Agricultural Sciences of Georgia cooperates intensively on the conservation of plant genetic recourses important for food and agriculture with international organizations and networks such as ICARDA, IPGRI, GCDT and CACAARI.

- *Capacity of organisations involved in the conservation of plant genetic resources*

National expertise in agricultural biodiversity conservation and the capacity of research institutions working in the field of agricultural biodiversity have been strengthened; in particular a gene bank of field crops became operational in 2006 at the I. Lomauri Institute of Farming of the Agrarian University of Georgia.

Significant steps have been taken to rehabilitate or improve existing collections, selection stations and seed farms. The collections of I. Lomauri Institute of Farming of the Agrarian University of Georgia, of Tbilisi, Kutaisi and Batumi Botanical Gardens and collections of microorganisms at various research institutes have been enriched with new samples. A non-commercial legal entity "Agro-National Centre of Production of Grapevine and Fruit Planting Material" was established, with a rich collection of local fruit and grapevine varieties. Since 2011 the Centre has been multiplying and distributing the planting material of local varieties to interested farmers and organizations free of charge.

- ***Conservation of animal genetic resources***

In general, major research on local domesticated animal species conducted in Georgia encompasses the following issues:

- studying the economic and biological traits of almost all species (data on pig populations spread in Svaneti and Racha are scanty);
- studying blood, types of transferrin and haemoglobin of polymorphous blood, blood serum of local cow and sheep breeds;
- studying blood groups of local cow and Kakhetian pig breeds;
- within the Georgian mountain cow's Pshav-Khevsurian population, studying frequencies of quantitative and structural abnormalities of chromosomes, as well as the frequency of the organizing regions of the active nucleus;
- a study of genetic markers of Tushuri horse, Tushuri sheep, and the Georgian shepherd dog for breed specification is under way (Ilia University).

Genetic studies which would identify the origin of a specific breed are relatively few, for which reason there are mutually exclusive views on the origin of various breeds.

With the exception of preparation of reports on the state of genetic resources of domestic animals, no international or local projects concerning the conservation and sustainable use of local domesticated animal genetic resources have been implemented in Georgia. Small-scale projects in the direction of the conservation of the Georgian mountain cow (financed by Rustaveli Science Foundation) and of the Kakhetian pig (small-scale UN grants programme) have been implemented; however, owing to insufficient funding and spread of African swine fever, these projects have failed to be sustainable, and the breeding farms created within the framework of these projects have not survived.

Since autumn 2011, with the financial support of the MATRA - Social Transition Programme of the Embassy of the Kingdom of the Netherlands in Georgia and Armenia, the Biological Farming Association "Elkana" has been implementing a small-scale project "The Conservation and Sustainable Use of Domestic Animals at Risk of Extinction in Georgia". The project provides for on-farm conservation of local animal breeds; a demonstration farm has been set up in the village of Zemo Khodasheni (Kakheti region) where the following local breeds have been introduced for the purpose of reproduction and distribution among the interested farmers: 1) Georgian mountain cow (Tushur-Khevsuruli); 2) Tushuri sheep; 3) Megruli goat; 4) Kakhuri pig; 5) five local hen populations.

- ***Research and international cooperation on fungi and micro-organism resources***

The main research focus of recent studies in relation to fungi and micro-organism resources has been on the microbiological content of matsoni and wine yeasts. Some research was also done on the microbiology of local cheese varieties. At present four research institutes are working in the field of microbiology of food and agriculture products in Georgia: G. Eliava Institute of Bacteriophage, Microbiology and Virology; S. Durmishidze Institute of Biochemistry and Biotechnology; l. Kanchaveli Institute of Plant Immunity under the Agricultural University of Georgia; Institute of Phytopathology under the Shota Rustaveli Batumi State University. Some examples of the projects carried out in this field in recent years include:

- 1995 - Selection of endemic LAB cultures from matsoni for their potential use in flavoured butter production – the Finnish Funding Agency for Technology and Innovation and the company "Osuuskunta Maitokolmio";
- 1998-1999 - Microbiological study of the Caucasian traditional yogurt-like product matsoni - Georgian Academy of Sciences;
- 2006 - Elaboration of standardized dairy starters for traditional Caucasian dairy products (Stage I – Development of Business Plan) – Georgian-USA Research Development Foundation;
- 2007 - Commercialization of dairy starters of matsoni with improved health beneficial and biotechnological values – Georgian-USA Research Development Foundation;
- 2007-2009 - Development of standard matsoni starters with health beneficial properties - Georgian National Science Foundation;
- 2008 - Development of the starter for Imeruli cheese - Georgian-USA Research Development Foundation.

b) Natural grasslands

NBSAP-1 included the activity of conducting a pastureland inventory and assessment relative to carrying capacity, and putting in place measures to promote rehabilitation of degraded pastures. The activity had not been implemented up to the time the situation analysis was prepared.

Issues for NBSAP-2

a) Agricultural biodiversity

- ***Sustainable management of agricultural ecosystems***

    - *Policy and legislation*

Legislation and national strategy and planning documents do not provide a sufficient strong framework conserving biodiversity on territories under agriculture. The Strategic "10-Point Plan" of the Government of Georgia for Modernization and Employment (2011–2015) envisages the transfer of land into agricultural activities, which is important in respect of agricultural biodiversity; however, the Plan fails to indicate what measures will be taken to attain this target. The Law of Georgia on Cultural Heritage (2007) does not regard agricultural biodiversity as part of cultural heritage. The recently finalized and published Draft Agriculture Development Strategy of Georgia (2012-2020) dedicates a separate chapter to agricultural biodiversity: the main focus in the Strategy is on activities aimed at developing soil protection and land-reclamation infrastructure; unfortunately, the Strategy fails to highlight questions related to the development of organic agriculture.

Issues concerning the effective use and safe application of pesticides and agrochemicals are regulated by the Law on Pesticides and Agricultural Chemicals (1998). According to the Law, a necessary precondition for the safe application of pesticides and agrochemicals is the imposition by the respective services of the Ministry of Agriculture and competent agencies of the Government of Georgia of strict controls over content of the pesticide and agrochemical residue in crops, the soil and other objects of the environment. Operation of the Law is ineffective due to limited funding and institutional capacity: the National Food Agency cannot effectively carry out control measures in this direction.

In 2010, the Law on Biological Agro-production (2006) was revoked. At present, the Draft Code on Food/Feed Safety, Veterinary and Plant Protection establishes that the Government of Georgia has to ensure the adoption of a governmental resolution on "Organic production". Of importance in this respect is the prohibition of marking uncertified products with misleading labels or marks (e.g. "ecological", "organic", ecologically safe", etc.). The absence of such prohibition is one of the major factors interfering with the development of the organic farming sector in Georgia.

    - *Degradation of agricultural lands*

According to "The Second National Environmental Action Plan of Georgia for 2012-2016" land degradation is a serious problem in Georgia. Soil erosion, which is a natural phenomenon in some cases, is aggravated by the unsustainable use of soil. Soil fertility also depends on the degree of soil salinization. Soil fertility is declining due to increasing soil acidity caused by unsustainable use of fertilizers containing hydrolytic and acid salts and acid precipitation. In addition, soil pollution is caused by the unsustainable use of fertilizers (organic and mineral), toxic chemicals and heavy metals.

    - *Sustainability of agricultural practices*

After a long period of decline Georgia's independence and the loss of markets for agricultural products agriculture is starting to become more intensive and is being supported in that direction by the national policy for the sector and bilateral and multilateral aid projects. Land that has not been cultivated for years is being brought back under the plough with the inevitable impacts on plant and animal. Weak regulation of the use of pesticides is resulting in the destruction and transformation of the habitats of invertebrates. The effective use and safe application of pesticides and agrochemicals are regulated by the Law on Pesticides and Agricultural Chemicals (1998). Regrettably, operation of the Law is ineffective due to limited funding and institutional capacity; the National Food Agency cannot effectively carry out control measures in this direction. Especially in eastern Georgia irrigation

is necessary for growing crops; extraction of ground water and of water directly from rivers results in the water table and river levels falling.

- ***Conservation of plant genetic resources***

    - *In situ conservation of plant genetic resources*

Generally on-farm conservation activities in the country are limited and fragmented because of the lack of a state strategy and vision on the issue.

No significant steps have been taken on setting up reserves for the conservation of wild relatives of domestic species and medicinal plants and on encouraging seed production and exchange among local farmers.

Summarizing the main in situ conservation needs for plant genetic resources the following urgent actions can be listed:

- Studies on local landraces/CWRs, their inventory and characterization;
- Ethno-botanical and social economic studies to better understand the mechanisms of on-farm conservation of landraces;
- Improvement of local landraces by simple breeding methods such as mass selection;
- Assessment of landrace adaptability to local agro-ecosystems;
- Strategic planning at national and regional levels.

    - *Ex situ conservation of plant genetic resources*

The number of samples preserved in Georgia's research and breeding collections is small: vegetable, maize and forage crops are especially badly represented in the collections: there are very few samples of such traditional Georgian crops and land races as sorghum, millet, flax etc.; pip fruit and grape collections also need significant improvement. Georgia's collections are enriched through obtaining genetic material from world's largest gene banks and live collections. It should be mentioned that many of the landraces preserved in foreign gene banks are not available in Georgian collections.

The number of living collections of fruit trees and grapes is not satisfactory. At present there are only two collections and the future of one of those - namely the collection preserved by the Institute of Horticulture, Viticulture and Oenology of the Agricultural University of Georgia - is under threat because of the reforms carried out in the Agricultural University of Georgia. The collection of the Institute of Tea, Subtropical Crops and Tea Industry is also in bad condition because of lack of financing. The number of the living collections does not correspond to international standards: in order to guarantee the protection of the samples preserved in the collections from natural disasters, diseases and genetic erosion the living collections of fruits, grape and citruses should be located in three different places.

The living collections of CWRs in Georgia are few. Tbilisi and Batumi botanical gardens have small collections of CWRs collected in the frame of international collaborative projects. However, because of the absence of appropriate financing, it is impossible to maintain these collections after the projects come to an end and they end up being cancelled.

The State does not have the strategic vision of ex situ conservation of plant genetic resources and the maintenance of the collections is largely dependent on financial support from international donors and private investors. In order to preserve the collections of the plant genetic resources there is a need to renew the infrastructure and build the capacity of the staff of the research institutes maintaining collections. The management system of the collections should be also improved,

especially in terms of the improvement of the protection of the samples from diseases and linking the collections with breeding activities.

For the improvement of ex situ conservation the collections need to be further enriched and renewed and a State strategy of ex situ conservation should be defined. The State should have responsibility and a coordinating function for in ex situ conservation.

- ***Conservation of animal genetic resources***
    - *In situ conservation of animal genetic resources*

The majority of local landraces and breeds of domestic animals are at risk of extinction due to their uncontrolled crossing with introduced breeds. The number of preserved pure-bred animals is rather small. Also the purity of the breeds is not certain because an animal identification system is absent and the identification of purebred animals is carried out based on the phenotypic evaluation.

The spread of animal epidemics and the inefficiency of the veterinary control system create serious problems in terms of preserving local breeds (e.g. the spread of the African swine plague in 2006 has brought the oldest local Kakhuri pig population to the verge of extinction). The change to industrial agricultural production and orientation on standard products constitute additional threats to local breeds (e.g. since the Kakhuri pig has a dark skin, butchers avoid purchasing it and, correspondingly, its market price is lower). Thus raising of awareness on the products of Georgian breeds and their branding is of importance for improving this situation.

Monitoring of the distribution of local breeds of domestic animals is being carried out within the framework of different projects; however, expeditions' findings are scattered in different project reports and this makes it difficult to get a comprehensive understanding of the state of local animal genetic resources in the country. Necessary measures to be taken in this direction include the purposeful conduct of expeditions and inventory of local breeds, and distribution maps of local breeds, given that the distribution of local breeds has altered significantly during the last twenty years.

    - *Ex situ conservation of animal genetic resources*

In terms of ex situ conservation of animal genetic resources for food and agriculture, the situation in Georgia is particularly unfavourable. Georgia lacks a gene bank of animal genetic resources. The existing artificial insemination centres (e.g., Caucasus Genetics) are holding only the semen of local cow breeds (Caucasian Brown and Georgian Mountain). Since the 1970s semen samples of Georgian domestic animals have been maintained in Russia, in the Saint Petersburg Semen Bank.

- ***Conservation of fungi and micro-organism resources***
    - *In situ conservation of fungi and microorganisms*

As a result of more strict food safety requirements, development of the food industry and increased popularity of local products, the diversity of microorganisms and fungi used in the production of traditional foods is attracting more attention. In spite of significant scientific and technological interest towards artisanal cultures all over the world, relatively little research has been undertaken on natural starters of the traditional products originating from Georgia; the only exceptions are natural starters of matsoni, cheese and wine.

Study of microbiological diversity of traditional fermented products could provide important information on microbiological diversity, safety and quality characteristics of traditional products. Such information is important for the development of their industrial production as well.

The traditional processes of fermentation and microorganisms and fungi involved in the fermentation processes are also important for the registration of the Geographic Indications of traditional products. Very often a special character and quality of a producta, connected with

particular geographic locationa, is determined by its microbiological content; for example the French cheese “Roquefort”, which has a Protected Geographic Indication, is made only from milk of a particular breed of sheep and matured in the natural caves near the town of Roquefort in the Aveyron region of France, where it is infected with the spores of a fungus (*Penicillium roqueforti*) that grows in the caves.

Unfortunately the traditional fermentation methods of some products, such as bread, dambali khacho (dried cottage cheese) and traditional beer, are almost forgotten in Georgia. With the loss of traditional fermentation methods authentic products obtained though these processes are also disappearing. The decline in microbiological biodiversity and even its complete replacement by imported cultures is apparent in the production of such traditional Georgian products as e.g. matsoni, cheese, wine. Imported industrial starters are diminishing the authenticity of local products and at the same time are sometimes not in line with food safety requirements (e.g. pepsin is often used as a starter for homemade cheese).

In the 1990s local dairy factories were using so called “spontaneous starters” in the production of traditional Caucasian dairy products, but they did not meet the requirements of European market standards. Thus starting from 2000 local dairy producing companies were forced to use standard starters in the production of dairy products including traditional ones such as matsoni, nadugi (whey curd) and cheeses including imeruli (a curd cheese), sulguni (a type of Mozzarella cheese), kartuli and guda (hard cheeses). At present Georgian dairy companies use starters imported from Russia, Turkey, Denmark, Bulgaria and other countries. Imported standard starters do not originate from the Caucasian region and thus their use by the local companies may lead to diminishing of the existing biodiversity and even its complete replacement by imported cultures, since, for example, many households, even in rural regions, are inclined to use commercial dairy products available in supermarkets for the 'backslopping' domestic fermentation of matsoni.

The importance of traditional starter cultures can be easily understood from the example of research outcomes carried out on matsoni. Traditionally matsoni has been applied as a supplement of infants’ diet, as a remedy against intestinal disorders, for treating burns and dermatitis, in domestic cosmetics for the improvement of the skin and hair conditions, and as a base for special food-preserving solutions. Hence, matsoni can be considered as a potential genetic pool of strains of microbes that act against pathogens causing human and animal diseases and food-spoiling micro-organisms. In addition to their health benefits these microorganisms may have other important yet unknown properties. In spite of the long-term use of matsoni among the Caucasian population the bacteriological composition of matsoni and the genetic diversity of its components are poorly studied. Previous researchers assumed that matsoni starter is completely identical to the Bulgarian yogurt. According to another group, one of the major components of matsoni starters was the bacterium *Bifidobacterium bifidum*. However the most recent studies performed during 1995 - 2010 and based on the results of a study of the microbial composition of 40 domestic starters originating from different villages and towns in Georgia located at the altitudes of 380-1700 showed that the bacterial composition of Caucasian matsoni is remarkably different from Bulgarian yogurt. Genetic studies recently performed on 49 strains of *S. thermophilus* isolated from the domestic samples of matsoni demonstrated a significant genetic diversity of these cultures. It should also be mentioned that practically nothing is known about the genetic peculiarities of such other major components of matsoni as *Lactobacillus delbrueckii* ssp. lactic and secondary components such as *Lb. casei*, *Lb. paracasei*, *Lb. acidophilus* and matsoni yeasts.

Therefore much importance is attached to studying the yeast and starter cultures of traditional products (cheese, cottage cheese, matsoni, beer, bread, wine, etc.), identifying phenotypic properties of their bacterial cultures and selecting and conserving biotechnologically important species. Of particular importance in this respect is a dialogue between researchers and business representatives. Implementation of research projects to develop local product starters is decisive for conserving the biodiversity of these species on the one hand, and to initiate registration of

geographical indications of traditional products and industrial production of traditional products, on the other hand.

Worthy of mention is Georgia's cooperation with the European Union to ensure protection of geographical indications for a whole number of Georgian milk products, such as: matsoni, dambali khacho (cottage cheese) and cheeses such as tushuri guda, imeruli, kobi, svanuri suluguni, sulguni, guda, kartuli, tenili, acharuli chechili, meskhuri chechili. Exactly in this direction it is of decisive importance that the microbiological composition of these products be identified and their starters made easily accessible to producers within the areas of the geographical indications. Special attention in this respect should be given to regulating issues concerning the protection of intellectual property rights for traditional product starters. These measures are necessary for preventing monopolization of the market since in today's conditions there is a possibility for a company or person producing traditional products to identify the microbiological composition of, and patent the rights on, the starters of major traditional products and thus restrict the production of the particular product by other manufacturers within the area of geographical indication.

- *Ex situ Conservation of microorganisms and fungi*

The ex situ collections of microorganisms and fungi important for food and agriculture are scattered in different research institutes of the country; at the same time the number of cultures preserved in collections is very low and cultures separated from many important traditional products are not preserved in the collections at all. Besides this, the culture collections do not have an official national or international status and there is no database of the samples kept in the collections.

- ***Issues related to research institutions***

The main problems of Georgian research institutes and universities involved in research and conservation of agricultural biodiversity are as follows:

- *Unstable regulatory environment*

Recently, various reforms have been carried out in the education and research field. In 2010-2011, the reorganization of scientific and research institutes into structural units of higher education institutions was carried out (LEPL Giorgi Eliava Research Institute of Bacteriophage, Microbiology and Virology was not affected by the reform). As a result, these institutes no longer have direct state financing and they are dependent on university budgets. In addition, in case the research institutes obtain grant financing from Shota Rustaveli Science Foundation or international organizations, they will have to share it with the university. This has further complicated the already difficult financial situation of these institutes. Because of the lack of consideration towards the development of research institutes on the part of government authorities and the lack of necessary funds the dependence of these institutes on internationally-financed projects is high.

- *Lack of young skilled researchers*

There are few relevant education courses at universities, infrastructure is outdated and there are textbooks. Under conditions of low funding and permanent reorganization of research institutes, young people avoid working in the scientific-research field and look for work abroad. The equipping of university departments and laboratories is frequently poor and outdated, which discourages students from conducting quality research for a master's degree or doctorate.

- *Weak cooperation with the business/enterprise sector.*

Most institutes fail to exploit the potential of cooperation with the private sector, which could promote the conservation of agricultural biodiversity; e.g., in the spheres of breeding and testing of new plant and animal species, production and testing of plant protection and biological agents that raise soil fertility, production of traditional foodstuffs, traditional production of foodstuff starters, tourism, etc. The cause of this is both the inactivity of research institutes and the lack of business

relations skills, as well as a small interest on the part of Georgian entrepreneurial companies. The small interest on the part of the private sector is conditioned by a low trust in competence of the research institutes' personnel and the maximum restriction of investments into innovation projects owing to the young age of most Georgian companies and market instability (especially in cases where the possibility of importing standard materials from other countries exists: e.g. seed and planting material, traditional product starters, etc.). Such activities are not promoted by the State either (legislative and political environment).

- ***Policy and legal framework in relation to the conservation of genetic resources***

    - *International Treaty on Plant Genetic Resources for Food and Agriculture*

Georgia is not a party to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of the Food and Agriculture Organization (FAO). This treaty provides for a free exchange of genetic resources of food and non-food crops listed in its annexes among public gene banks and institutions of the countries members of the Treaty under a standard material transfer agreement (MTA). Georgia's non-accession up to now creates problems for Georgian gene banks and cultural flora collections in exchanging genetic material with international gene banks and collections: gene banks of member countries refrain from transferring their plant genetic resources to non-member countries.

    - *National programme for the conservation of agricultural biodiversity*

No significant steps have been taken towards adopting a national programme of conserving plant and animal genetic resources or towards a legal basis for the conservation and sustainable use of agricultural biodiversity.

    - *Red List of plant and animal genetic resources*

There is still no inventory of Georgia's agricultural biodiversity and no steps have been taken towards producing a "Red List" of domestic plants and animals or towards developing action plans for endangered species and varieties.

    - *Legislation in the Sphere of Intellectual Property Rights*

The Patent Law of Georgia (1999) regulates the granting an industrial patent. According to Article 17, "A patent shall not be granted in respect of inventions relating to plant or animal varieties or essentially biological processes for the production of plants and animals". This means that cultivated plants and domesticated animal species are beyond the scope of the law. However, "this provision shall not apply to microbiological processes or the products thereof", which means that the methods of producing local product starters (a combination of microorganisms contained therein) can be patented. To avoid the risk of "bio-piracy", special attention should be paid to patenting of traditional product starters, as there is a threat that the microbial composition of local starters can be patented by one organization and that will have a monopolistic status on the local or international market. Traditional product starters should be accessible for local producers; especially if the products are "protected geographical indications". The easiest way of achieving this is for the State to finance, even if only partially, the establishment and patenting of the method of traditional product starters and for a public organization to be the patent holder.

Together with other measures, strict control needs to be exercised over the export of non-studied and unprotected endemic microorganisms. Protection of appellations of origin and identification of starter compositions will make it possible to protect Georgian products from their adulterated analogues on international markets and allow original locally-made products to access these markets. For example, a Japanese producer of dairy starters and products is selling a product known as "Matsoni – Caspian Sea yoghurt", being advertised as originating in Georgia and as one of the factors of longevity of the Caucasian population. However, the composition of this product is

completely different from that of Georgian matsoni, for it contains only mesophilic bacteria: *L. lactis* subsp. *cremoris* and *Acetobacter orientalis*, whereas the dominant flora in matsoni is represented by *Lb. delbrueki* and *S. thermophilus*.

The matters of the right of intellectual property on plant and animal varieties/breeds and permission for their distribution are regulated by the Law of Georgia on New Breeds of Animals and Varieties of Plants (2010). The law primarily concerns the relationships with legal protection of new animal and plant varieties (the right of selection) and applies to all genera and species of agricultural animals and plants. Accordingly, the indigenous varieties/breeds (landraces) of popular selection are beyond the scope of the Law. It is interesting that following reversal in 2010 of the Law of Georgia on Permission for Distribution of Varieties of Agricultural Crops, Quality Seeds and Planting Material (1999), the issues of permission for distribution in Georgia of quality seed and planting material have been transferred to Chapter 9 of the Law of Georgia on New Breeds of Animals and Varieties of Plants, according to which "seeds and planting material are permitted for distribution in Georgia: a) by a certificate of quality; b) by a phytosanitary certificate. Additional conditions of distribution of seeds and planting materials in Georgia shall be defined by a resolution of the Government of Georgia". It is to be noted that the said resolution has not been passed up to this day; therefore it is unclear under what conditions seed and planting material of landraces shall be distributed according to this Law.

Sakpatenti has drafted a set of amendments to the Law of Georgia on New Breeds of Animals and Varieties of Plants and presented them to the Parliament of Georgia for consideration. According to the draft law, Sakpatenti shall ensure the entry of traditional agricultural, domesticated animals and cultivated crop varieties of local origin in a register and inform the public through publication of an official bulletin; a conclusion on the morphological and biological characteristics and botanical traits of these varieties/breeds shall be made by the Ministry of Agriculture. The adoption of such a law is important in that it implies inventory of these varieties/breeds (landraces), their formal registration and that it will protect their names from being misused and adulterated (e.g., currently, most sheep in East Georgia are named as "Tushuri", irrespective of the circumstance that sheep in local locks are very mixed with other breeds and, accordingly, some of them have very little in common with the aboriginal Tushetian breed). The draft law includes one very disputable provision, implying the granting by Sakpatenti of the right to use landraces for commercial purposes subject to payment of a fee. The imposition of such strict regulation on the use of landraces violates the rights of small-holders since the landraces have been selected by the efforts of those small-holders and their ancestors and are their legacy. The imposition of a levy on the use of local sheep breeds, when most of them cannot compete with industrial breeds/varieties due to low productivity, may result in extinction of the landraces.

b) Natural grasslands

Pastures are severely degraded due to overutilization. Erosion processes are very intensive and this, together with desertification on winter pastures, poses serious threats to biodiversity and local agriculture. In areas of intensive grazing the vegetation cover has been changed and erosion processes intensified. At present grazing in Georgia is carried out in a non-systematic, unorganized manner. The traditional practices related to the zoning of alpine pastures are no longer applied by the farmers. To avoid overgrazing and degradation of pastures it is important to establish and then ensure the implementation of grazing rules. Sustainable pasture management should be one of the priority objectives for the protection of biodiversity and local economic development.

Alpine, arid and semi-arid natural grasslands are very sensitive to climate change. Mountain ecosystems tend to support a high number of endemic species, many of which are adapted to extreme conditions, including low temperatures. Plants adapted to low temperatures with a slow growth rate may be replaced by thermophilic species whose spread is limited by low temperature existing in the upper parts of mountainous regions. Along with the increase in annual mean

temperature this temperature barrier will raise vertically to comparatively higher mountainous areas. It will stimulate the vertical migration of heat-loving plants that of a high rate of propagation). Invasion of new species in high mountains will lead changes in plant communities: in alpine zones, for example, there is likely to be a reduction in typical alpine species (especially in the nival zone), and there may be a complete loss of certain communities.

Current understanding of the impact of climate change on biodiversity in Georgia is extremely limited and no credible assessments have been done to determine the influence of stress factors caused by climate change on natural grasslands.

Freshwater ecosystems

Description of the problem in NBSAP-1

In NBSAP-1 the biodiversity of freshwater ecosystems was not a separate topic. In the situation analysis for hunting and fishing it was noted that reproduction of fish stocks had decreased significantly since 1991 and some reproductive facilities had been destroyed. Use of chemicals and electric shock during fishing were frequent. Poaching, and dams on the migration spawning routes of anadromous fish such as sturgeon had been found to be an insurmountable barrier to the fish migrating to their spawning areas. It was noted that the ecological condition of water reservoirs in the country had become much worse in recent years. Stocks of valuable fish species had been significantly decreased; Atlantic sturgeon, Black Sea salmon and a number of other species were near to extinction.

Action taken and progress made since the adoption of NBSAP-1

Although the analysis presented in NBSAP-1 showed the poor condition of the biodiversity of Georgia's freshwater ecosystems the NBSAP did not include objectives and activities under the theme of freshwater ecosystems. Nevertheless some of the activities that have been carried out since NBSAP-1 was adopted are relevant to the biodiversity of freshwater ecosystems:

- Establishment of protected areas on the Javakheti Plateau, including the lakes Khanchali, Madatapa and Bugdasheni.
- Preparation of documents proposing Khanchali, Madtapha, Bughdasheni and Paravani lakes and Kartsakhi and Sulda swamps as Ramsar sites.
- Assessment of the status of rare plant and animal species in accordance with IUCN categories and incorporation of the results into the new Red List).
- The establishment of bird ringing centres, including at freshwater sites.
- Assessment of the impact of alien invasive species.
- Improvements to the procedures for licensing the hunting of migratory birds.

Issues for NBSAP-2

- ***Overview***

Most internal waters are not protected and have been and continue to be modified as a result of anthropogenic factors (water pollution, illegal fishing and dams). The problem is compounded by invasive species. These factors have a serious negative impact on the biodiversity of internal waters.

- ***Pollution***

Pollution of surface waters in Georgia by organic substances such as phenols, hydrocarbons, copper, manganese, zinc and nitrates significantly exceed threshold levels. Until recent years surface waters in lowland areas were heavily polluted by chemical fertilizers, industrial waste and sewage waters. The first two factors were reduced considerably as a result of the reductions in agricultural and

industrial activity brought about by the economic crises which followed Georgia's independence. It is likely that there is still a large quantity of dangerous elements (heavy metals) concentrated at the bottom of water reservoirs. At present the main sources of surface water pollution are municipal sewage systems, pharmaceutical factories and industrial facilities.

- ***Illegal fishing***

Illegal fishing remains a major problem. Poachers often use electric devices, poisoning and explosive substances that cause irreparable damage to the biodiversity of Georgia's internal waters. Despite prohibition dynamite is often used in the estuaries of the rivers Kintrishi and Dekhva and other rivers. One hundred kilogrammes of fish is sometimes obtained with one shot. Poachers select only large fish, leaving the smaller dead ones in the river. Dynamite is used even in the fish reproduction season.

- ***Information about the condition of freshwater biodiversity***

The exact current condition of fish species in internal waters (except sturgeon and the Black Sea salmon), among them species endemic to the Caucasus ecoregion, is unknown. A comprehensive inventory and evaluation of the ecological condition of Georgia's internal waters has not been carried out.

The lack of a monitoring system and of qualified staff exacerbates the threats to the biodiversity of Georgia's internal waters. Old and incomplete data makes it impossible to prescribe activities which are necessary for sustainable fisheries management.

There is a great inaccuracy in connection with stocks and quotas of licensed water reservoirs: in most cases quotas are equal to or not much less than stocks, which confirms the need for serious studies to be carried out in this field.

- ***Damming of rivers***

The construction of infrastructure and diversion of rivers for generating hydro-electricity destroy fish and fisheries. Dams and diversions block fish migration routes causing reductions in fish populations in the higher reaches of the affected rivers. Fish reproduction declines and fish movement from the lower reaches is stopped. In addition, water flow and quality is significantly changed below the infrastructure.

- ***Problems faced by licensees***

Licensees face the following problems: it's hard for them to find experts to carry out preliminary research of water reservoirs; they demand government support for the development of reservoir infrastructure. The problem of poaching is also unsolved; fisheries licence holders want the government to intensify control in the regions and to increase the staff of the environmental inspectorate who will regularly and seasonally control reservoirs.

The Black Sea

Description of the problem in NBSAP-1

The only problem statement related to Black Sea biodiversity in NBSAP-1 was the pressure on certain fish species as a result of unsustainable fishing.

Action taken and progress made since the adoption of NBSAP-1

NBSAP-1 did not include any objectives or activities directly related to the Black Sea apart from the activity of elaborating and implementing a marine mammal conservation action plan and the activity

of assessing the impact of invasive species and developing management strategies for selected species. No steps have been taken to implement those activities so far.

Georgia has acted together with the other countries of the Black Sea basin in the frame of the Convention on the Protection of the Black Sea against Pollution, the protocols[3] to the Convention, and the Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea, which was adopted in the frame of the Convention in 2009. Actions that have been taken include:

- Pilot exercises concerning the analysis and control of sediments (organic and inorganic), water column (nutrients), zooplankton, benthos and phytoplankton in the frame of the UNDP/GEF-funded project Restoration of the Black Sea ecosystems II Phase.
- Creation of a scientific network in the Black Sea and coastal zones of Black Sea countries and integration and harmonization with relevant EU networks.
- Action to control pollutants in the frame of a UNDP/GEF-funded project.
- Implementation of integrated coastal zone management along part of Georgia's coastline in the frame of a World Bank/GEF-funded project.

Issues for NBSAP-2

The Black Sea continues to be under severe pressure from five factors: eutrophication; pollution by chemicals; unsustainable fishing; invasive alien species; modification of natural habitats.

Eutrophication

Eutrophication of the Black Sea is a result of anthropogenic and natural processes: pollution of rivers and seas from anthropogenic sources stimulates the growth of bacteria that produce hydrogen sulphide and methane; this leads to an increase in dead zones rich in hydrogen sulphide; the lack of oxygen leads to the death of live organisms, which results in more organic pollution and an increase in the content of hydrogen sulphide. According to one pessimistic forecast the Black Sea will be dead by 2020.

Chemical pollution

Georgia's Black Sea waters are polluted by oil and by metals such as zinc, cadmium and mercury. Carcinogenic hydrocarbons associated with oil pollution have been found in the tissue of fish and mussels. Pollution by oil products accumulates toxins in bivalve molluscs and hampers their ability to filter water; as the speed of filtration by bivalve molluscs falls, the quality of water declines. The concentrations of metals found in samples taken from surface waters do not exceed the permissible limit. However, conclusions cannot be based solely on water analysis. Heavy metals are capable of sedimentation; therefore their concentration must be higher on the bottom.

Unsustainable fishing

Pressure on fish stocks caused by overfishing has a negative impact on the Black Seas ecosystems. There is insufficient scientifically sound information for setting quotas. Apart from the impact on fish stocks, excessive fishing contributes to eutrophication: some commercial species feed on phytoplankton and a decrease in their number leads to a mass increase in the amount of phytoplankton. Sustainable management and harvesting of the Black Sea's fish stocks requires cooperation between all of the countries of the Black Sea basin.

[3] The protocols to the Convention on the Protection of the Black Sea against Pollution which Georgia has signed are: the Protocol on Protection of The Black Sea Marine Environment Against Pollution from Land Based Sources; the Protocol on Cooperation in Combating Pollution of the Black Sea Marine Environment by Oil And Other Harmful Substances in Emergency Situations; the Protocol on The Protection of the Black Sea Marine Environment Against Pollution by Dumping; and the Protocol on Black Sea Biodiversity and Landscape Conservation.

In 2011 the government amended fishing regulations to allow the use of bottom trawls and a decrease in the mesh size of fishing nets. Bottom trawls are especially dangerous for benthic communities. Disturbance caused by the use of bottom trawl affects benthos habitats and the structure of the communities. Frequent use of trawl leads to a degraded ecosystem consisting of minor organisms and a small number of species. The use of bottom trawl annihilates filtering molluscs that are a food source for numerous benthos fish, including sturgeon. Sites suitable for feeding and spawning are also destroyed. Long-term use of bottom trawls (for several subsequent days) affects water turbidity and bottom structure: corpuscles rising from the bottom spread over several kilometres and reduce the transparency of water; the bottom remains a "plough land" for a long time. Reduction of water transparency affects the process of photosynthesis and the concentration of oxygen is reduced in the thin layer of the Black Sea inhabited by living organisms. Bottom trawl also affects top predators such as dolphins. Due to the availability of food, dolphins often follow seiners in groups and are entangled in trawls.

In the Georgian part of the Black Sea the use of bottom trawl is permitted almost on the entire territory. This territory embraces the estuaries of large rivers, spawning sites for numerous fish species, rich benthos cenoses and feeding territories for all three dolphin species. Bottom trawls may cause additional problems in Georgian territorial waters. The depth of water rich in hydrogen sulphide and its spatial and seasonal change is not yet studied. Therefore, trawls may lead to the mixing of this water with the aerobic layer. This will lead to deterioration in the quality of water.

Invasive alien species

Anthropogenic introduction of alien species in the Black Sea, whether intentional or occasional, started in the 19th century. Out of 26 invasive species of the Black Sea, six have affected its ecosystem to a great extent. These species are: comb jelly (*Mnemiopsis leidyi*), mud crab (*Rhithopanopeus harrisi*), Black Sea topshell (*Rapana thomasiana*, or *Rapana venosa*), the molluscs *Mya arenaria* and *Cunearca cornea* and the fish species *Mugil soiuy* or *Liza haematocheilus*.

The highest negative impact is caused by comb jelly. It was brought to the Black Sea in the 1980s from the Atlantic coastline, probably due to the spilling of ballast waters. It is a raptor feeding on a broad spectrum of prey species (fish larvae, spawns, crustaceans and other species of zooplankton); it is a hermaphrodite with high speed of propagation. It can survive in the broad spectrum of hydrographic environment. The increase in the number of comb jelly coincided with the decrease in the amount of ichthyoplankton and mesozooplankton as well as the decrease in the diversity of species. Some crustacean species have totally disappeared. The effect of comb jelly was highest on fish spawning in summer, mostly anchovy. There is a negative correlation between the density of fish spawning in winter and the density of comb jelly.

Another invasive species affecting Black Sea ecosystems is rapana whelk (*Rapana thomasiana*, or *Rapana venosa*). It has caused a decrease in the number of bivalve populations. Bivalves filter the water and a decrease in their number leads to a deterioration in water quality. Furthermore, bivalves and mussels are a main food for fish, including rare species such sturgeon); a decrease in food resources naturally leads to a decrease in the number of fish.

Modification of natural systems

Georgia's Black Sea coastal zone is threatened by urban and industrial development. In 2011 the government announced plans for a new city - Lazika – with an eventual population of half a million people. The government also announced construction of a new port at Anaklia, which is the location of one of the deepest canyons on the Black Sea coast, which makes it convenient for the construction of a sea port. Numerous fish species spawn on this territory. The place is also favourable for the sturgeon species on the IUCN Red List and Red List of Georgia. The coastal waters off Anaklia are feeding grounds for all the three dolphin species, which are on the IUCN Red List. The process of active urbanization will increase the amount of sewage and other types of pollution. This will

enhance eutrophication and decrease oxygen levels in the Black Sea. Eutrophication will be aggravated by the change in the hydrological regime caused by bog reclamation.

Ineffective implementation of environmental impact permits and environmental impact assessment procedures is resulting in the degradation and fragmentation of habitats from the construction of new infrastructure and industrial development.

Crosscutting issues and governance

This chapter draws together content from the situation analyses that cuts across several or more of the topics presented so far in this synthesis.

a) Integration of the value of biodiversity into policies, strategies, planning process and regulation

Description of the problem in NBSAP-1

NBAPS-1 noted the following problems with regard to the integration of biodiversity:

- The economic value of biological diversity, the costs for biodiversity compensation and relevant rates for user groups have not been calculated and established.
- The real values of biodiversity (and possible costs of damage to the resource base) are not taken into account in determining taxes on natural resource use, resulting in unsustainable use of natural resources and under-valuation.
- The current pollution charging system does not consider costs associated with damage to biodiversity.
- The penalties established under the law “On Changes and Amendments to the Code if Administrative Offences, Criminal Code and Code of Criminal Procedures of Georgia” are too low to provide a real deterrent (particularly for category 1 and 2 offences) and do not reflect the current economic realities and real costs of damage.

Action taken and progress made since the adoption of NBSAP-1

NBSAP-1 includes the following objectives with regard to integrating biodiversity values:

- To bring the budget law and tax law in line with environmental legislation of Georgia, to ensure economic mechanisms such as environmental insurance and eco-labelling are introduced, and that environmentally friendly technologies are promoted.
- To create additional financial mechanisms to promote biodiversity conservation (taking into account the risk factors facing protected areas, the need for insurance mechanisms to indemnify financial risks, and the opportunity for cross-sectoral debate between state crediting institutions and ministries.
- To take into consideration the main aspects of biodiversity conservation when formulating economic policies.
- To assess and value biodiversity in protected areas using new methods and techniques.
- To create sustainable economic mechanisms for the conservation of biodiversity.
- To provide economic incentives for low-waste production methods and for waste treatment.

Out of the above progress has been made in relation to valuing biodiversity in protected areas and assessing the economic consequences of losing biodiversity: economic valuations of ecosystem services were carried out in Tusheti Protected Areas and Borjomi-Kharagauli National Park in the framework of the TEEB pilot project.

Issues for NBSAP-2

- ***The importance given to biodiversity in policies, strategies and planning processes***

Georgia is continuing along a path of rapid economic growth to improve living standards for everyone and lift the poor out of poverty. In such a development scenario the value of biodiversity can easily be overlooked in national and local development strategies, spatial planning processes and environmental impact assessment procedures. National strategy and planning documents - the *Strategic "10-Point Plan" of the Government of Georgia for Modernization and Employment (2011–2015)*, the *State Strategy for Regional Development of Georgia (2010-2017)* – make reference to the importance of environmental protection but do not explain how economic development and protection of biodiversity will be balanced. The national strategy for the development of hydro-electric power and plans for a new city – Lazika – in the Black Sea coastal zone are indications that the need to protect biodiversity is still not given enough weight. The situation analyses raise concerns about the efficacy of the current environment impact assessment and environment impact permit procedures, which are important instruments for mitigating the impacts of development. There are concerns too that the value of biodiversity is not properly reflected in fees for the use of natural resources.

- ***Taking into account the economic value of biodiversity***

In most countries, including Georgia, goods and services provided by ecosystems have not been economically valued. A country could cut its forests and deplete its fish stocks, and this would show only as a positive gain in GDP without accounting for the corresponding decline in natural capital. Assessment of the role of ecosystems in the country's economy at the national level is a new trend that can gradually attract decision-makers' attention in the medium-term perspective. The Economics of Ecosystems and Biodiversity (TEEB) is a global initiative focused on drawing attention to the economic benefits of biodiversity. Its objective is to highlight the growing cost of biodiversity loss and ecosystem degradation. TEEB presents an approach that can help decision-makers recognize, demonstrate and capture the values of ecosystems and biodiversity, including how to incorporate these values into decision-making.

Georgia has offered to be a pilot country for a TEEB Scoping Study which is now under preparation. In this context, economic valuations of ecosystem services of protected areas have already been undertaken. They reveal that protected areas are indispensable for generating economic benefits from tourism. Protected areas also benefit other economic sectors such as agriculture, hydropower, fishery and fresh water supply. Furthermore, it is likely that sustainable management of protected areas will contribute to poverty elimination and fair sharing of resources and will promote transformation of economic values of biodiversity into a financing mechanism for protected areas.

- ***Public participation in decision-making***

Public participation in decision-making can help bring balance into policy and planning documents and improve draft legislation. Georgian legislation does not establish an obligation to provide for public participation in the development of legislative, political and strategic planning documents. Although in some cases these documents are published in draft version for public hearings, this is largely due to pressure from NGOs and donors. Consultations generally have the character of a formal procedure and have rarely been a real influence on the decision maker. Public interest in public hearings is still very low; in fact, the public generally does not influence the decision-making process due, on the one hand to the public's low awareness, lack of knowledge and relevant experience, and, on the other hand, to the fact that public participation is not understood by decision makers as a possible tool for optimal decision making. In some cases the developer is not able to explain matters properly to the public or to organize public hearings. Social and economic conditions also play an important role: generally the public give them higher priority than

environmental protection and biodiversity conservation; because of that, in most cases the public are interested in the project only for employment.

In order for civil society to be able to participate in decision making people need to have access to environmental information. Environmental information is not legally defined in Georgia; nor are the types of information in the field of biodiversity conservation and of natural resources which should be available to the public and relevant government agencies, including in electronic form.

b) Reform of incentives

Description of the problem in NBSAP-1

The NBSAP-1 does not describe any problems with regard to economic incentives; nevertheless the document includes a number of specific objectives and activities related to incentives:

- Bring the budget law and tax law in line with environmental legislation of Georgia, to ensure economic mechanisms such as environmental insurance and eco-labelling are introduced, and that environmentally friendly technologies are promoted.
- Create additional financial mechanisms to promote biodiversity conservation (taking into account the risk factors facing protected areas, the need for insurance mechanisms to indemnify financial risks, and the opportunity for cross-sectoral debate between state crediting institutions and ministries.
- Create sustainable economic mechanisms for the conservation of biodiversity (including by providing.
- Create legal mechanisms for economic incentives for sustainable use of biodiversity.

Action taken and progress made since the adoption of NBSAP-1

No specific actions have been taken in relation to the reform of incentives since the adoption of NBSAP-1.

Issues for NBSAP-2

Instances of incentives offered in Georgia which could be considered harmful to biodiversity are programmes to encourage the planting of GMO crops such as maize and wheat, cheap lines of credit from multilateral and bilateral lenders for financing infrastructure projects that may have harmful impacts on biodiversity.

There are tax breaks for certain types of natural resource users. According to the Law of Georgia on Fee on the Use of Natural Resources, tax is reduced by 70% for those users of natural resources who carry out scientific and cultural-educational activities related to the extraction of natural resources, and for those users of natural resources who implement recovery and reproduction of natural resources on their own. To facilitate the creation of hunting farms, the Tax Code of Georgia states that the lands occupied by hunting farms are exempted from property tax. The efficiency of these instruments is too weak to stimulate environmental protection and sustainable use of biodiversity.

e) Biosafety

Description of the problem in NBSAP-1

NBSAP-1 noted the following problems with regard to biosafety:

- Current legislation fails to regulate the use of biotechnology
- Current legislation fails to control the national, or international movement of GMOs
- There is little information on the short or long term impacts (ecological, social or economic) of GMOs
- There is little information concerning alternative options to the use of GMOs in Georgia

- There is little capacity to assess the risks of biotechnology use
- There is poor understanding of how to prevent the accidental release of GMOs in to the
- environment, and low capacity of how to respond in this situation
- There is little information concerning the current situation relating to the use and transport of GMOs in Georgia, and low awareness of safe use of GMOs
- Current legislation fails to provide for the public right to monitor the GMOs
- There is low capacity of the authorities regulating this field, and of the experts involved in the use and distribution of GMOs

Action taken and progress made since the adoption of NBSAP-1

- ***Controls over the production, import and export of GMOs***

Controls over the export and import of genetic resources have been improved through increases in the capacity of Georgia's customs service.

- ***Research projects and capacity of research organisations***

In 2002-2005 Georgia participated in the UNEP/GEF-supported global project "National Biosafety Framework Development" which aimed at establishing the foundations for the ratification of the Cartagena Protocol and observation of assumed obligations. The project was carried out in 23 countries of the world. In the course of the project documents were elaborated to form a national biosafety framework and a draft law on genetically modified organisms. Project activities were carried out to inform the public and raise public awareness.

The level of development and needs of agricultural biotechnologies were assessed during the course of the project. Working meetings with decision makers, farmers' associations and business-operators were conducted. Also the condition of Georgian laboratories was assessed from the standpoint of finding means to further develop their capacity.

The non-governmental sector in Georgia holds a strict position with regards to the need for state regulation of LMOs (especially from the standpoint of release into environment). The Greens Movement of Georgia regularly carries out public awareness campaigns with regards to LMO threats to environment (also on human health). These campaigns have played a significant role in forming public opinion.

Four scientific projects were implemented in 2005-2012 in the field of biosafety by Ivane Beritashvili Biomedicine Experimental Centre, funded by the National Scientific Fund. The goal of the research was testing, implementation and elaboration of GMO detection methodology.

GMO study and analysis is of crucial importance in Georgia for the following purposes: to assess seed and food quality and safety; to meet consumer demand; to protect local biodiversity; to implement legislation according to international obligations especially after ratification of Cartagena Protocol. The implementation of GMO legislation requires reinforcement of a suitable scientific basis for monitoring of GMOs.

At present there is only one officially accredited laboratory in the field of GMO detection – at the Institute for Horticulture, Viticulture and Wine Making, which has been certified by the Unified National Body of Accreditation - Accreditation Centre.

In 2004 study of GMOs was started by the biotechnology group of the Institute of Molecular Biology and Biological Physics (Tbilisi, Georgia). A laboratory for GMO analysis was established on the basis of this group in March 2008. This was the first laboratory engaged with GMO analysis in the southern Caucasus (Georgia, Armenia and Azerbaijan).

A laboratory at the Faculty of Exact and Natural Sciences of Javakhishvili State University is equipped with some devices for performing DNA-based qualitative detection and analysis for GMOs through

the PCR method. Further capacity is planned within the framework of the TEMPUS programme. The laboratory has been selected in the course of an FAO project for regional training in GMO detection, to be conducted in the first half of the current year. For the purposes of the training, the laboratory will be provided with all appropriate reagents and other materials under the FAO project.

As for other laboratories, the Central Reference Laboratory, operating within the framework of Cooperative Threat Reduction program (CTRO), has been built with funding from the Biological Threat Reduction Programme of the US Government (BTRP) and has been fully equipped with modern equipment. The Levan Samkharauli National Forensics Bureau Biological Laboratory is also appropriately equipped.

Issues for NBSAP-2

- ***Policy and instruments related to GMOs***

As of today, in spite of its importance for the conservation of local biodiversity biosafety is not considered to be one of the priorities of national policy in Georgia. This may be caused by lack of basic information and appropriate research, providing decision-makers with an appropriate basis for policy-making; for instance, there is no assessment of imports of genetically modified seeding and planting stock. Against this background it is important that the Second National Environmental Action Plan (2012-2016) states that it is important to have updated information on the share of LMOs in imported seed and planting material and in agricultural products.

International instruments of biosafety are not yet fully applied. Up to now no notifications under the preliminarily justified consent procedure provided for under the Cartagena Protocol have been received by Georgia. Georgia does import agricultural products from countries that are party to the protocol and from LMO producers; however, it is not known whether GM products have been imported from these countries or not, and if they have, why Cartagena Protocol procedures were not initiated.

Given the lack of appropriate legal requirements, LMOs imported into Georgia are not registered; no monitoring of release into the environment or market placement is taking place. The law does not require declaration of GM seeding or planting stocks, their labelling, advance notification and consent on import. In the absence of labelling requirements, farmers do not know whether they are cultivating LMOs; consequently it is impossible to establish changes in areas under LMO crops (which would have been a good indicator for assessment of impact on biodiversity). As part of the national system of biodiversity monitoring currently being established one of the selected indicators is change of total volume of imported GM seeding stock. In order to apply the indicator, it is necessary to define data collection and accounting measures.

Due to lack of an appropriate accounting and monitoring system there is no official data available on LMO spread and use. Informal data originates from various non-governmental organizations and the press; this information is not being studied or checked by governmental agencies and the distribution and distribution channels of LMOs remain unknown.

Because of high risk of genetic contamination of local varieties and their wild relatives the use of GM seeding and planting stock may present a serious threat to Georgia's agricultural and biological diversity. Consequently it is of high importance to ensure safe transboundary transportation and handling of LMOs in order to achieve an appropriate level of protection for biodiversity conservation. One of the solutions may be to support the development of local seeding and planting stock production by adopting appropriate policies, human resources development and technology development levels.

Legislative amendments should be prepared from the standpoint of providing territorial restrictions on the release of LMOs; for instance, imposing prohibition on the cultivation of LMOs in all categories of protected territories (including protected landscapes and multiple use territories). It is also necessary to settle issues arising from the coexistence of bio-farmers and farmers who cultivate

LMOs. Based on detailed legal analysis, local governing bodies and individual farmers should be entitled to declare territories LMO free zones. It is also necessary to examine possible restrictions on the release into the environment of GMOs whose wild relatives and local varieties are to be found in Georgia.

- ***Research capacity in the field of GMOs***

Existing scientific capacity for risk assessment and management is very scarce; almost none of the universities or research centres under them are purposefully studying GMO related risks and risk assessment and management issues. The number of scientists trained in biosafety is very small, experience being especially scarce from the standpoint of risk assessment, management and appropriate mitigating measures. At present there is only one laboratory accredited for GMO detection which, once national legislation on biosafety is adopted, will not be able to cope with demand. Other laboratories may have potential but their profile is different, being more focused on education, scientific research, medical and other purposes. 5) Establishment of appropriate scientific capacity should be supported; expert registration and creation of a database of experts with specialized experience in the field of biosafety risk assessment and management would be desirable.

- ***Farmer awareness on GMOs***

The level of farmer awareness with regards to the advantages and drawbacks of GMO production and related risks is low. There are no specific educational modules for farmers. In the absence of a requirement to label GMO seeding and planting stock labelling, farmers do not know whether they are using such stock. On the other hand importers of seeding and planting stock state that they do not import GMO derived stock as local farmers would refuse to buy it.

It would be feasible, whilst establishing an extension system in accordance with the agriculture development strategy, to incorporate modules on farmer awareness-raising and education on GMO related risks, as well as GMO safe handling, storage and transportation issues.

f) Biodiversity Monitoring

Description of the problem in NBSAP-1

NBSAP-1 noted the importance of monitoring biodiversity and identified the following problems:

- Current legislation on biodiversity monitoring was inadequate and general;
- Responsibilities were not clearly defined among the responsible agencies;
- There was no agreed and integrated methods of biodiversity monitoring;
- The lack of unified census techniques meant that much biodiversity data was collected in an unsystematic and irregular manner;
- Information exchange between responsible agencies was poor;
- An easily accessible electronic data base did not yet exist;
- There was limited understanding of modern monitoring techniques within the country.

Action taken and progress made since the adoption of NBSAP-1

NBSAP-1 set the following strategic goal and specific objectives with regard to biodiversity monitoring:

Strategic goal:

- To develop a biodiversity monitoring system and an active and integrated biodiversity database to ensure sustainable use and conservation of biological resources.

Specific objectives:

- To enhance the legal base for biodiversity monitoring
- To strengthen the role of the Environmental Ministry in the field of biodiversity monitoring
- To create a regularly up-dated biodiversity data base
- To provide systematic reports to the general public about the status of biodiversity
- To designate an independent entity responsible for biodiversity data analysis and for the development of recommendations from monitoring.

- ***Legal basis for biodiversity monitoring***

The legal basis for biodiversity monitoring has been strengthened by the adoption of two Ministerial Orders:

- Ministerial Order (22.05.2009) on the approval of the indicators of the NBMS and their standard forms as well as on the NBMS Coordination Committee to ensure the establishment of the NBMS.
- Ministerial Order (20.12.2010) on the approval of the methodologies of 17 indicators of the NBMS.

A draft of a new Ministerial Order, which should replace the above-mentioned Ministerial Orders, has been prepared and was agreed internally in the MoEP in September, 2012. The order should approve all 26 biodiversity indicators, their methodologies and the procedure and rules of the implementation of the NBMS in Georgia. Currently the formal procedures to finalize the adoption of this new order are stopped due to organizational changes.

- ***Establishment of a National Biodiversity Monitoring Service (NBMS)***

The MoEP has employed a NBMS Coordinator, who is responsible for the coordination of all steps within the implementation of the NBMS. The NBMS Coordinator is supported by the staff of the Biodiversity Protection Service (BPS) and backstopped by an international expert.

The MoEP has established a NBMS Steering Committee, which consists of various representatives of governmental and non-governmental organizations as well as scientific and international organizations. On the basis of the monitoring results, the NBMS Steering Committee should develop recommendations for improving the policies and the legal framework of biodiversity protection.

A Memorandum of Understanding (cooperation agreement) on sustainable cooperation in the field of biodiversity monitoring in Georgia was signed on 27.05.2011 between the MoEP and the following institutions:

- Ilia State University
- Ivane Javakhishvili Tbilisi State University
- WWF Caucasus
- IUCN Caucasus
- The Greens Movement of Georgia

- ***Elaboration of indicators***

26 biodiversity indicators have been elaborated together with their methodologies as well as the general procedure and rules of the implementation of the NBMS in Georgia.

- ***Data collection and evaluation***

In the frame of the data evaluation, a database for each biodiversity indicator of the NBMS has been prepared. These databases are updated on a regular basis. However, not all indicators need to be measured on a yearly basis. Therefore, a specific Biodiversity Monitoring Plan, indicating the monitoring schedule for each biodiversity indicators, will be elaborated.

- ***Communication***

The public will be informed about the status of biodiversity through:

- Annual reports on NBMS,
- BioTrends (describing the monitoring results on the individual biodiversity indicators), NBMS Webpage.

For the calculation of the biodiversity indicators various governmental and non-governmental organizations are providing raw data on a regular basis to the BPS. The cooperation with some of these organizations has been strengthened by concluding cooperation agreements with the MoEP.

On the basis of the monitoring results the NBMS Steering Committee should elaborate recommendations for improving the policies and the legal framework of biodiversity protection in Georgia. In addition to that, the proposals of the NBMS Steering Committee should help to prepare the ground for the implementation of priority actions, e.g. through identification of governmental funds, national fund-raising and through the use of international technical and financial co-operation. Due to organizational changes the NBMS Steering Committee will be partly re-nominated.

g) Access and benefit sharing

Access and benefit sharing are not addressed in NBSAP-1. The Aichi targets include one target which addresses the issue expressly. In reponse to the target Georgia needs to take steps to ratify the Nagoya protocol and to revise legislative, administrative or policy measures already in place or develop new measures in order to meet the obligations set out under the Protocol.

Communication, education and public awareness

Description of the problem in NBSAP-1

NBSAP-1 noted that public awareness of environmental issues generally was low and that knowledge of biodiversity issues among local communities was poor. Governmental, business and public organisations had failed to recognise common interests relating to biodiversity, resulting in a lack of cooperation among those sectors. NBSAP-1 noted the following specific problems:

- Public awareness of environmental issues is low, and precise levels of knowledge have not been formally assessed.
- Knowledge of public rights provided by national and international legislation results in low public participation in decision-making.
- Informal environmental education is unsystematic and fragmented.
- The media shows little interest in the environment and lacks specialist knowledge.
- There are few environmental NGOs in rural areas.
- There is a lack of widespread expertise in environmental law.
- Knowledge of biodiversity issues among local communities is poor.
- Governmental, business and public organisations have failed to recognise common interests relating to biodiversity, resulting in a lack of cooperation among those sectors.
- An integrated biodiversity information base does not exist, to provide improved access to information.
- The 5% limit on free social advertisement at state broadcasting companies is insufficient.

Factors contributing to the low level of public awareness were considered to be:

- Precise levels of knowledge had not been formally assessed (and therefore communication actors lacked a rational basis for designing communication strategies and action plans);
- Informal environmental education was unsystematic and fragmented;

- The media showed little interest in the environment and lacked specialist knowledge in the field of biodiversity.

Action taken and progress made since the adoption of NBSAP-1

Action to increase awareness of the value of biodiversity has been taken in the following directions:

As a result of reforms to learning standards environmental protection including biodiversity now has a much higher profile in the national pre-school (up to six years of age) education programme and in the national curriculum for seven to 18 year olds. The protection and conservation of biodiversity also receive more attention in under-graduate and post-graduate environment science programmes (see annex 1, strategic goal G, activity G15).

There has been a significant increase in the circulation of biodiversity information in rural areas since NBSAP-1 was adopted. For example: since 2009 the Biodiversity Protection Service of the MoEP has conducted awareness raising campaigns – "Garden Birdwatch" and "Species of Red List" - which involve schoolchildren and teachers of state schools; the Agency for Protected Areas and its territorial administrations conduct lectures and seminars for different target groups and trainings and workshops for communities living in an around protected areas; various books, leaflets and short films have been produced.

International experience was used in the development of new school curricula (see annex 1, strategic goal G, activity G15) and is being used in the development of the environmental education programmes implemented by the Ministry of Environment Protection and Agency for Protected Areas.

Significant efforts have been made to strengthen the interest and capacity of the media in Georgia to report on environmental issues (see annex 1, strategic goal G, activity G5).

The Biodiversity Protected Service of the MoEP and the Agency for Protected Areas have carried out various activities to encourage the development of local NGOs (see activity G2 below). "Friends associations" have been established to support a number of protected areas.

Infrastructure in many protected areas has significantly improved since 2005. Many protected areas have well established visitor centres with exhibition halls providing information on protected areas and their biodiversity and where visitors are given lectures on protected areas. Protected areas provide a range of tours, activities, eco-camps, and festivals. Programmes have been developed for different target and age groups. Interpretation desks are installed on tourist trails in protected areas providing specific information to visitors.

Actions carried out in this direction include: training courses and workshops on agricultural biodiversity for various target groups; scientific and popular publications on agricultural biodiversity; production of TV and radio programmes, documentaries and newspaper publications on agricultural biodiversity.

Issues for NBSAP-2

- ***Overview***

Significant progress has been made in the frame of NBSAP-1. However, the biodiversity assessment carried out in preparation for NBSAP-2 noted that the low level of awareness of the Georgian public and policy-makers of the value of biodiversity remains one of the main underlying causes of biodiversity loss. The problem of lack of awareness shows itself in the unsustainable use of biodiversity which is causing degradation of forests and pastures, pollution of inland waters, fragmentation of natural habitats, pressures on endangered species, pressure on protected areas from infrastructure development, and perverse provisions in laws (for example the recent

legalisation of the damaging practise of bottom-trawling in most of Georgia's Black Sea coastal waters).

In spite of the positive results from the awareness-raising activities that have been carried out during the last several years, some experts evaluate the existing tendency very negatively; i.e. it appears that biodiversity conservation has much less priority in Georgia now than in the past and public awareness of the importance of biodiversity remains for low (illustrated by the continuing high level of poaching.

- ***Formal education***

Formal education on biodiversity issues now has a strong structural background (in terms of curricula). However, more needs to be done to have the topic institutionalized in the classroom. Particular attention in this regard should be paid to teacher training and preparation of teaching and informational materials. The internet is by far the broadest and cheapest informational resource, so internet access and proper skills of the teachers and students to use those resources should be ensured. More attention should be paid to teaching sustainable development principles related to biodiversity in higher and vocational educational programmes that have indirect or direct contact with natural resources (specifically agriculture, tourism, production etc.). Agricultural biodiversity issues need to be integrated into general education

- ***Non-formal education***

Non-formal platforms for biodiversity teaching and awareness-raising should be exploited more. The scope as well as quality (how well the biodiversity issues are covered, how the knowledge can be turned into behavioural change) still needs to be improved. The sustainability of non-formal platforms of environmental education should be carefully considered. At present, most of the providers of environmental education are NGOs who will stop provision as soon as the specific project funds are finished. It is important to channel efforts and funds towards capacity building of more sustainable educational platforms such as museums, protected areas, schools and other institutions having educational components.

- ***Informal education***

Informal environmental education is still unsystematic and fragmented, however the Ministry of Environment Protection and Ministry of Education and Science are working on a strategy that will make environmental education more planned and focused on specific goals.

- ***Communication strategies***

Strategies for communicating the value of biodiversity and the importance of protecting and conserving it (including key messages and delivery mechanisms for different target groups) need to be reviewed and revised based on surveys of the level of awareness among different target groups. Social surveys and special studies to determine public awareness for the purposes of more effective communication planning need to be conducted; social networks could be used for this purpose.

- ***Business sector***

The level of awareness of representatives of the business sector (even those whose activities are directly related to the use of biological resources, which have licenses for fishing, timber harvesting, and owners of hunting farms) towards biodiversity protection and conservation issues is low. It would be good to implement trainings and information/awareness-raising campaigns for the above-mentioned target groups.

- ***Decision-makers***

Awareness of the urgency and importance of biodiversity conservation among decision-makers is low (one example which illustrates this point is that recent legislative changes in Georgia made it legal to hunt "Red List" species. Special educational and awareness-raising campaigns need to be conducted for this target group.

- ***The media***

The protection and conservation of biodiversity and socio-economic consequences of losing biodiversity is not an important issue for the media, in spite of the activities of recent projects to increase environmental journalism. Georgian TV channels rarely show popularised scientific films in the Georgian language. Documentary films about Georgia's biodiversity and its importance are shown very rarely (they are broadcast mainly on the "Ertsulovneba" channel). Protection and conservation of biodiversity has never been a popular theme in talk shows.

- ***Capacity***

The Biodiversity Protection Service of the MoEP does not have sufficient human resources and qualified personnel to be able to plan and implement targeted information/awareness-raising campaigns and to assess their effectiveness. Currently the service is supported by the project "Sustainable Management of Biodiversity – South Caucasus", which is being implemented by GIZ. However, it is important that the service will be able to plan and implement public awareness-raising activities.

Annex 1. State of Implementation of NBSAP-1

Strategic Goal A: To develop a protected areas system to ensure conservation and sustainable use of biological resources.

Specific Objectives	Progress
To establish an effective protected areas network	Currently Georgia does not have a protected area network; nor does it have a PA spatial development plan that would provide for the development of the existing protected areas and their transformation into a network. It is critical to transform the isolated protected areas into an interconnected protected area network. Although transformation of existing PAs into a PA network has not been initiated, some steps have been made. New protected areas have been established: Mtirala and Machakehla National Parks, Javakheti Protected Areas (including Javakheti National Park and 5 Managed Reserves) and 21 Natural Monuments. As a result the area of protected areas increased from 431 028.98 ha (6.16% of Georgia's territory) to 519 053,75 ha (7,42% of Georgia's territory). There are still some critical gaps, in particular in the central Caucasus mountain range (the regions of Svaneti, Raja, Lechkhumi and Khevsureti). In the context of the PA network, initiation of the Emerald Network was a significant step forward. However, the so far identified and nominated eight conservation areas, are located within the borders of existing PAs. The political situation, lack of respective legislation and respective capacity is preventing establishment of a comprehensive protected area network in Georgia. There are indications of increased pressures on the PAs because of economic developments. In Kolkheti NP part of a Ramsar site was allotted for construction of the Kulevi terminal; part of Kazbegi PAs were allocated for construction of hydro-electric power station. The country's drive for economic development, in particular the country's hydro-electricity generation and regional development strategies, are preventing progress towards development of the network.
To improve the process of protected areas planning and management	The Ministry of Environment Protection adopted new regulations on the content and process for elaborating PA management plans. However the appropriateness of the document is still under debate by various national and international institutions. Revision of the regulation is needed and is planned. Management plans for four PAs have been prepared

	in accordance with the guidelines; one of them has been formally approved. The APA and its territorial administrations still lack capacity in PA management planning and are overly dependent on international consultants and donor financing.
To improve and/or develop financial mechanisms for protected areas	Georgian budget spending for protected areas has increased in recent years. Establishment of the Agency of Protected Areas as a legal entity under the public law in 2008 facilitated additional fund raising, namely from entry fees from National Parks as well as from concessions. Today APA's revenues make up about 12-13 per cent of its annual budget. Current legislation does not significantly restrict protected areas in terms of diversification of funding sources and implementation of effective revenue mechanisms. However, the legislation should be improved to enhance financial sustainability of the protected areas by giving a clear definition of the PA funding diversification and mechanisms and opportunities of additional revenues for APA. At present contribution of donor organizations in the existing funding is about 50 per cent. The Caucasus Nature Fund is co-financing the running costs of four PAs and plans, together with the APA, increase the number of supported PAs to 2 over the next five years. Some other donors supporting APA are BMU/KfW, UNDP/GEF. The gap between the funding needs of the PA network and actual funding is still substantial and more steps need to be taken to close the gap. The UNDP/GEF project "Catalysing Financial Sustainability of Georgia's Protected Areas" developed a ten-year investment plan for 2012–2022 that should assist APA in identification and attraction of necessary investments in protected areas.
To set up a data base of Georgia's protected areas	The Agency of Protected Area has a database of sorts. The website of APA, particularly the interactive map provides information on PAs. However, there is still no unified electronic database.
To increase the level of political support and develop cross-sectoral cooperation within the Government	Although there have been some notable successes in terms of new and extended PAs since 2005, Georgia's development strategy has increasingly prioritised economic development over the conservation and sustainable use of biodiversity. There is less overall political support for completing a fully representative PA network; cross-sectoral cooperation exists but with the proponents of PAs in a weakened position.
To increase international and transboundary	There has been significant progress in bilateral cross-border cooperation between Georgian and the other

cooperation	countries of the southern Caucasus. The Ministry of Environment Protection of Georgia has signed a formal agreement with the Ministry of Environment and Forestry of Turkey to develop cross-border cooperation between protected areas in western Georgia and eastern Turkey. The Agency of Protected Areas of Georgia and Ministry of Ecology and Natural Resources of Azerbaijan are developing cooperation between Lagodekhi PAs and Zakatala State Nature Reserve with the support of the Transboundary Joint Secretariat for the Southern Caucasus (TJS). Since 2007 the Georgia has been collaborating with Azerbaijan and Armenia in the framework of the TJS; activities have included joint study tours to PAs in EU countries, joint participation in international fairs and exhibitions.
To improve education and interpretation for visitors to protected areas	Infrastructure of many PAs has significantly improved since 2005. Many PAs have well established visitors centre's with exhibition halls providing information on PAs. The visitors are given lectures on PAs. APA together with appropriate PAs has different programmes for visitor. They provide different tours, activities, eco-camps, festivals. The programmes are developed for different target and age groups. Interpretation desks are installed on the touristic trails in PAs providing specific information to visitors.
To develop ecotourism potential within protected areas	Tourism infrastructure has been significantly improved in a number of protected areas that supported increase of ecotourism potential. Since 2005 number of tourists in protected areas has increased 50 times.
To increase the involvement of local communities in the planning and management of protected areas	With regard to cooperation and involvement of local population the PA Law gives the right yet not an obligation to APA to cooperate with local population in making divisions on PA establishment, development, changes in the PA territory and status, management planning, consideration and amendment of administrative acts and other documents. Yet the PA Law does not define respective cooperation mechanisms. Additionally, local community representatives are not represented in the Scientific-Advisory Councils existing at PAs. However, some progress has been made in involving local communities in planning and managing protected areas. The commissions established by the Ministry of Environment Protection to prepare proposals for new PAs (e.g. Khevsureti, Mtirala, Javakheti) include consultations with local communities; the external boundaries and zonation of

	the new Javakheti PAs were planned with the full involvement of local communities, whose representatives participated in the various working groups set up by the planning team. The regulations governing the structure and process of preparing PA management plans include participation by local communities as an essential part of the process; all management plans prepared recently (2010-12) were elaborated with the participation of representatives of the local population.

#	Activity	Indicator	State of Implementation
A1	Prepare a project to develop Georgia's protected area system	Systems plan approved by the Government	Significant steps taken but indicator not achieved. A National Protected Areas System Development Strategy and Action Plan was developed in 2009 and included a ten-year strategy and a five-year action plan. The document was never formally approved.
A2	Establish protected areas in the central Caucasus	Protected areas set up in the central Caucasus Management plans for the protected areas developed and officially approved.	Significant steps taken but indicators not achieved. Two new protected areas - in Racha and Svaneti regions - were identified and planned under the World Bank Protected Areas Development Project in 2008 but no further steps have been taken. Creation of Zemo Svaneti Glacier National Park and protected areas in Pshav-Khevsureti is being planned.
A3	Establish protected areas on the Javakheti Plateau	Protected areas set up on the Javakheti plateau Management plans for the protected areas developed and officially approved.	Significant steps taken but indicators not achieved. Javakheti Protected Areas – consisting of a national park and five management reserves – were legally established in 2011. The management plan was prepared but not approved yet.
A4	Designate new Ramsar sites in Javakheti Plateau (lakes Khanchali, Madatapa, Bugdasheni)	Javakheti wetlands included in the List of Wetlands of International Importance	Significant steps taken but indicator not achieved. Priority wetland areas (Khanchali, Madtapha, Bughdasheni and Paravani lakes and Kartsakhi and Sulda swamps) were identified and respective documents prepared for their inscription on the list of

			wetlands of international importance (Ramsar Sites), and recognized by the Ramsar Secretariat as meeting 3-4 criteria for inscription on the Ramsar site list. The sites are not recognized by the national government yet. Potentially, the reason was some misunderstanding with regard to Lake Paravani that was misinterpreted for the Paravani River, which is an energy resource.
A5	Reorganise existing reserves (including expansion and up-grading into national parks, as appropriate) to improve their effectiveness	At least 3 reserves reorganised	Fully implemented. Saguramo State Reserve became part of the Tbilisi National Park; Kazbegi State Reserve was re-categorised as a national park; a protected landscape was established in part of the Kintrishi State Reserve that had been under traditional agricultural use; Ajameti State Reserve became a Managed Reserve and was expanded. The legal status of the Ktsia-Tabatskuri, Nedzvi and Tetrobi Managed Reserves was redefined in accordance with the 2007 The Law on the Status of Protected Areas, and the status of five hunting farms established prior to independence were reviewed and changed to managed reserves and their areas changed
A6	Improve the effectiveness and management of existing protected areas	Results of evaluation by governmental and public organisations	Significant steps taken. Increases in APA and PAs staff capacity (trainings, workshops, site visits, etc) and investments in infrastructure and equipment helped to improve the management effectiveness of some protected areas.
A7	Identify potential Ramsar sites, and prepare necessary designation proposals	At least one Ramsar site proposal submitted for designation	Significant steps taken See A4.
A8	Develop a list of potential Natural Monument Sites. Draft and adopt laws in support of these sites. Develop management plans for these sites	List of potential sites developed. Relevant laws adopted, and management plans approved	Significant steps taken but not all of the indicators achieved Since 2005 21 New Natural Monuments have been established. A draft law On Natural Monuments was prepared and submitted to the Parliament with the purpose of defining the criteria for a site to be declared a natural monument and to

			harmonise Georgian criteria with IUCN criteria. Together with draft law the list of proposed natural monuments were also submitted.
A9	Designate biosphere reserves	Official designation of biosphere reserves in Georgia	Significant steps taken but indicator not achieved. A study was carried out into the feasibility of establishing a biosphere reserve in Stepantsminda municipality. The study concluded that strengthening the existing Kazbegi National Park was a more appropriate and feasible option. No further steps were taken towards establishing biosphere reserves in Georgia
A10	Compile a list of potential world heritage sites and prepare documentation for their submission to UNESCO	Relevant documents submitted to UNESCO	Significant steps taken but indicator not achieved. A consulting and planning workshop on World Heritage Sites was carried out in Georgia but so far no applications have been made to UNESCO to inscribe natural sites on the list of World Heritage Sites.
A11	Identify potential transboundary protected areas and initiate their establishment	Official agreement with neighbouring countries on the establishment of transboundary protected area	Significant steps taken but indicator not achieved. Formal transboundary cooperation with protected areas in neighbouring countries has not been established so far, though important first steps have been made: there are protected areas on both sides of Georgia's borders with Azerbaijan, Turkey and Armenia (the current political situation precludes transboundary cooperation with Russia) and negotiations about cooperation are underway. The results that have been achieved so far fall short of an agreement to establish transboundary protected areas.
A12	Set up biodiversity monitoring schemes in protected areas	Biodiversity monitoring schemes established in protected areas, and integrated into the national biodiversity monitoring system.	Significant steps taken but indicator only partially achieved. The biodiversity monitoring conducted in protected areas is still not as comprehensive as it needs to be.

A13	Set up protected areas information centre and a database at the Department of Protected Areas	Widely available database of protected areas Various publications on protected areas produced	Significant steps taken but indicators not fully achieved. The Agency of Protected Area created a database, though there is still no information system and no unified electronic database. The APA prepared publications for many PAs and provides detailed information about PAs on its web site.
A14	Prepare an action plan for the protection of large mammal migration corridors and birds flyways	Identified migration corridors designated as protected areas of appropriate category	No significant steps taken. Although no significant steps have been taken towards preparing and action plan the creation and development of the Kolkheti National Park, creation of the Mtirala National Park and Javakheti Protected Areas as well as initiated establishment of the Machakhela National Park should be considered a significant step towards protection of bird migration routes.
A15	Implement pilot projects in buffer (support) zones of protected areas	At least one pilot project implemented at each national park	Some significant steps taken but indicator not fully achieved. A pilot project on sustainable use of natural resources in the support zones of protected areas was initiated. However, the measures that have been implemented so far are not sufficient.
A16	Develop compensation schemes for local people living in or at protected areas	Relevant legal instrument developed to provide compensation	No significant steps taken. Compensation mechanisms for local people living in or around protected areas have not been developed due to problems with relevant legislation and funding.
A17	Improve funding of protected areas by ensuring any funds generated from fines and damage reimbursement are allocated to the protected area budget	Improved (i) financial situation and (ii) infrastructure of protected areas	No significant steps taken. The legal basis for using protected areas' budget revenues received from damage compensations for reinvestment has not been improved. Today the issue should be considered in a broader context of the existing state biodiversity policy and in the context of new regulations; this requires a serious study
A18	Ensure that the income from visitors is allocated to the protected area budget	Improved (i) financial situation and (ii) infrastructure of protected	Fully implemented. Changes were made to legislation to allow payments made by visitors to

		areas	PA administrations to be retained by APA and reinvested in the PA network.
A19	Carry out an inventory of known paleontological sites (Dmanisi, Taribana, Dzegvtahevi, Udabno, Ialguja,etc).	Published database of Georgia's paleontological sites	No significant steps taken.
A20	Develop management plans for paleontological sites that are expected to remain outside protected areas	Officially approved management plan(s)	No significant steps taken.

Strategic Goal B: To maintain and restore Georgia's habitats, species and genetic diversity through *in-situ, ex-situ* and *inter- situ* conservation measures, and through sustainable use of biological resources.

Specific Objectives	**Progress**
To assess the status of species and habitats	The status of rare plant and animal species has been assessed in accordance with IUCN categories and the results have been incorporated in the new Red List of Georgia. There has been insignificant progress with assessing the status of habitats.
To ensure the conservation of the most threatened species and reintroduce extinct species as appropriate and feasible	Some progress has been made towards the objective. Conservation action plans for some of Georgia's most critically threatened species have been developed and implementation of some of the plans has started. A national plan for reintroducing the goitered gazelle into the wild Georgia developed in 2012. The challenge now is to sustain the implementation of the conservation action plans and reintroduction plans that have been developed and to develop conservation action plans for other endangered species. The list of species for which conservation plans need to be prepared should be reviewed taking into account the most up-to-date information available about a species conservation status in the country.
To ensure conservation and sustainable use of biodiversity hot spots located outside protected areas	Some "hot spots" have been identified in the framework of the joint CoE / EU "Programme for the development of the Emerald Network in Central and Eastern Europe and the South Caucasus". However, in Georgia most of the identified hotspots are inside existing PAs. Further studies need to be carried out to identify all

	hot spots outside PAs. No strategies or action plans have been developed for the conservation and sustainable of hotspots outside PAs.
To promote ex-situ and inter-situ conservation	No significant steps taken.

#	Activity	Indicators	State of Implementation
B1	Conduct an inventory of plant and animal species and assess their status using IUCN categories of threat	Conservation status is assigned to at least 75% of estimated threatened species A database of threatened species available on the internet	Significant steps taken but indicator not achieved. The status of rare plant and animal species has been assessed in accordance with IUCN categories and the results have been incorporated in the new Red List; The list of endemic species of the Caucasus Ecoregion (2,950 taxa) has been prepared; out of total species 1,200 have been assessed in accordance with IUCN criteria; Endemic flora of Adjara-Shavsheti has been studied, conservation status of 48 endemic species has been determined and recommendations for their in-situ conservation elaborated
B2	Create a new red list of threatened species and publish a new red data book	Law on red list of threatened species adopted New Georgian red data book produced	Fully implemented. Under the auspices of the Academy of Science of Georgia the National Commission on Endangered Species has been established, which elaborated new Georgian Red List in 2005. The list consists of 197 species, of which 141 are animal species and 56 – plant species; Furthermore, The Caucasus plants “Red List” has been elaborated
B3	Identify threatened plant communities (rare, relic, primary and near primary, globally important, and sensitive communities)	At least 80% of known threatened plant communities assessed and documented	Significant steps taken but indicator not achieved. A draft version of the Regional Strategy on Plant Protection has been elaborated.
B4	Implement conservation programmes for endangered, rare, endemic and relic species	Conservation programmes initiated for at least 20% of key species	Significant steps taken but indicator not achieved. Conservation measures for the species under critical threat have been initiated.

B5	Develop a national recovery programme for goitered gazelles and start its implementation	National goitered gazelle recovery programme approved by the government Implementation started	Significant steps taken but indicator not achieved. In 2009 the goitered gazelle breeding programme in Vashlovani Protected Areas was started. In parallel a national programme for reintroduction of this species is under development.
B6	Develop a Striped Hyena Conservation Action Plan and initiate its implementation	Striped Hyena CAP published and approved by the government Activities started.	No significant steps taken. Faunistic researches conducted in East Georgia have not revealed any sign of the presence of Striped Hyena
B7	Prepare a Cervidae Conservation Action Plan and initiate its implementation	Cervidae CAP published and approved by the government Activities started	No significant steps taken.
B8	Prepare a Caprinae Conservation Action Plan and initiate its implementation	Caprinae CAP published and approved by the government Activities started	Significant steps taken but not all indicators achieved. Conservation plans for both species of Carpinae family (*Capra caucasica, Capra cylindricornis*) have been elaborated.
B9	Prepare a *Leopard Conservation Action Plan* and initiate its implementation.	The Leopard CAP published and approved by the government Activities started	Fully implemented. The conservation plan for leopard was prepared in 2010 and the implementation of its individual components was initiated
B10	Prepare a *Conservation Action Plan for Raptors* and initiate its implementation.	The Raptors CAP published and approved by the government Activities started	No significant steps taken
B11	Prepare a *Conservation Action Plan for Waterbirds* and initiate its implementation.	The Waterbirds CAP published and approved by the government Activities started	No significant steps taken
B12	Conduct a bat inventory and create a *Bat Conservation Action Plan*	Inventory completed for at least 75% of bat species thought to be present The Bat CAP published and approved by the government Activities started.	Fully implemented. A bat inventory has been carried out; Bat conservation plans have been prepared.
B13	Prepare a *Marine Mammal Conservation Action Plan* and initiate its implementation.	The Marine Mammals CAP published and approved by the government	No significant steps taken

		Activities started	
B14	Prepare a *Wolf Conservation Action Plan* and initiate its implementation.	The Wolf CAP published and approved by the government Activities started	No significant steps taken
B15	To develop conservation action plans for other key species (not mentioned above)	CAP's for various key species published and approved by the government Activities started	Significant steps taken but not all indicators achieved: • a conservation plan for the Caucasus Salamander (*Mertensiella caucasica*) has been prepared; • a conservation plan for the Brown Bear (*Ursus arctos*) inhabiting Surami range has been prepared; • conservation plans for the Lesser White-fronted Goose (*Anser erythropus*), the White-headed Duck *(Oxyura leucocephala*), the Eastern Imperial Eagle (*Aquila heliaca* [Savigny]), the Lesser Kestrel (*Falco naumanni Fleischer*) and the Red-breasted Goose (*Branta ruficollis [Pallas] / (=Rufibrenta ruficollis [Pallas])* have been prepared.
B16	Establish bird ringing centres	At least 2 bird ringing centres set up and integrated in international bird ringing schemes	Fully implemented. In 2010, the bird ringing centre was established, the national programme for ringing was prepared, rings produced and over 20,000 birds ringed.
B17	Assess the impact of invasive species and develop management strategies for these species.	Major invasive species assessed, and management plans developed	Significant steps taken but not all indicators achieved
B18	Identify biodiversity hot spots located outside protected areas and define tools for their conservation.	List of biodiversity hot spots published Recommendations for conservation and sustainable use outlined for most important sites	Fully implemented. The list for the Important Biodiversity Areas has been prepared and these areas grouped in accordance with habitats' types; 31 Important Bird Areas (IBA) have been identified in Georgia; 17 areas with the highest conservation value have been identified for inclusion into the Emerald Network (only a few of them are located outside existing PAs)
B19	Complete identification of	All Georgian IBAs approved and	Fully implemented.

	Important Bird Areas (IBAs) in Georgia (including transboundary IBAs) and define tools for their sustainable management	listed in international databases and publications. Management frameworks defined for most sites (including assigning protection status as appropriate) and activities started.	Important Bird Areas (IBAs) have been identified; The majority of IBAs are located within PAs
B20	Conduct a nationwide inventory of wetland ecosystems	Published database and ecosystem maps	No significant steps taken
B21	Develop a National Strategy for Wetlands	National Wetland Strategy	No significant steps taken
B22	Implement the existing Javakheti Wetlands Conservation Management Plan	Officially approved agreement between the neighbouring countries (Armenia, Georgia, Turkey) on a large-scale transboundary project achieved; Funds secured for the project; Implementation started.	Fully implemented. Javakheti Protected Areas is established. There is an official agreement between neighbouring countries on the large-scale transboundary project;
B23	Prepare a national programme on conservation of flood plain forests	National programme on flood plain forests conservation approved by the Government Concrete actions implemented	No significant steps taken
B24	Conduct pastureland inventory and assessment relative to carrying capacity, and out in place measures to promote rehabilitation of degraded pastures.	Most pasture lands categorised and mapped; Optimum grazing levels defined and enforced by relevant legal instruments Pilot pasture restoration activities underway	No significant steps taken
B25	Assess the Surami Range as a biological corridor and define management tools for its sustainable use.	Surami Range management plan published Activities initiated.	No significant steps taken
B26	Assess Gombori Range as a biological corridor and define management tools for its sustainable use.	Gombori Range management plan published Activities initiated.	No significant steps taken
B27	Continue the implementation of the Arid and Semi-arid Ecosystems Management Plan	At least 75% of the activities outlined in the Arid and Semi-arid Ecosystems Management Plan implemented.	Fully implemented. The Arid and Semi-arid Ecosystem Management Plan is being implemented.

B28	Establish a captive breeding conservation centre and strengthen existing botanic gardens.	Programmes to restore and/or strengthen botanic gardens approved At least one of the programmes implemented as a pilot project Captive breeding conservation centre established	Significant steps taken but not all indicators achieved. Seed bank has been created in Batumi Botanical garden to carry out ex-site conservation of endemic species
B29	Assess the plant species subject to international trade and define collection and export quotas for these species.	Internationally traded plant species assessed Quotas for collection and export are defined.	Significant steps taken but not all indicators achieved. Collection and export quotas for the plant species subject to international trade have been determined
B30	Determine harvest quotas for non-game species of wild animals.	Officially approved harvest and export quotas for non-game species of wild animals	No significant steps taken

Strategic Goal C: To conserve Georgian agricultural biodiversity through ensuring its sustainable use and by promoting of *ex-situ* and *in-situ* conservation measures.

Specific Objectives	Progress
To improve capacity for the recovery and preservation of, and research into, agricultural biodiversity	There has been some progress in terms of improving national expertise in agricultural biodiversity conservation and management and strengthening research institutions dealing with agricultural biodiversity research and conservation (see activities C7 and C8 below).
To create an agricultural biodiversity inventory and a red list of Georgian domestic plants and animals	No progress
To conduct research and conservation relating to the wild relatives of native domestic species and varieties	Some research has been implemented by various research groups, especially regarding crop wild relatives
To promote agricultural biodiversity, its products and associated traditions, as well as national and international knowledge of the use of agricultural biodiversity	Some promotional activities have been implemented by NGOs
To evaluate Georgian agricultural biodiversity as part of the national cultural heritage.	No progress

#	Activity	Indicator	State of Implementation
C1	Develop a national agricultural biodiversity conservation	National programme of agricultural biodiversity	No significant steps taken. The Ministry of Agriculture is

	programme with active participation of public organisations	conservation officially approved	not a responsible body for conservation activities
C2	Develop a legal basis for the conservation and wise use of agricultural biodiversity	Georgian biodiversity declared as national cultural heritage; Relevant legislation that ensures conservation of agricultural biodiversity developed	No significant steps taken.
C3	Strengthen the capacity of relevant governmental agencies through (among other mechanisms) provision of specialised training	Professionalism of relevant staff increased; An agricultural biodiversity division established at the Ministry of Food and Agriculture	No significant steps taken. The Ministry of Agriculture is not a responsible body for conservation activities
C4	Conduct an inventory of Georgian agricultural biodiversity, create a Red List of domestic plants and animals and develop concrete action plans for endangered species and varieties.	Red list of Georgian domestic plants and animals published; Action plans for endangered domestic species and varieties created	No significant steps taken. The methodology of the assessment of the vulnerability (need and emergency of conservation) of the CWRs is known by Georgian scientists; In the frame of international projects prioritization is determined for CWRs of field crops of Samtskhe-Javakheti region.
C5	Create a database of Georgian agricultural biodiversity	Easily accessible data base of Georgian agricultural biodiversity established	No significant steps taken. The Gene Bank of the Institute of Farming and the Institute of Horticulture, Viticulture and Oenology of the Agricultural University of Georgia have e-databases for the accessories maintained in their collections, however catalogues of these data basis are not published.
C6	Improve control of export and import of genetic resources, including through the strengthening the capacity of relevant agencies.	Capacity of Georgian customs to control export/import of genetic resources improved	Significant steps taken but indicator not achieved. Movement of living organisms and genetic material is controlled by State Revenue Service
C7	Improve national expertise in agricultural biodiversity conservation and management	Sufficient in-country expertise in agricultural biodiversity conservation and management in place	Significant steps taken but indicator not achieved. In the frame of the different international projects Georgian scientists attended various trainings

C8	Strengthen research institutions dealing with agricultural biodiversity research and conservation.	Capacity of research institutes related to agricultural biodiversity improved	Significant steps taken but indicator not achieved. Gene bank of field crops is operational since 2006 at the I. Lomauri Institute of Farming of the Agrarian University of Georgia
C9	Rehabilitate or improve existing collections, selection stations and seed farms	Availability of agricultural biodiversity genetic resources to farmers and research programmes improved	Significant steps taken but indicator not achieved. The collections of I. Lomauri Institute of Farming of the Agrarian University of Georgia, of Tbilisi, Kutaisi and Batumi Botanical Gardens as well as collections of microorganisms at various research institutes were enriched with new accessories (see above); A non-commercial legal entity "Agro – National Centre of Production of Grapevine and Fruit Planting Material" was established, with rich collection of local fruit and grapevine varieties. Since 2011 the Centre is multiplying and distributing the planting material of local varieties to interested farmers and organizations for free; In the frame of the GEF/UNDP financed project Conservation and Sustainable Use of Georgia's' Agricultural Biodiversity 6 landraces of different species of grain crops, 5 landraces of different species of legumes and as well as 1 landrace of oil producing crop were reintroduced in Samtskhe-Javakheti region. On the demonstration plot of the Project local varieties of grapevine and fruits were collected and are multiplied with the purpose of the distribution of them to the farmers. For legume crops marketing chain developed. In the frame of the project financed by BP and administered by Eurasia Foundation the seed material of

			the local landrace of wheat – Akhaltsikhis (Meskhuri) Tsiteli Doli was multiplied, distributed to the farmers of Samtskhe-Javakheti and marketing chain for the production developed.
C10	Establish a framework for the future development of a national Gene Bank	Framework for National Gene Bank established	Significant steps taken but indicator not achieved. Gene bank of field crops is operational since 2006 at the I. Lomauri Institute of Farming of the Agrarian University of Georgia
C11	Create a data base of endemic and native species and varieties in order to establish national ownership	Endemic and native species and varieties are protected from bio piracy.	Some steps taken. The information regarding the landraces of agricultural crops and domestic animals is scattered in various field survey and study documents
C12	Set up mini-reserves for the conservation of wild relatives of domestic species and medicinal plants	Several mini-reserves established in different areas	No significant steps taken. The area with valuable CWRs where mini-reserves can be established are not defined
C13	Encourage traditional and organic agriculture especially in buffer (support) zones of protected areas and in high mountain areas	Increased share of organic farming in Georgian agricultural production; Number of officially registered organic farmers increased (up to 500)	Significant steps taken but indicator not achieved. 71 producers were certified as organic according to international standards in Georgia in 2011; among them is company Hipp Ltd which is supplied with organic apple by 1103 smallholder farmers (however only one certificate is issued on the name of the organization); “Kula” Ltd one of the main producers of processed fruit and vegetables products in Georgia started to produce organic juices (the number of suppliers is not known); The Georgian NGO, Biological Farming Association Elkana is working on the development of organic farming since 1994 and serves about 600 farmers. Since 2006 organic certification body “Caucascert” Ltd is operational in Georgia. Since 2008

			"Caucascert" Ltd has European accreditation, issued by German accreditation body DAP, and thus is authorized to issue certificates valid in the EU.
C14	Establish a Georgian agricultural biodiversity foundation dedicated to the conservation of agricultural biodiversity, related research and information exchange	Georgian agricultural biodiversity foundation established and rehabilitation of traditional varieties launched on local farms.	No significant steps taken
C15	Promote on-farm conservation of agricultural biodiversity	Local farmers growing at least 10% of endangered varieties of domestic plants	Significant steps taken but indicator not achieved. In the frame of the Project – Conservation and Sustainable Use of Georgia's Agricultural Biodiversity number of legume and grain crops were reintroduced on farmers' fields.
C16	Improve existing legislation to provide access to genetic agricultural biodiversity resources in accordance to the provisions of CBD	Legislation in place to provide access to genetic resources in full accordance with the CBD.	No significant steps taken.
C17	Encourage seed production by local farmers and facilitate seed exchange among them	Relevant changes introduced to the Law on Seed Circulation; At least 3 seed production farms operational	No significant steps taken.
C18	Develop effective mechanisms for information exchange and experience sharing within the country and internationally	Easily accessible information network exists; Web page prepared and placed on internet	No significant steps taken.
C19	Integrate agricultural biodiversity issues into general education	Supplementary textbook on agricultural biodiversity (officially approved by the Ministry of Education) published, and included in the list of compulsory textbooks	No significant steps taken.
C20	Organise training courses and workshops on agricultural biodiversity for various target groups	Workshops and training courses held in at least 3 priority regions	Fully implemented. Various workshops and training were held in the frame of different international projects
C21	Publish scientific and popular literature on agricultural biodiversity	At least 2 publications prepared annually	Significant steps taken but indicator not achieved.
C22	To produce TV and radio programmes, documentaries and	At least 2 TV programmes, 5 radio programmes, 5	Significant steps taken but

	newspaper publications on agricultural biodiversity	newspaper articles, prepared annually; At least 2 documentaries produced within 5 years	indicator not achieved.

Strategic Goal D: To promote sustainable hunting and fishing through adequate planning, restoration and protection of key biological resources

Specific Objectives	Progress
To ensure the maintenance of genetic diversity of game species	No progress
To maintain the populations of each game species at an optimal levels	No progress
To develop effective tools for protection of wild animals and control of poaching.	Some steps taken but then reversed. The establishment of the Environmental Protection Inspectorate under the MoEnv in 2005 was a step forward but the inspectorate was abolished in 2011. Changes to legislation since 2005 have increased the pressure on commercial fish species in Georgia's Black Sea coastal waters and threaten to increase pressure on a number of species which are listed in the Red List of Georgia.

#	Activities	Indicator	State of Implementation
D1	Improve the licensing procedure for hunting of migratory birds	Changes in the relevant legislation officially approved	Fully implemented. According to the Law on Licenses and Permits, no licenses and permits on hunting of migratory birds have been issued since 2005. The interested persons are obliged to pay a tax on hunting of migratory birds to the relevant bank account. During hunting the hunters should have the relevant check, as well as the documents on firearms and ID card. These amendments helped avoid quite an inconvenient procedure of issuing a license on hunting of migratory birds that was triggering huge discontent among the hunters.

D2	Define hunting quotas for migratory birds and conduct studies on hunting (to identify sites where wildfowling will be permitted and those where all hunting should be banned, based on bird counts on these sites)	Hunting quotas and list of sites officially approved	No significant steps taken
D3	Define special (higher) fees for trophy kills	Relevant amendments introduced to legislation	No significant steps taken
D4	Identify the list of birds of prey which can be used in falconry and define quotas for these species.	Relevant amendments introduced to legislation.	No significant steps taken
D5	Restore the former Agency of Hunting Control and set up public inspection schemes.	Legal basis for these changes established	No significant steps taken
D6	Provide professional training to government officers and hunting farm employees.	Numbers of government officers and hunting farm employees show improved skills and knowledge as a result of training	No significant steps taken
D7	Publish leaflets and/or brochures that explain hunting seasons and quotas with special emphasis on rare game species.	Relevant publications prepared and distributed among hunters.	No significant steps taken
D8	Develop the concept of traditional hunting	Additions to the legislation concerning traditional hunting put in place	No significant steps taken
D9	Restore or establish hatcheries dedicated to the recovery of native fish species using modern technologies.	Fully equipped hatcheries using modern fish breeding techniques established.	No significant steps taken
D10	Ensure that income generated from the use of biological resources may be used for conservation and renewal of these resources.	Relevant amendments to legislation put in place	No significant steps taken

Strategic Goal E: To develop a biodiversity monitoring system and an active and integrated biodiversity database to ensure sustainable use and conservation of biological resources.

Specific Objectives	**Progress**
To enhance the legal base for biodiversity monitoring	Two Ministerial Orders on the National Biodiversity Monitoring System (NBMS) have been adopted so far: Ministerial Order (22.05.2009) on the approval of the indicators of the NBMS and their standard forms as well as on the NBMS Coordination

	Committee to ensure the establishment of the NBMS. Ministerial Order (20.12.2010) on the approval of the methodologies of 17 indicators of the NBMS. A draft of a new Ministerial Order, which should replace the above-mentioned Ministerial Orders, has been prepared and was agreed internally in the MoEP in September, 2012. The order should approve all 26 biodiversity indicators, their methodologies and the procedure and rules of the implementation of the NBMS in Georgia. Currently the formal procedures to finalize the adoption of this new order are stopped due to organizational changes.
To strengthen the role of the Environmental Ministry in the field of biodiversity monitoring	The MoEP employed a NBMS Coordinator, who is responsible for the coordination of all steps within the implementation of the NBMS. The NBMS Coordinator is supported by the staff of the Biodiversity Protection Service (BPS) and backstopped by an international expert. The MoEP established a NBMS Steering Committee, which consists of various representatives of governmental and non-governmental organizations as well as scientific and international organizations. On the basis of the monitoring results, the NBMS Steering Committee should develop recommendations for improving the policies and the legal framework of biodiversity protection. A Memorandum of Understanding (cooperation agreement) on sustainable cooperation in the field of biodiversity monitoring in Georgia was signed on 27.05.2011 between the MoEP and the following institutions: - Ilia State University - Ivane Javakhishvili Tbilisi State University - WWF Caucasus - IUCN Caucasus - The Greens Movement of Georgia
To create a regularly up-dated biodiversity data base	In the frame of the data evaluation, a database for each biodiversity indicator of the NBMS has been prepared. These databases are updated on a regular basis. However, not all indicators need to be measured on a yearly basis. Therefore, a specific Biodiversity Monitoring Plan, indicating the monitoring schedule for each biodiversity indicators, will be elaborated.
To provide systematic reports to the general public about the status of biodiversity	The public will be informed about the status of biodiversity through:

	- Annual reports on NBMS, - BioTrends (describing the monitoring results on the individual biodiversity indicators), - NBMS Webpage.
To designate an independent entity responsible for biodiversity data analysis and for the development of recommendations from monitoring.	The establishment of the NBMS is a governmental initiative under the guidance of the MoEP. Within the MoEP the BPS, is the division in charge of the NBMS. On behalf of the BPS, the NBMS Coordinator is coordinating all steps of the implementation of the NBMS. For the calculation of the biodiversity indicators various governmental and non-governmental organizations are providing raw data on a regular basis to the BPS. The cooperation with some of these organizations has been strengthened by concluding cooperation agreements with the MoEP. On the basis of the monitoring results the NBMS Steering Committee should elaborate recommendations for improving the policies and the legal framework of biodiversity protection in Georgia. In addition to that, the proposals of the NBMS Steering Committee should help to prepare the ground for the implementation of priority actions, e.g. through identification of governmental funds, national fund-raising and through the use of international technical and financial co-operation. Due to organizational changes the NBMS Steering Committee will be partly re-nominated.

#	Activity	Indicators	State of Implementation
E1	Improve legislation to provide for clear distribution of functions and responsibilities among relevant institutions;	(No indicator specified)	Fully implemented. Two Ministerial orders (2009, 2010) on biodiversity monitoring have been adopted so far. They will be replaced by a new Ministerial Order, which is currently under preparation. The new Ministerial order will approve all 26 biodiversity indicators, their methodologies as well as the general procedure and rules of the implementation of the NBMS in Georgia.
E2	Designate governmental and non-governmental agencies responsible for the coordination and/or implementation of biodiversity monitoring	(No indicator specified)	Fully implemented. Within the MoEP the BPS, is the division in charge of the NBMS. On behalf of the BPS, the NBMS Coordinator is coordinating all steps of the implementation of

			the NBMS. The position of the NBMS Coordinator was established in 2010. By signing a Cooperation Agreement (Memorandum of Understanding: 27.05.2011) with the MoEP, universities and NGO showed their willingness to contribute in the long-run to a successful implementation of the NBMS. In the frame of the German Technical Cooperation local grant contracts have been concluded to enable organizations to be involved into the NBMS (indicator S6).
E3	Establish (or designate a special entity that will act as) a biodiversity monitoring information centre	Fully equipped biodiversity monitoring information centre set up	No significant steps taken. Due to a lack of space in the MoEP, the first attempt on setting up a Biodiversity Information Centre failed in 2010.
E4	Develop methodological guidelines for biodiversity monitoring with (i) unified methods of data collection, storage and analysis and (ii) identified target components for monitoring	Information on (i) guidelines and approved methods of biodiversity monitoring and (ii) a list of key biodiversity components presented in an official publication of the Ministry of Environment	Fully implemented. For each biodiversity indicator an indicator sheet, including the definition and the significance of the indicator as well as the specific methodology for data collection and data evaluation has been elaborated. All technical and organizational aspects of the NBMS are summarized in detail in a NBMS Manual, which is continuously updated by the NBMS coordinator.
E5	Designate agency(s) with sufficient qualifications and capacity for analysing biodiversity data;	Official designation of agency(s) identified through a tender; Regular reports of biodiversity monitoring giving concrete recommendations.	Fully implemented. The NBMS coordinator is in charge of the analysis of the biodiversity data. In this task the Coordinator is supported by an Integrated CIM Expert and the staff of the BPS.
E6	Strengthen the capacity of responsible agencies with an emphasis on improving the qualifications and skills of key	Qualifications of key personnel of different agencies improved as a result of specialised training; Responsible agencies fully	Fully implemented. The NBMS coordinator is backstopped and supported by an international expert (CIM

	personnel	equipped to implement biodiversity monitoring activities within their responsibilities	expert). In addition to that, the NBMS Coordinator as well as some staff of the BPS participated in training on indicator calculation and evaluation provided by the company Hintermann&Weber, which is implementing the national biodiversity monitoring for Switzerland.
E7	Compile and organise in a single database all existing information on biodiversity gathered and stored by different agencies up to now	(No indicator specified)	Fully implemented. For all 26 biodiversity indicators a specific database, consisting of the raw data and the evaluated data, has been prepared. These databases are updated according to the monitoring schedule of each indicator.
E8	Ensure publicity of the results of biodiversity monitoring through systematic information exchange and reporting to the general public and interested parties	(No indicator specified)	Fully implemented. The results of the NBMS are published by: • BioTrends (BioTrends is a series published by the GIZ Biodiversity Program in close consultation and co-operation with the Biodiversity Protection Service. Through the BioTrends decision makers but also the public should be regularly informed about the indicator based monitoring results. • NBMS Webpage • Annual NBMS Reports
E9	Begin monitoring of key components using official guidelines and methods.	(No indicator specified)	Significant steps taken. The NBMS consists of 26 biodiversity indicators, which have been selected according to the internationally accepted OECD Pressure / State / Response model. The indicators have been identified during several Multi-Stakeholder Workshops which took place in 2007. So far 8 indicators have been calculated 13 indicators are in process of

			calculation 2 indicators cannot be calculated as there are no data available at the moment. Due to a lack of personnel and financial resources the indicator S6 (Species Diversity in Landscapes) cannot be calculated in the near future. However, the methodology for this indicator has been elaborated and already tested on a pilot basis. As the indicators S3 (Population sizes of selected species) and S4 (Population sizes of common birds) are strongly connected with the indicator S6, the survey and the data evaluation also for these indicators currently cannot be ensured.

Strategic Goal F: To protect both the human population and biodiversity from potential threats from genetically modified organisms (biotechnology), through the strengthening the law and through increasing public involvement in decision making.

Specific Objectives	Progress
To a create a sufficiently strong legal basis to address biosafety issues in the country	Between 2005 and 2008 there was significant progress towards the adoption of legislation on biosafety but there activity has been frozen.
To develop effective official and public control mechanisms	No progress
To ensure the transparency of any initiatives involving GM organisms or products	No progress

#	Activity	Indicator	State of Implementation
F1	Prepare for ratification of the Biosafety protocol	Biosafety protocol ratified	Fully implemented. Georgia joined Cartagena Biosafety Protocol on September 26, 2008, by virtue of the Parliamentary Decree.
F2	Prepare a draft law on biosafety and organise public hearings on this	Law on biosafety adopted	Significant steps taken but indicator not achieved. In 2005 draft law On Genetically Modified Organisms has been prepared. Consultations have

			been conducted with international experts and local non-governmental organizations who supplied remarks and recommendations. Though, because of basic legislative and institutional changes that occurred shortly after elaboration of the draft law, certain regulations, procedures and competences of the draft law became incompliant with the legislation in force. In 2008 Ministry of Economic Development prepared draft Decree on Protection of Biodiversity in Georgia, establishing permit and license issuing procedures in accordance with legislation in force. In November 2009, by decree of the Minister of Environment Protection and Natural Resources working group has been established to pursue preparation of legislative framework related to genetically modified organisms (Decree of the Minister of Environment Protection and Natural Resources #i-587, 27/11/2009). By conditions of the decree, the working group should have elaborated draft law on Genetically Modified Organisms by May 1, 2010, though work on updated draft law hasn't yet been completed.
F3	Develop biosafety control mechanisms and designate or set up a responsible agency	Transparent control mechanisms in place; Agency responsible for controlling all risks associated with import, use and release of GM organisms designated or established	No significant steps taken.
F4	Strengthen the national capacity for enforcing biosafety	At least one laboratory capable of detecting content of GM organisms in raw materials as well as in products in existence	Significant steps taken but indicator not achieved. Following laboratories have appropriate GMO detection equipment: 1. Certification Body of the Institute for Horticulture, Viticulture and Wine Making - Testing Laboratory - laboratory

			being accredited with Legal Entity under Public Law - The Unified National Body of Accreditation - Accreditation Centre to carry out GMO analysis 2. Ivane Beritashvili Experimental Biomedicine Centre Genome Structure and Function Laboratory 3. Ivan Javakhishvili Tbilisi State University Exact and Natural Sciences Faculty Biology Department Laboratory However above mentioned laboratories are not fully equipped for quantity and quality detection of GMOs.
F5	Prepare education programmes and organise workshops for different target groups	At least 2 workshops held annually	Significant steps taken but indicator not achieved.
F6	Organise regular TV and radio programmes and press conferences on biosafety	At least 3 TV and 4 radio programmes produced and 2 press conferences held annually	Significant steps taken but indicator not achieved.
F7	Integrate biosafety principles into general education programmes	A supplementary textbook of biosafety produced which is officially approved by the Ministry of Education and is included in the list of compulsory textbooks	Significant steps taken but indicator not achieved. According to National Curriculum, approved of by the Minister of Education and Science Decree #36/B of March 11, 2011, to remain in force till 2016, subjects of modern biotechnology and genetic engineering have been introduced into biology curriculum for intermediary level (10th to 12th grades).
F8	Produce publications on biosafety in the Georgian language	At least 3 publications produced during 5 year period	Significant steps taken but indicator not achieved.
F9	Develop effective mechanisms for information exchange within the country and internationally	Easily accessible information network established; Web page prepared and placed on internet	No significant steps taken
F10	Set up a public biosafety monitoring system	A work plan for biosafety monitoring and relevant indicators prepared by the end of 2004; At least 2 public institutions	Significant steps taken but indicator not achieved. Since 2002 Greens movement of Georgia carries out surveys among food producers and importers in order to find out

		working on biosafety issues.	attitude of different companies towards use of genetically modified ingredients and inform the public upon the findings. Apart from that, the movement, with support of its foreign partners follows developments abroad and spreads information about any hazards through Georgian press. One of the indicators selected within the national system of bio monitoring under construction now, is changes in total amount of imported GMO seeding stock. It is necessary to define measure required to start collecting and processing data.

Strategic Goal G: To raise public awareness of biodiversity issues and to encourage public participation in the decision making process

Specific Objectives	**Progress**
To include biodiversity and sustainable use principles into school curricula.	Objective achieved (see activity G15). The challenge now is to ensure that school curricular are regularly updated in relation to biodiversity and sustainable development.
To increase the circulation of biodiversity information in rural areas.	There has been a significant increase in the circulation of biodiversity materials in rural areas since NBSAP 1 was adopted (see activities G2, G4 and G4a below). However there are many people in rural areas who have not been reached by the information which has been circulated and more needs to be done to communicate with those target groups.
To improve the use of international experience in environmental education.	International experience was used in the development of new school curricula (see activity G15) and is being used in the development of the environmental education programmes implemented by the Ministry of Environment Protection and Agency for Protected Areas.
To increase the role of the media in ecological education and strengthen conservation information dissemination.	Significant efforts have been made to strengthen the interest and capacity of the media in Georgia to report on environmental issues (see activity G5 below). However the coverage of environmental issues in broadcast and printed media is still limited.
To encourage the development of local NGOs focusing	The Biodiversity Protected Service of the Ministry of

on conservation and environmental education.	Environment Protection and the Agency for Protected Areas have carried various to encourage the development of local NGOs (see activity G2 below). "Friends associations" have been established to support a number of protected areas.

#	Activities	Indicator	State of Implementation
G1	Carry out a sociological survey of selected target groups to assess public awareness, understanding of biodiversity issues and knowledge of national and international legislation in the field	Results from sociological surveys indicating the scale and type of work needed to raise public awareness.	No significant steps taken.
G2	Organise an information campaign involving NGO's and local communities especially women and youth.	Information leaflets and brochures published; At least 2 campaigns conducted in each administrative region, all actively involving local volunteers.	Fully implemented. After the 2009 year, under the Biodiversity Protection Service of the Ministry of Environment is conducted awareness raising campaigns – "Garden Birdwatch" and "Species of Red List", which involved schoolchildren and teachers of public schools. In the minor zones of protected areas are conducted meetings with various stakeholders, lectures-seminars for different target and age groups, trainings and conferences for local community to raise their awareness by the Agency of Protected Areas. In the direction of public awareness it is important to conduct public awareness campaign in local and in national level and other activities for protecting and maintaining biodiversity by the non-governmental organization sector WWF the Caucasus representation, CENN, RECC, Nakresi, Georgian Green, Ecovision and other non-governmental organizations.
G4	Produce information materials (publications, videos, etc) on biodiversity and sustainable use.	Information materials (including scientific- popular publications) published; At least two articles published in	Significant steps taken but indicators not achieved In recent years, under the implemented programmes and

		the press each year; Ten videos produced and shown on national and local television channels.	projects had published the information and awareness raising materials on the Georgian biodiversity, including “Beautiful Georgia” the magazine, “Caucasus – Treasure of Nature” the book (CEPF). There have been regularly published different kinds of information and awareness raising material, which are promoted the Georgian protected areas. Movies were filmed on the national Park of Colchis (GEF/WORLD BANK), “Mountain Goat’s Return” and a documentary film of the Georgian protected areas. However, the national and local TV-channels are rarely showing the film. And in general, to protect and preserve the biodiversity, the social and economic consequences of biodiversity lost is still less important issue for the media.
G4a	Produce a series of TV and radio conservation programmes with an emphasis on sustainable use of biological resources.	Series of conservation programmes on state TV and radio produced	No significant steps taken
G5	Organise media-tours and site-visits for increased engagement of journalists with local biodiversity issues.	At least two media-tours per year organised to each region for national and local media representatives	Significant steps taken but indicators not achieved Arrangement of media tours are mainly done by the Agency of Protected Areas. Under the support of CEPF the relevant consultations were made to the journalists who were interested in environmental issues by the Environment Protection Centre. There were conducted 11 trainings, in which were attended 120 journalist, 40 representatives of local government and 45 representatives of NGOs from Georgia and Azerbaijan. Also there were arranged the two

			transboundary media tours. CEPF has supported in Georgia the interesting initiative of Georgian Green Movement, which was directed at the development of cooperation between local government bodies and journalists. Under this Project a network of journalists was established in the two regions of Georgia, as well as there was conducted training for journalist and local authorities.
G6	Improve cooperation between local authorities and the public sector	Relevant facilities set up at the local offices of the Ministry of Environment for regular meetings with local public sector	No significant steps taken. In 2010 the regional branches of the Ministry of Environment Protection were abolished.
G7	Study traditional attitudes towards nature and prepare a popular publication on the subject	Results of desktop and field studies in all regions of the country; Publication on traditional attitudes towards nature in Georgia produced	Significant steps taken but indicators not achieved. Under the support of Georgian Protected Areas Development Project (GEF/World Bank) have been published the brochure about Tusheti traditional activities.
G8	Promote protected areas through a special publication dedicated to (1) the role and importance of protected areas and (2) existing protected areas and (3) future perspectives.	A special publication on the subject produced	Fully implemented. There is regularly published the various kinds of information and awareness-raising materials that are promoted the Georgian Protected Areas.
G9	Set up a nationwide network of fully equipped libraries offering information on biodiversity (publications and conservation films in the Georgian language).	At least 4 fully equipped libraries set up at Regional Offices of the Ministry of Environment	No significant steps taken. On the one hand, the regional divisions have been abolished since 2010, and on the other hand, there was no attempt to create such library in the central level.
G10	Organise environmental events and actions (including quiz shows, competitions, so called “alpiniads” (excursions) with substantial education components.	Environmental actions and events organised throughout the country.	Significant steps taken but indicators not achieved. Organizing spectacular events are made by the Ministry of Environment and as well as by the non-governmental sector and is mainly dedicated to the protection of biodiversity on the

			celebration of international days.
G11	Organise biodiversity workshops for the general public in different parts of the country	At least one workshop held in each region	No significant steps taken.
G12	Organise regular meetings with representatives of the Governmental, public and business sectors in order to encourage multilateral cooperation and identification of common interests	Meetings held annually	Significant steps taken but indicators not achieved. The Public Council is created by the Ministry of Environment Protection, which members are representatives of NGOs, Council meetings are hold regularly. By the initiative of the Ministry of Environment Protection there is also created the "Green Club", which brings together students from different universities. However, the protection of biodiversity-related issues is rarely discussed in these forums.
G13	Set up biodiversity management and conservation training facilities for a wide range of target groups	Facilities for professional training in biodiversity management and conservation established	Significant steps taken but indicators not achieved. At least 11 universities offer subjects that contain biodiversity issues in their various educational programmes.
G14	Provide special biodiversity training for school teachers in different regions of the country	At least 35% of local teachers have participated in the programme	Significant steps taken but indicators not achieved. Since 2009 the teacher training programmes have been going under the education reform. Under the reform there have been developed professional standards for teachers (additional detailed guidelines are currently under preparation) and the teachers were able to pass the trainings in order to improve as teachers as well as the technical skills. These trainings of teachers partially contain the environmental issues. In addition, The Ministry of Environment Protection (and its subordinated institutions – NNLP Agency of protected Areas and Biodiversity Service) carries out certain programmes on biodiversity issues and especially

			for awareness-raising about the protected areas. Their target groups generally are the school teachers of Biology and Geography under a different campaign. But now the size of that campaign is not large (about 120-500 teachers).
G15	Integrate biodiversity principles at all levels of education (pre-school, primary, secondary and higher).	Biodiversity principles integrated into training programmes at all levels of education	Fully implemented. Pre-school education advisory content is defined by the "Early learning and development standards" that was developed in 2010 with the support of UNICEF by the NNLP National Curriculum and Assessment Centre and include five areas of the learning and development (namely, health and physical development, cognitive development and general knowledge, approach to learning, speech development, social-emotional development) for 0-1, 1-3, 3-5 and 5-6 years age groups. The environmental issues are clearly laid out in the standards and include the results of study, which focuses on formation of children's environmental consciousness and positive attitude to the natural environment4. Pre-education programme is based on this standard as well 5, the achievable results under it include five areas of study (including "World Perception"), and the biodiversity issues take a huge place in it. The content of education and learning outcomes related to the environmental and biodiversity issues, on the one hand, are integrated into the national curriculum of competences (the National Education Plan 2011-

4 "Nature and Technologies" one of the sub-issues of the "Cognitive development and general knowledge" means that the Child's ability to understand and study physical environment, to observe, explore, conduct experiments on the processes, which have the visible result. In addition, by the taking knowledge about environment, the child receives the information, e.g. about "The Earth and Living Nature", and with the development of critical thinking the child use this knowledge in practice. (Early learning and development standards, 2010)

5 Pre-school Education Program ISBN 978-9941-0-1521-2 © National Curriculum and Assessment Center. 2011

			2015 came into force in 2010-2011 school year), and on the other hand, it is given and included interdisciplinary into the different subjects of curriculum at all three levels: primary, basic and secondary. The National Curriculum identifies nine priority areas which are integrated into the whole course of general education during teaching the different subjects, which includes "national objectives of general education and requirements of public" and "their knowledge is essential for self-realization and establishing the appropriate place in the modern world". An environmental literacy is one of the abovementioned competencies: " An environmental literacy means development the healthy attitude of person to the environment, which means that student must understand the personal responsibility to the processes going in environment, be able to participate in its protection and restoration"[6] Beyond the competencies environmental education and training courses are mainly consolidated in two blocks of subjects: in natural and social sciences. In the natural sciences block (Natural Science, Fundamentals of Natural Science, Biology, Chemistry, physics) are seven main areas: Living world at the primary stage (Biology introduction), the earth and outside the world (Geography and Astronomy), Man and Environment (fundamentals of Public Education), body and events (elements of the Physics and Chemistry), and as well as at the basic and secondary stages the scientific research, natural

[6] 2011-2016 Curriculum. Chapter VIII. Article 48.

			events (fundamentals of Physics) and chemical effects (fundamentals of Chemistry), the first three of them include information about the issues of biodiversity, threats to biodiversity and biodiversity conservation. Also, 3 of the 11 directions of the Social Sciences (Our Georgia, Geography, Civic Education, safety in emergency situations, etc.) include the biodiversity. The expected change in the national curriculum, in 2012 includes the addition of new subjects into the subject elective block of the national curriculum: "Environment and Sustainable Development", "Natural Monuments Monitoring" and "Conservation Biology". The first contains two modules (I module: "Environment and Sustainable Development", II module: "GeoEcology and Environmental Management"). In the elective courses the great importance has the teaching of biodiversity and conservation approaches (Eka Slovinski, 2012). In Georgia about 11 universities offer different levels of vocational and higher education (professional, bachelor's, master's and doctoral) in the neighbouring specialties of Biodiversity and Environment protection (These programmes have at least one mandatory module on the biodiversity issues).
G16	Develop supporting textbooks on biodiversity for all levels of education (pre- school, primary, secondary and higher).	At least one biodiversity textbook published and officially approved for each level of education.	The question is asked very general. it is difficult to evaluate whether the action is executed.
G17	Create visual education materials (illustrated literature, games, animated films) for the pre-school age group.	Existing materials translated into Georgian; Original materials developed as appropriate including publications, games, films, etc.	No significant steps taken
G18	Set up biodiversity societies (or	As a pilot project several schools	No significant steps taken

	clubs) at schools	with biodiversity societies and equipped rooms	
G19	Organise mobile biodiversity demonstration rooms for regional schools.	Special mobile biodiversity demonstration rooms established; A series of trips to regional schools launched	No significant steps taken
G20	Organise eco-camps for high school and university students.	At least 4 eco-camps organised	Fully implemented. The arrangement of Eco-Camps was supported by the programmes and projects that were implemented in Georgia in the last years, including "The Georgian Protected Ares Programme" (GEF/WB), CEPF. Eco-Camps are regularly organized by the Agency of Protected Areas of Georgia.
G22	Introduce changes into the law on advertisement of Georgia to facilitate greater allocation of TV and radio advertising time to biodiversity problems.	Relevant amendments to the legislation submitted to the Parliament	No significant steps taken
G23	Set up courses in eco-journalism	One major university running a special course in eco-journalism (as a pilot project)	No significant steps taken
G24	Set up courses in environmental law	One major university running a special course in environmental law (as a pilot project).	Significant steps taken but indicators not achieved. "Environmental Law" (elective courses) are taught at the Sukhumi State University (LLM Programme) and at Ilia State university (Bachelor's programme in Law), as well as "International Environmental Law" is taught at Iv. Javakhishvili Tbilisi State University (Bachelor's programme in international law). Also the study of international environment law is scheduled to teach at least at two other universities.
G25	Design a web page about the NBSAP for better publicity	NBSAP web page prepared and placed on the web.	Significant steps taken but indicators not achieved. The condition of the biodiversity strategy implementation is

			assessed in the 4th report of Georgia of biodiversity convention, its electronic version is placed on the following web-site: http://www.chm.moe.gov.ge/index.php?page=konvenciebis_daregva&lng=ge_ It is possible to place more detailed information on this web-site about the conditions of implementing documents obtained during the NBSAP updating process.

Strategic Goal H: To ensure appropriate financial and economic programmes are in place in order to support effective conservation of biodiversity, and to ensure the delivery of the BSAP	
Specific Objectives	**Progress**
To formulate an indicative economic plan for biodiversity conservation, based on international experience, and ensuring regional and local application	No progress.
To bring the budget law and tax law in line with environmental legislation of Georgia, to ensure economic mechanisms such as environmental insurance and eco-labelling are introduced, and that environmentally friendly technologies are promoted.	No progress.
To create additional financial mechanisms to promote biodiversity conservation (taking into account the risk factors facing protected areas, the need for insurance mechanisms to indemnify financial risks, and the opportunity for cross-sectoral debate between state crediting institutions and ministries.	No progress.
To take into consideration the main aspects of biodiversity conservation when formulating economic policies. To assess and value biodiversity in protected areas using new methods and techniques.	Valuations were carried out in two PAs (see activities H4 and H5 below).
To create sustainable economic mechanisms for the conservation of biodiversity.	No progress.
To provide economic incentives for low-waste production methods and for waste treatment.	No progress.

#	Activity	Indicator	State of Implementation
H1	Collect data necessary for the valuation of biodiversity *(including opinion surveys with key stakeholders, identification of primary risk factors and use of internationally accepted methods)*	Reliable, relevant and accessible information available	No significant steps taken
H2	Evaluate the economic structure using macroeconomic and sector-specific strategies	Macroeconomic assessment available	No significant steps taken
H3	Study the impact of economic policies and economic activities on biodiversity	The extent of impacts of economic policies and activities determined	No significant steps taken
H4	Identify and estimate the benefit to major sectors of products and services derived from biodiversity and analyse its use	Benefit derived from biodiversity conservation calculated	Economic valuations of ecosystem services were carried out in Tusheti Protected Areas and Borjomi-Kharagauli National Park in the framework of the TEEB pilot project.
H5	Conduct economic assessment of the consequences of the loss of biodiversity	Damaged caused by loss of biodiversity calculated	Economic valuations of ecosystem services were carried out in Tusheti Protected Areas and Borjomi-Kharagauli National Park in the framework of the TEEB pilot project.
H6	Estimate financial needs for biodiversity conservation based on valuation assessments	TEV calculation completed	No significant steps taken
H7	Plan for biodiversity conservation management based on economic indicators	An economic plan for the promotion of biodiversity developed	No significant steps taken

Strategic Goal I: To further improve national legislation (and associated institutions) relating to biodiversity conservation, through the creation of new, and elaboration of existing laws and regulations, and through ensuring harmonisation to international legal responsibilities.

Specific Objectives	Progress
To adopt new laws and regulations	Various new laws and regulations have been adopted and amendments made to existing legislation since the adoption of NBSAP 1. Some of the new legal acts and amendments have improved the governance of the conservation and use of biodiversity, others weakened governance (e.g. regulations related to bottom trawling and parameters of fishing nets;

	regulations related to hunting of Red List species).
To harmonise national legislation with international law	No significant steps taken
To improve the effectiveness of institutional systems through further elaboration of legal mechanisms (including normative acts on institutional issues)	No significant steps taken

#	Activity	Indicator	State of Implementation
I1	Develop a new law on Vegetation	(No indicator specified)	No significant steps taken
I2	Adopt a law on the Red List of Threatened Species	(No indicator specified)	Fully implemented. Under the auspices of the Academy of Science of Georgia the National Commission on Endangered Species has been established, which elaborated new Georgian Red List in 2005. The list consists of 197 species, of which 141 are animal species and 56 – plant species; Furthermore, The Caucasus plants "Red List" has been elaborated
I3	Develop a law on Agrobiodiversity	(No indicator specified)	No significant steps taken
I4	Develop a law on Ecological Insurance	(No indicator specified)	No significant steps taken
I5	Develop law on Ecological Auditing	(No indicator specified)	No significant steps taken
I6	Develop law on Biodiversity Monitoring	(No indicator specified)	See the tables for Strategic Goal E: (biodiversity monitoring) above.
I7	Prepare and adopt a new law on Forest Privatisation	(No indicator specified)	No significant steps taken
I8	Create legal mechanisms for economic incentives for sustainable use of biodiversity	Normative act the national biodiversity fund developed	No significant steps taken
I9	Create legal framework for the establishment of the national Taxon Advisory Group	Normative act to legally underpin the national Taxon Advisory Group established	No significant steps taken
I10	Create legal mechanisms for harmonisation of national legislation with international law	Presidential order based on which interdisciplinary group will be established at the Ministry of Justice to deal with these issues	No significant steps taken

Strategic Goal K: To conserve forest biodiversity through sustainable forest management

Note: There was no action plan for the conservation of forest biodiversity in NBSAP 1.

Specific Objectives	Progress
To develop sustainable forest policies and management strategy, based on an ecosystem approach	Several drafts of a forest policy and strategy have been prepared since 2005 in the framework of various projects and initiatives by the Government of Georgia; however, none has been formally adopted. Adoption of a forest policy and strategy with participation of all key stakeholders based on an ecosystem approach and sustainability principles remains a priority for the conservation of forest biodiversity.
To introduce forestry regulations and methodology that take into consideration biodiversity issues and the principles of sustainable use To elaborate standards, methods and rules on forest inventory, cadastre, management planning and use in line with sustainable development and biodiversity conservation requirements	Some regulations (for instance logging rules) have been introduced in legislation; however, this is not sufficient for adequate protection of biodiversity. A draft of a national sustainable forest management standard (with principles, criteria, indicators and verifiers) has been prepared for Georgia by a group of experts. Efforts have been made to adopt a new set of forestry regulations and standards that would address biodiversity-related concerns; however, no major progress has been made so far; the standard elaborated by the experts is voluntary and is based on FSC principles and criteria and addresses the needs of biodiversity conservation; it was prepared by a group of experts coordinated by WWF-CauPO and supported by GTZ (now GIZ). Elaboration and adoption of sustainability-based forestry legislation, standards (both mandatory and voluntary) and guidelines designed to safeguard biodiversity conservation remain a priority.
To develop indicators for sustainable forestry management that take into consideration local biodiversity conditions	See the progress reports against the specific objectives immediately above and below.
To establish a forest certification system for the sale of timber from sustainably managed sources	A draft of a national sustainable forest management standard (with principles, criteria, indicators and verifiers) has been prepared for Georgia by a group of experts. The standard is based on FSC principles and criteria and addresses the needs of biodiversity conservation; it was prepared by a group of experts coordinated by WWF-CauPO and supported by GTZ (now GIZ); however, no further steps have been made towards forest certification.

	The standard needs to be endorsed by FSC; in order to promote voluntary forest certification, it is important to formally establish a National Initiative; there is a good scope for cooperation with neighbouring countries in this issue.
To simplify and improve the organization of the timber licensing system and to regulate the forest use fees in a way to increase the financial income from forests, to help develop forest protection and management, and to attract increased financial investments	Based on the Forest Code (1999), long-term wood use licensing was launched in 2007; however, the private and public benefits from this system are still quite limited. The introduced licensing system includes several types of forest use by private companies, including the use of wood for 20, 10 and five years; this new system has experienced a number of difficulties and, as a result, only 5% of the forest fund is managed under the licenses; no progress has been achieved in terms of forest use fees, especially for non-wood products. Further steps that need to be taken are clearer specification of the rights and responsibilities of the license holders; adopting and implementing advanced forestry regulations and standards; to adopt new regulations on forest use fees, taking into consideration the interests of all stakeholders
To establish a moratorium of timber extraction from old growth forests, and those of high conservation value (HCVF) and to use the priority principle with respect to these forests	Although there exist some legal provisions on HCVFs, no detailed management prescriptions (including restrictions of logging in ecologically sensitive areas) have been elaborated and implemented. Further steps that need to be taken are identification and mapping of HCVF and elaborating management prescriptions for these forests; old-growth forests should be assigned a special protection regime; categorization system of Forests Europe could be interesting; this system encompasses protected and protective forests; for the first category, the purpose of management is biodiversity conservation, which is consistent with IUCN I, II and IV categories; the second category envisages the protection of landscapes and special natural features; management objective in the third category is maintenance of protective functions of forests.
To elaborate and implement programs on restoration of degraded forests and reforestation, in order to increase the forest cover and restore forest types, which had been degraded or destroyed.	Only a few reforestation projects have been implemented. In recent years, the state forest authorities could not conduct forest restoration due to the lack of funding; only a few projects on the restoration of natural forest landscapes have been implemented by WWF, GIZ, REC and other organizations on a pilot basis; the total area restored is just a few hundred hectares. Further steps that need to be taken are the elaboration and adoption of guidelines on reforestation and forest transformation (from

	monocultures to close to nature forests with higher biodiversity); adoption of a program on implementation of these measures; making joint efforts to identify funds for the implementation of these programmes.
To establish managed plantations using native species; to prohibit reforestation and afforestation with introduced species.	Practically no plantations comprised of native species and managed for timber production have been established. No adequate legal provisions exist for promoting managed tree plantations of native species (e.g. *Alnus, Populus, Salix etc*); financial resources of the state forestry authorities are limited; the private sector has not demonstrated any significant interests. As an immediate priority - creation of favourable legal and economic conditions to encourage private investments in this field; in the longer term, the establishment of plantations managed by the state