



TEEB
SCOPING STUDY FOR
Georgia

November 2013

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We are also grateful to the Project Advisory Group for its guidance throughout the project (for members of the PAG, see Annex II). Finally, we would like to thank the many stakeholders for their contribution to the two project workshops (for a list of meeting participants, see Annex III).



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Abbreviations

APA	Agency of Protected Areas
BKNP	Borjomi-Kharagauli National Park
CBD	Convention on Biological Diversity
BAU	Business as Usual
BPS	Biodiversity Protection Service
CWR	Crop wild relative
EC	European Commission
ESS	Ecosystem services
EBRD	European Bank of Reconstruction and Development
ECP	Ecoregion Conservation Plan
EIA	Environmental Impact Assessment
EIB	European Investment Bank
ESCO	Electricity System Commercial Operator
GDP	Gross domestic product
GMO	Genetically modified organism
GNEWSRC	Georgian National Energy and Water Supply Regulatory Commission
GNTA	Georgian National Tourism Agency
GSE	Georgian State Electrosystem
HPP	Hydropower plant
HVDC	High voltage direct current
KfW	KfW Entwicklungsbank
IUCN	International Union for Conservation of Nature
MCPFE	Ministerial Conference on the Protection of forests in Europe
ME	Ministry of Energy
MESD	Ministry of Economy and Sustainable Development
MoENRP	Ministry of Environment and Natural Resources Protection
MOA	Ministry of Agriculture
MOU	Memorandum of Understanding
MNP	Mtiral National Park
NBSAP	National Biodiversity Strategy and Action Plan
NTFP	Non-timber forest product
SEA	Strategic Environmental Assessment
SEEA	System of Environmental-Economic Accounting
SEM	Sustainable Ecosystem Management
TEEB	The Economics of Ecosystems and Biodiversity
TPP	Thermal power plants
UNEP	United Nations Environment Programme
WAVES	Wealth Accounting and the Valuation of Ecosystem Services
WWF	Worldwide Fund for Nature

Foreword by Hon. Khatuna Gogaladze - Minister of Environment and Natural Resources Protection, Georgia

The Economics of Ecosystems and Biodiversity (TEEB) Initiative aims at promoting a new economy in which the values of natural capital, and the ecosystem services this capital supplies, are fully reflected in public and private decision-making.

Georgia is a country of the Caucasus Eco-region, belonging to one of 34 globally significant “biodiversity hotspots” identified by Conservation International. So the global importance of the eco-region, the necessity of its protection and conservation is internationally recognized.

The richness of our species and landscape diversity is our treasure and pride. But these resources are not limitless and they need to be cared after and preserved for future generations.

Considering the transitional phase and rapid development in Georgia’s economy, TEEB initiative is exactly one of those effective instruments, which could successfully be applied for preserving ecosystems, and at the same time promoting sustainable growth of the economic sector.

Therefore it was excellent timing to declare Georgia as one of the pilot countries for implementation of TEEB Initiative in 2011.

The present scoping study identifies five core sectors of Georgian economy applicable for the TEEB Initiative; these are Energy, Tourism, Agriculture, Mining, and Forestry. The study highlights the substantial dependence of these driving forces of Georgian economy on natural capital and the services it provides.

Thus the study is an important step forward in valuing natural capital; though it necessarily needs to be followed by a full TEEB National Study to ensure the sustainability of the country’s commitment towards demonstration of strong relationship between economy and environment, and the integration of value of natural capital into national economic policies.

In the end we extend our cordial thanks to UNEP and the whole TEEB Team and look forward to continuing this valuable process of implementation of the Initiative.

Khatuna Gogaladze

Minister of Environment and Natural Resources Protection of Georgia

Foreword by Jan Dusik, Acting Regional Director, UNEP Regional Office for Europe

UNEP is proud to host The Economics of Ecosystems and Biodiversity (TEEB) initiative which has brought the multiple values, including the non-monetary values, of the globe's ecosystems and their services from the invisible into the visible spectrum of economic and developmental discourse. Not because the economics of nature are nature's only relevance to humanity -but in a world where the ups and downs of GDP currently define much of policy-making, bringing the wealth of the natural world to the attention of ministries in charge of finance and development may pave the way to better informed choices and policies for the environment.

Georgia took the initiative to become a pilot country and has participated in the preparation of this TEEB Scoping Study as a first step to demonstrate the value of its natural capital. And indeed many other countries in the pan European region wish to work with UNEP and other partners to implement TEEB-related activities. This is evident in the Pan-European 2020 Strategy for Biodiversity which includes activities to assist in the achievement of the Global Aichi Biodiversity Targets of the Strategic Plan for Biodiversity 2011-2020. Assessing and taking into account the economic, social and cultural value of ecosystems and biodiversity can play a key role in efforts to achieve these international biodiversity targets.

Georgia also kindly hosted the 6th Intergovernmental Conference Biodiversity in Europe (Batumi Conference) from 15 to 18 April 2013, which was recognized by many countries for its successful outcomes and momentum for biodiversity cooperation in the region. They discussed how the Pan European Biodiversity Platform could contribute to: the TEEB, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, the Biodiversity Indicators Platform, the MEA Information and Knowledge Management Initiative, the National Biodiversity Strategy and Action Plan Forum and the global biodiversity synergies work.

UNEP is certain that the TEEB Scoping Study for Georgia will inspire action within the region and support for the preparation of a full TEEB National Study in Georgia. This will further bring biodiversity and ecosystems from the margins into the centre of Georgia's political and financial decision-making processes.

Jan Dusik

Acting Regional Director,
UNEP Regional Office for Europe

Foreword by Yolanda Kakabadse, President - WWF, and Pavan Sukhdev, Chair - TEEB Advisory Board and UNEP Goodwill Ambassador

Georgia is a country rich in natural resources and biodiversity – it has been listed as a terrestrial eco-region and is part of two global hot-spots for biodiversity. Georgia is also an emerging economy that is on a path of growth and development.

Although development and environment have often been termed as being trade-offs the choices are not necessarily that opposed. Indeed, as this preliminary TEEB scoping study shows, nature plays a vital role in sustaining Georgia's important economic sectors and policy priorities. For example, with its abundance of rivers and varying terrain, the hydropower sector has immense potential for not only meeting domestic energy needs but also export. The sector however depends on both quality and quantity of freshwater guaranteed by forests upstream. The Agriculture sector employs nearly half the population of Georgia and it too depends on nature – relying on nutrient cycling and pollination services of insects and bees to produce food.

At the same time, this study highlights adverse impacts of these economic activities on Georgia's ecological base. For instance, unplanned growth in tourism has led to habitat loss, increased waste generation and impaired water quality; intensive agricultural practices have led to reduction of genetic diversity, and land degradation; and forest degradation has adversely impacted rural communities who rely upon forest goods and services for their lives and well-being.

These impacts and dependencies paint a complex picture, and cast doubts over the long-term sustainability of these sectors. Can we have growth in the agricultural sector if land degradation continues to increase? Can hydropower fulfill Georgia's long-term energy needs if water quality continues to decline?

What is at stake here? How is nature essential to Georgia's economic and social development? What changes can be made to business as usual and how will these reduce sectoral impacts on nature? What are the incentives that can lead this transformation? These are some of the questions that can be answered by a TEEB Country Study.

The government of Georgia has shown immense leadership and foresight by choosing to become a pilot country for TEEB. This scoping study is an important piece and lays the groundwork for undertaking a full TEEB study, which we hope will commence soon.

Yolanda Kakabadse

President - WWF
Member, TEEB Advisory Board

Pavan Sukhdev

Chair, TEEB Advisory Board
UNEP Goodwill Ambassador

Executive summary

- 1.0 Georgia is located in the South Caucasus region, bordering the Russian Federation in the north, Republic of Turkey and Armenia to the south, Azerbaijan to the east and the Black Sea to the west. Due to its diverse relief and climatic zones, Georgia is rich in biodiversity and hosts a high level of endemism (IUCN, 2012). The Caucasus, including Georgia, is on the list of 200 global terrestrial ecoregions of the WWF. Based on richness of biodiversity and related threats, 34 biodiversity hotspots have been identified in the world today and, of these, Georgia is part of two (Mittermeier et al, 2005).
- 2.0 Georgia has prioritized the environmental protection and sustainable use of its natural resources in its various national programmes, including the current Government Program for Strong, Democratic, United Georgia, endorsed by the Georgian Parliament in October 2012. As a Party to the Convention on Biological Diversity (CBD), Georgia prepared a Biodiversity Country Study (1996), a National Biodiversity Strategy and Action Plan (NBSAP) adopted in 2005, and in 2005-2010, Georgia submitted the second, third and fourth national reports to the CBD. Following the adoption of Strategic Plan for Biodiversity 2011-2020, the Ministry of Environment and Natural Resources Protection (MoENRP) of Georgia took the first steps towards the preparation of an updated National Biodiversity Strategy and Action Plan (NBSAP) to reflect the vision and mission of the Strategic Plan for Biodiversity including Aichi Targets (NBSAP-2, to be adopted in 2013).
- 3.0 In the pan European regional context, conservation and sustainable use of biological diversity and incorporating the values of biodiversity, ecosystems and ecosystem services are key priorities. The Pan European 2020 Strategy for Biodiversity promotes the use of new tools in the region to assist policymakers in decision-making and help achieve “an improvement in the outlook for biodiversity, ecosystems and the provision of goods and services to 2020 and beyond” (UNEP, 2012).
- 4.0 TEEB aims to inform policy making at national levels by increasing the evidence base for countries to account for their natural assets in decision-making and policy formulation. In the operating space of public policy, TEEB recommendations cover a large spectrum, including public policies for subsidy reform, land use management, protected area management, investment in natural infrastructure restoration, and national accounting to include natural capital. These generic recommendations are being tailored and taken forward at the country level by “TEEB Country Studies”. TEEB Country Studies are in-depth examinations to identify ways to ‘work with nature’ to meet specific policy priorities and thematic concerns of the country; within a ‘TEEB Country Study,’ ecosystem services that are vital to meeting the country’s policy priorities are identified, and examined in detail to be internalized into the policy process.
- 5.0 The Government of Georgia proposed to become a pilot country for a study to be carried out during the implementation phase of The Economics of Ecosystems and Biodiversity (TEEB) as part of its national assessment work. This was supported in the international and national environmental policies mentioned above and in particular the CBD Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets, and the Pan-European 2020 Strategy for Biodiversity (2012). Georgia’s 2005 NBSAP recommends “mainstreaming nature’s value in decision making” to ensure appropriate financial and economic programmes are in place to support effective conservation of biodiversity, and to ensure the delivery of the NBSAP activities. Furthermore, the “Assessment/Valuation and Sustainable Use of Biological Resources” has been identified as one of the eleven thematic components of NBSAP-2.
- 6.0 This report is a first step towards a full TEEB for Georgia study. It aims to scope both thematic and policy questions that a full TEEB for Georgia would answer. To that end, this scoping study – takes stock of work that has been done thus far on biodiversity and ecosystem services assessments in Georgia; prioritizes important economic sectors and highlights critical relationships to biodiversity and ecosystem services (for four of these sectors)¹; formulates important questions that may be answered

¹ While this scoping study presents analyses of four sectors, the scope of the full TEEB study has been extended to cover five sectors to account for stakeholder inputs.

by a full TEEB study; and provides an implementation roadmap for undertaking a full TEEB study in Georgia. It is also expected that the dissemination of the outcomes of the Georgia TEEB Scoping Study will encourage further TEEB national assessment studies to be carried out in the pan European region.

- 7.0 Sectors have been prioritized by taking account of various policy programmes of the government of Georgia and inputs from policymakers. These sectors have also been chosen to maximize synergies between TEEB work in Georgia and thematic components identified under Georgia's NBSAP². These sectors are energy, forestry, agriculture, mining, and tourism. Georgia's current government programme entitled "For Strong, democratic, United Georgia," explicitly identifies sustainable use of land resources and development of agriculture as priorities. The forthcoming NBSAP- 2, currently in preparation, identifies protected areas, agricultural biodiversity, and biodiversity of forests as three of its eleven thematic components.
- 8.0 This report provides analyses of four of these five priority sectors in the form of (i) a description of the current state of the sector; (ii) governance – which governmental agencies and other stakeholders influence formulation and adoption of policies; (iii) the sector's impact and dependencies on biodiversity and ecosystem services; (iv) description of alternative policy/policies and their impacts on ecosystem service provisioning; and (iv) sector-specific conclusions questions for the full TEEB Country Study.
- 9.0 The Hydropower sector has increasingly gained importance in Georgia's national policy. The Strategic "10-Point Plan" of the Government of Georgia for Modernization and Employment states "The task of Georgian Government is to satisfy 100% of the country's demand for electricity by hydropower produced in Georgia. Georgia is to become an important exporter of electricity to Turkey, Europe and Middle East." In this context, by the end of 2012, memorandum of understanding agreements between the Government of Georgia and various investors were signed for construction of 5 large (capacity greater than 100 MW), 28 medium (10-100 MW), and 12 small scale (capacity less than 10 MW) hydropower plants. Of these, fifteen are under construction.
- 10.0 While hydropower is a renewable resource, it both depends on and impacts upon ecosystem services and biodiversity. It depends on a regular supply of water; both quality and quantity of freshwater is critical for the functioning of this sector. Some of the impacts of the hydropower sector include habitat loss, displacement of local communities and emissions. These impacts however are not always appropriately addressed in current environmental assessments of hydro power plants. To this end, a TEEB study to inform the environmental impact assessment processes may be undertaken to inform Georgia's broader energy policy by considering the environmental and distributional impacts of the Georgian energy sector, and how these impacts might be mitigated through mechanisms such as biodiversity offsets. Furthermore, this work would strengthen the impact assessment goal echoed in Georgia's current government programme "For Strong, democratic, United Georgia"; it states "a modern principle-based system of strategic assessment of environmental impact and environmental monitoring" will be put in place.
- 11.0 Tourism has been a steadily growing sector of the Georgian economy. According to the National Statistics Office of Georgia, total output of tourism related services increased by 73.5% between 2006 and 2011, and amounted to 7.1% of the country's total economic output. Furthermore, tourists to protected areas have increased by fifty fold in the same period.
- 12.0 While there are quick revenues to be generated from the tourism sector, various adverse impacts of tourism on ecosystems have been observed. Some of these include: habitat loss due to land encroachment, waste generation, and water quality impacts. Moreover, some of these adverse effects from uncontrolled expansion in tourism may negatively impinge upon the tourist experience (e.g. untreated sewage affecting bathing water quality; soil erosion from off-road vehicles making pathways and roads impassable; draining coastal wetlands which can increase the prevalence and intensity of

2 This has been expressed during the stakeholder workshop conducted on **26 February 2013 in Tbilisi, Georgia**

storm events; unregulated waste disposal implying plastic litter in otherwise pristine nature spots). A TEEB study for sustainable tourism in Georgia therefore may be undertaken to better inform tourism planning and development (zoning, protected area management), and to identify opportunities and threats for long-term sustainable tourism.

- 13.0 Agriculture has been identified by the Government of Georgia as a main vehicle for rural development. The current government programme, "Government Program for Strong, Democratic, United Georgia", states that "Development of agriculture will be one of the main priorities of the government of Georgia, which will be guaranteed by clear rural and regional policy and increasing of financing of agriculture."
- 14.0 However, within agriculture, reduction of genetic diversity, land degradation due to salinization and soil erosion are some of the many issues that challenge the long-term sustainability of the agricultural sector. Hence there is a risk of reducing long term crop yields if incentives are not provided to promote, for example, limited pesticide and chemical fertilizer use, biological pest control, soil conservation techniques, water use efficiency, food safety, crop rotation, and farm diversification. A TEEB on Agriculture for Georgia, a sectoral examination, may be undertaken to inform agricultural policies in Georgia to ensure food security, improve agricultural biodiversity, and reduce the extent of land degradation. This work would complement the thematic component on agricultural biodiversity of the forthcoming NBSAP-2 and will also be aligned with Georgia's "Government Program For Strong, Democratic, United Georgia", that states "...obligatory labelling of finished genetically modified products will be introduced, preservation of local cultural varieties will be promoted, as well as development of organic farming..."
- 15.0 Forests cover around 40% of Georgia's territory and are a source of livelihoods for the rural population. Furthermore, they provide habitat for a significant number of fauna and flora species of Georgia. The current government programme states "...The mechanisms of sustainable use of land resources will be worked out, for soil erosion reduction, prevention of desertification and preservation of soil fertile layer; the complex of actions required for protection and maintenance of biodiversity will be performed, modern methods will be implemented in forestry ..." Furthermore, at the Pan European level, the 2020 Strategy for biodiversity identifies forests as one of the thematic actions that need to be taken as part of to prevent further loss of biodiversity in the pan-European region, in line with the global biodiversity targets (UNEP, 2012).
- 16.0 Forests however are under threat from unsustainable logging, overgrazing and land encroachment. These actions often adversely impact rural communities who rely on forest services such as firewood, non-timber forest products, habitat services, and freshwater. A TEEB for sustainable forestry management may be undertaken for Georgia, identifying ways to maximize the benefits of forests through measures such as sustainable forestry, zoning, and changes in land tenure arrangements. This work would strengthen the private ownership related goals of the current government programme "Government Program For Strong, Democratic, United Georgia" which states, "At the first stage, legal status of every community (village, settlement, and town) will be determined. Land (arable lands, pastures, and forests), water, and real estate, necessary for existence and development will be transferred to them into ownership" Furthermore, the upcoming NBSAP - 2 identifies forest biodiversity as one of the eleven thematic components which may also be aligned with this work.
- 17.0 Another sector that may be undertaken as part of the full TEEB study is mining. Georgia has various mineral deposits of manganese, gold, copper, arsenic, barite, benitonite, diatomite, and others. The majority of these deposits are of national and international importance (Ministry of Energy, Government of Georgia). Furthermore, the "Government Program for Strong, Democratic, United Georgia" identifies rational use of natural resources as a policy priority. While mining has brought revenues to Georgia, it has also resulted in adverse impacts on water and soil quality. Furthermore, both soil and water qualities are important priorities for the ministry of environmental protection. According to current Georgian legislation, mining is not a subject of environmental impact assessment

but stakeholders have expressed a strong interest in this sector. While mining is not part of the sectoral analyses presented in this scoping report, it may be undertaken as part of the full TEEB study.

- 18.0 A full TEEB study for Georgia therefore may be composed of five sectoral reports. Three of TEEB's eleven recommendations suggest mainstreaming of natural capital, namely, making nature's values visible, assessing value of ecosystem services and integrating these into decision making, and measuring better to manage better. To this end, some work with natural capital initiatives that implement these recommendations in a systematic way, such as WAVES³, may also be undertaken. A synthesis report presenting a summary of findings and recommendations may also be part of a further TEEB project in Georgia.
- 19.0 The governance for such a project may be undertaken through a steering/ advisory group which would take decisions to guide the study, ensuring that the project is delivered to meet its agreed objectives. The steering group may have representatives from donor agencies and from line ministries. For Georgia, the existing PAG with representatives from the various line ministries may fulfil the roles of the steering group with a renewed mandate for overseeing future TEEB activities. An Expert Panel may also be established to lead in the design and review of technical aspects of the study. This type of group can provide specific input (scientific, policy, and stakeholder), quality assurance, help develop key messages and facilitate outreach and communication to the scientific community. Author Teams to undertake technical work of the study may be nominated or hired through a competitive bidding process. Authors can come from a range of agencies and may include government departments/ ministries, independent consultancies, universities and other academic organizations. Lastly, a mix of national and international peer reviewers may be selected to revise and review the study. It may also be useful to have review editors with expertise in each of the five sectoral reports suggested in this scoping study.
- 20.0 Depending on availability of resources and government decisions, a full TEEB for Georgia study may be initiated. As a first step to carry out a full TEEB study, a steering/ advisory group composed of a representational group of stakeholders may be established. Subsequently, financial estimations, identification of interim deliverables, timelines, and key donors may be carried out for both fundraising and selection of author teams. Once funding is secured, the author teams may be selected through a request for proposal or expression of interest process. TEEB draft reports may undergo peer review locally and internationally and a communication strategy to disseminate results may also be developed and implemented. Lastly, the study may be officially endorsed by the international TEEB initiative through a review organized by UNEP-TEEB Office.

PART I - Background

This document titled 'TEEB Georgia: Scoping Study' is a preliminary study that sets the stage for undertaking a full TEEB study for Georgia. A full TEEB study for Georgia would provide decision makers with data and recommendations on questions that this scoping study identifies. To that end, this scoping study – takes stock of work that has been done thus far on biodiversity and ecosystem services assessments in Georgia; prioritizes five important economic sectors and formulates policy questions that may be answered by a full TEEB study in the context of these sectors; and provides a roadmap for undertaking a full TEEB study in Georgia.

The study has been commissioned by UNEP to support a TEEB Country Study for Georgia. It is a multi-agency effort and is meant to inform future TEEB efforts in Georgia that are both echoed in Georgia's domestic - and international - environmental policy (Box 1)

3 Wealth Accounting for Valuation of Ecosystem Services is a World Bank Project. Refer to Annex VII (Also refer to Guidance Manual for TEEB Country Studies, Version 1.0, 2013 for linkages between TEEB, WAVES, and SEEA).

Box 1: Policies echoing TEEB for Georgia	
Georgia's National Biodiversity Strategy and Action Plan (NBSAP) which was adopted in the year 2005 (Prime Minister's Decree N 27, 19.2.05). ⁴	<p>"Furthermore, at present, few efforts have been made to assess the economic value of biological diversity in Georgia, and to express its usefulness in financial terms, which will be necessary to underlie appropriate pricing for environmental services and damage." (NBSAP - Georgia, 2005)</p> <p>"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" (NBSAP - Georgia, 2005)</p> <p>"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 - H1 - <i>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)</i>" (NBSAP - Georgia, 2005)</p>
Pan-European 2020 Strategy for Biodiversity	Promotes the use of new tools in the region to assist policymakers in decision-making and help achieve "an improvement in the outlook for biodiversity, ecosystems and the provision of goods and services to 2020 and beyond" Action 7 of the action plan that explicitly recommends TEEB ⁵ to account for natural capital and ecosystem services for decision making
Aichi Biodiversity Targets	<p>In particular Targets 2, 3, and 11 (Rode et al, 2012) under Strategic goal A and C ("Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society"; and "To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity")</p> <p>(i) Target 2 <i>"By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems."</i></p> <p>(ii) Target 3 <i>By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic condition;</i></p> <p>(iii) Target 11 <i>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</i></p>

More recently, in 2011, the Ministry of Environment and Natural Resources Protection (MoENRP) Georgia took the first steps towards preparation of an updated National Biodiversity Strategy and Action Plan to reflect the vision and mission of the Strategic Plan for Biodiversity 2011-2020, including aforementioned Biodiversity Aichi Targets (Box 1). Eleven themes have been developed under the forthcoming NBSAP-2. These include Conservation of species and habitats; Protected areas; Agricultural biodiversity; Assessment and sustainable use of biological resources; Biosafety; Public participation and education; Biodiversity and climate change; Management and governance of biodiversity; Biodiversity of forests; Biodiversity of inland waters; and Biodiversity of the Black Sea (Ministry of Environment and Natural Resources Protection, Government of Georgia).

4 As a Party to the CBD, Georgia has prepared a national document outlining its future policy and plans to meet its responsibilities under this Convention to protect biodiversity, to ensure its sustainable use and to enable fair access to the benefits of biodiversity (as per Article 6(a) of the Convention).

5 "The Economics of Ecosystems and Biodiversity (TEEB): Placing a value on natural capital, including biodiversity and ecosystem services, through a range of economic tools and policies to take proper account of this value."

Additionally, various other projects have been carried out that have contributed to the ecosystem services discourse in Georgia. These include recognition and valuation of services derived from national parks and protected areas such as Borjomi-Kharagauli, Mtiralala and Tusheti national parks. Furthermore willingness to pay studies have been conducted to explore ascertain tourist preferences and revenue generation potential of protected areas (Annex I). Studies like these can certainly inform public policies for effective management and governance of natural resources in Georgia.

It is in this context that a TEEB process for Georgia has developed. It has been informed by the involvement of key stakeholders and policies in Georgia. It has taken cognizance of the work that has been done thus far on bringing biodiversity and ecosystem services into decision-making, and seeks to complement that work. The process for this study was initiated by the Georgian government expressing interest for Georgia to become one of the pilot countries for undertaking TEEB. WWF-Caucasus, in association with the Ministry of Environment Protection of Georgia, and UNEP, conducted an inception workshop “Development of a TEEB Scoping Study for Georgia” in Tbilisi, Georgia on 28 May 2012. In order to provide maximal involvement in the project and increase the level of process ownership it was decided to establish a Project Advisory Group (PAG) completed by officials from line-ministries, science, business and NGO sector (Annex II). The first meeting of PAG was conducted shortly before first initiation workshop of stakeholders “Development of a TEEB Scoping Study for Georgia” in May 2012. The PAG meeting and the initiation workshop resulted in an agreed structure for the scoping study to be conducted during 2012. The Group conducted similar meeting before arranging the second workshop of stakeholders which was dedicated to the presentation of the draft document and discussions on its structure, possible gaps and the way forward in February 2013 (list of attendees attached in Annex III).

Outline of the report

The report is organized as follows:

Part I: Background: TEEB for Georgia

This section provides an overview of environmental policies that relate to TEEB, and describes the TEEB process in Georgia.

Part II: Introduction: TEEB for Georgia

This section provides an introduction to TEEB and the role of this scoping study in the TEEB process for Georgia. It also outlines the methodology and analytical framework adopted for this scoping study.

Part III: Context

Part three of the report provides a brief biophysical and economic overview of Georgia. It highlights the significance of biodiversity in Georgia and also presents the various threats posed to these natural resources.

Part IV: Sector analyses

This section presents sectoral analyses for four of Georgia’s important economic sectors – hydropower, forestry, agriculture, and tourism. It identifies current policy regimes that govern these sectors, and the stakeholders involved in management thereof. It also allows the reader to see the relationships of the sectors to identified biodiversity and ecosystem services, and how these relationships may change under alternative management regimes.

Part IV: Conclusion and way-forward

This section summarizes some of the findings of the scoping study and presents a way forward for undertaking a TEEB for Georgia. It also presents potential next steps were a full TEEB study to be commissioned for Georgia, with a project governance architecture to manage the same.

PART II - Introduction: TEEB for Georgia

2.1. TEEB

The Economics of Ecosystems and Biodiversity (TEEB) is an international initiative to draw attention to the benefits of biodiversity. The German Federal Ministry for the Environment and the European Commission (EC), with the support of an Advisory Board, initiated work on TEEB in 2007. As a result, four reports targeting various end users have been produced (TEEB Ecological and Economic Foundations, 2010; TEEB in National and International Policymaking, 2011; TEEB in Local and Regional Policy and Management, 2012; and TEEB in Business and Enterprise, 2012). In addition to these, a TEEB synthesis report and a campaign for citizens and consumers have also been developed. While the reports were published over 2010-2012, the synthesis and recommendations were presented at CBD COP-10.

TEEB presents an approach that can help decision makers recognise, demonstrate and, where appropriate, capture (e.g. via regulation, zoning, or creating markets) the values of ecosystems and biodiversity (TEEB, 2010). TEEB however is not simply economic valuation of ecosystems. One particularly important aspect of TEEB is to highlight the importance of public goods and public values (e.g. clean air, climate, landscape) and ensure that these are fully accounted for in any analysis of land-use or wider resource use decisions. Moreover, social and cultural values form an important part of the TEEB approach. For instance, in some cases, qualitative indicators are the only possibility and indeed sufficient to inform decisions, such as, stakeholder values on cultural or spiritual importance of a site. In other cases, monetary terms can prove useful in decision-making. These may include, economic savings from avoided soil erosion, designing of PES; communicating with Ministries of Finance and Economics. (Guidance Manual for TEEB Country Studies, Version 1.0, 2013).

To this end, an increasing number of countries have initiated projects to implement TEEB findings and recommendations (Box 1) in policy processes at specific regional, national or sub-national levels.

Box 2: The recommendations of the original TEEB Study include (TEEB Synthesis, Chapter 4):

- **Make nature's values visible** by assessing and communicating the role of biodiversity and ecosystem services in the economy and to society.
- **Assess the value of ecosystem services and integrate these into decision making** - improving the evidence base for decisions.
- **Minimise risks and uncertainty** -by understanding them and applying safe minimum standards or precautionary principles.
- **Value the future** - by looking at sufficiently long timescale and using appropriate discount rates.
- **Measure better to manage better** - investing in improved indicators and national accounts that take account of the roles and value of nature.
- **Work with nature for poverty reduction** - identify synergies between nature, livelihoods and wellbeing and target investment in public goods.
- **Encourage corporate disclosure** that goes beyond the bottom line and encourage due action and compensation for adverse impacts that cannot be avoided - ensure no net loss, aim for net positive impact and disclose externalities and liabilities.
- **Change the incentives** - reform harmful subsidies, encourage full cost pricing, make use of taxes and charges, fees and fines, and develop markets, where appropriate.
- **Designate, manage and invest in protected areas** - to ensure a comprehensive, representatives, effective and equitably managed network.
- **Invest in ecological infrastructure** - to support climate change mitigation and adaptation, water security and other policy goals.
- **Mainstream the economics of nature** - into different ministries and sectors e. g. in economy and finance, trade and development, transport, energy and mining, agriculture, fisheries, forestry, planning and water.

There may be various outputs of a TEEB process at the national level. These may include, but not be limited to, a TEEB scoping study, a full TEEB Country Study, TEEB synthesis of policy recommendations, other interim reports, and a monitoring and evaluation plan for recommendations. A 'TEEB Country Study' is a major output of the TEEB process. TEEB Country Studies are in-depth examinations for identifying ways to 'work with nature' to meet specific policy priorities and thematic concerns of the country. In the process of conducting a TEEB study, a scoping study is recommended to define the scope of the full TEEB study (Guidance Manual for TEEB Country Studies, Version 1.0, 2013). The following section describes the objectives of a scoping study and the outcomes of this particular scoping study for Georgia. It also provides an overview of methodology employed by this study.

2.3 TEEB Scoping Study: objectives and methodology

2.3.1 Objectives

The objectives of this scoping study for Georgia are closely aligned with objectives (Annex IV) identified in the Guidance Manual for TEEB Country Studies, Version 1.0, 2013. A TEEB scoping study does the following (highlighted in bold). Each of these is followed by what this document does to that end:

1. Identifies objectives and thematic focus of the full TEEB study to be undertaken in future:

- This scoping document identifies the thematic focus of the full TEEB study to five sectors in Georgia – namely energy, tourism, agriculture, mining, and forestry (the rationale for selecting these sectors is presented below in methodology);
- It identifies specific biodiversity and ecosystem services that relate to four of the above five sectors
- Provides preliminary analyses of current sector impacts and dependencies on biodiversity and ecosystem services and how these may change under alternate Sustainable Ecosystem Management (SEM) scenarios;
- Provides a tentative list of outputs that may be delivered by a full TEEB study for Georgia.

2. Identifies stakeholders in the TEEB process

- Within each of the sectors analysed, the document identifies policies and government agencies that are involved in the management of these sectors.

3. Determines the Knowledge base

- Provides an overview on some of the natural assets, identifying potential knowledge gaps

4. Establishes processes and governance for undertaking a full TEEB study

- The scoping study identifies work plan and milestones of a full TEEB study. The study also suggests a management and governance structure for implementing TEEB for Georgia.

2.3.2 Methodology for sector selection and analyses

To meet the first outcome of 'identifying objectives and thematic focus of a full TEEB study', sectors have been prioritized by taking account of various policy programmes of the government of Georgia. These sectors have also been chosen to maximize synergies between TEEB in Georgia and thematic components identified under Georgia's revised NBSAP-2⁶.

Furthermore, focusing on sectors is advantageous because their governance and stakeholders are relatively well-defined. The constituency of stakeholders might include representatives from (i) government departments that set regulatory frameworks for industries, (ii) industry lobby groups and (iii) community representatives. The constituency of winners and losers (i.e. the distributional effects of any policy) may also be easier to track in a sectoral approach.

⁶ Ensuring synergies between TEEB and NBSAP has also been echoed during the stakeholder workshop conducted on 26 February 2013 in Tbilisi, Georgia

The sectors chosen for analysis in this report are hydropower, tourism, agriculture and forestry. Georgia's current programme of the government "For Strong, democratic, United Georgia" explicitly identifies sustainable use of land resources and development of agriculture as priorities. "NBSAP- 2" identifies protected areas, agricultural biodiversity, and biodiversity of forests as three of its eleven thematic components.

Lastly, another reason to choose these respective sectors is that they each have a high level of dependence upon the health of local ecosystems, e.g. fresh water quantity and quality for irrigation and hydropower production, grasslands for livestock breeding, fertile soil for growing fruits and cereals, natural amenities for recreation and tourism. Policies aimed at stimulating these sectors could potentially lead in the future to irreversible impacts upon the very ecosystems and biodiversity upon which the specific sectors depend.

2.3.3 Methodology for Sectoral analysis

Each of these sectors is examined for growth trends, their governance and management, their relationship to biodiversity and ecosystem services, and how this relationship may change under alternative management scenarios. The ecosystem services analyses are done using the "Business as Usual" (BAU) and "Sustainable Ecosystem Management" (SEM) analytical framework. This methodology builds on the approach used by UNDP for the valuation of ecosystems services in the Latin American and Caribbean Region (Bovarnik et al, 2010). Trends in ecosystem services provisioning are projected if current management practices were to continue, and are examined if management practices change. This is done in order to show how changes in management of these sectors may address broader goals such as sustainability and inclusive development, and lead to multiple benefits such as freshwater provisioning, flood prevention, and other ecosystem services vital to human well-being. For these analyses, ecosystem services are classified as provisioning, habitat, cultural and regulating (TEEB in Local and Regional Policy and Management, 2012).

1. *Provisioning services* are products taken directly from ecosystems. These include, for example, fresh water, food, and raw materials such as fuel wood and timber. Natural products in the *food* ecosystem service include wild fruits, nuts, berries, mushrooms, edible greens, tubers, and other plant products, which are important direct sources of sustenance and well-being for rural people in Georgia. In terms of *raw materials*, some rural households consume as much as 15 cubic meters of fuel wood annually for heating and cooking (NEAPG, 2012).
2. *Regulating services* are the benefits obtained from the regulation of the physical, chemical and biological processes between organisms and their environments. In Georgia, the ecosystem service of *disturbance prevention and moderation* is provided by forest ecosystems which play a critical role in soil stabilization, and preventing and mitigating natural hazards such as avalanches, landslides, floods, and erosion (Flores & Adeishvili, 2011).
3. *Habitat/support services* are directly linked to the habitats that support species. Georgia is part of two of the world's 34 'biodiversity hotspots' which are characterized by a combination of biological richness and threat from anthropogenic pressures (Mittermeier et al, 2005). As such, Georgia provides the ecosystem service of *gene pool protection*.
4. *Cultural services* are the non-material benefits people obtain from ecosystems. In terms of the *recreation and tourism* service and specifically eco-tourism, visitation to Georgian protected areas has increased significantly (Agency of Protected Areas, Government of Georgia).

A full list of ecosystem services used in this report (along with definitions) is provided in Annex V.

Part III: Context

3.1 Georgia: Bio-physical overview

Georgia is located in the west of the South Caucasus region, bordering the Russian Federation in the north, and Republic of Turkey, Armenia and Azerbaijan to the east. It is located on the isthmus between the Black and Caspian Seas, mainly on the southern slopes of Greater Caucasus Mountain Range; only a small part of Georgia (Khevi, Tusheti and Pirikita Khevsureti provinces) are located on the Northern slopes of the Greater Caucasus Range (Maruashvili, 1970).



Figure 1 -Caucasus Ecoregion (by WWF-Caucasus)

Georgia covers an area of 69,494 square km, between 40' and 47' latitude east, and 42' and 44' longitude north. The land rises from sea level at the Black Sea to approximately 5,100 meters above sea level in the Greater Caucasus. Two thirds of the country is mountainous with an average height of 1000 meters. The country has a diverse landscape. Mountains dominate the northern, central and southern parts of the country: the Greater Caucasus in the north, the Likhi range in the central part and the lesser Caucasus and Javakheti volcanic plateau in the south. The Likhi range divides the country, from north to south, into western and eastern Georgia. To the west, the Kolkheti lowland plains extend to the Black Sea, and the Iberia Plains in the east open to the Caspian basin.



Figure 2 - Map of Georgia: forests and mountain areas

The climate of Georgia is similarly diverse. The Likhi ridge determines to a large extent the variability in climate across various parts of Georgia: West Georgia is characterized by a relatively humid subtropical climate, East Georgia has a drier, moderately humid climate and South Georgia has a continental climate (Fourth National Report to the CBD: Georgia).

Soils differ markedly between the west, east and south of the country with lowland wetland, mountain-forest and mountain-meadow soil zones prominent in the west; chestnut and black soils in the steppes and brown soils (in the Eldari semi-desert and various areas of the southern parts of Iori upland) are typical for the eastern province (Fourth National Report to the CBD: Georgia).

Georgia is also rich in water resources. With a total of 26,060 rivers, Georgia has a large river network, though the majority of these are less than 25 km long. The main rivers in West Georgia drain directly into Black Sea. Almost all the rivers in East Georgia flow into River Mtkvari and then through Azerbaijan to the Caspian Sea (Fourth National Report to the CBD: Georgia).

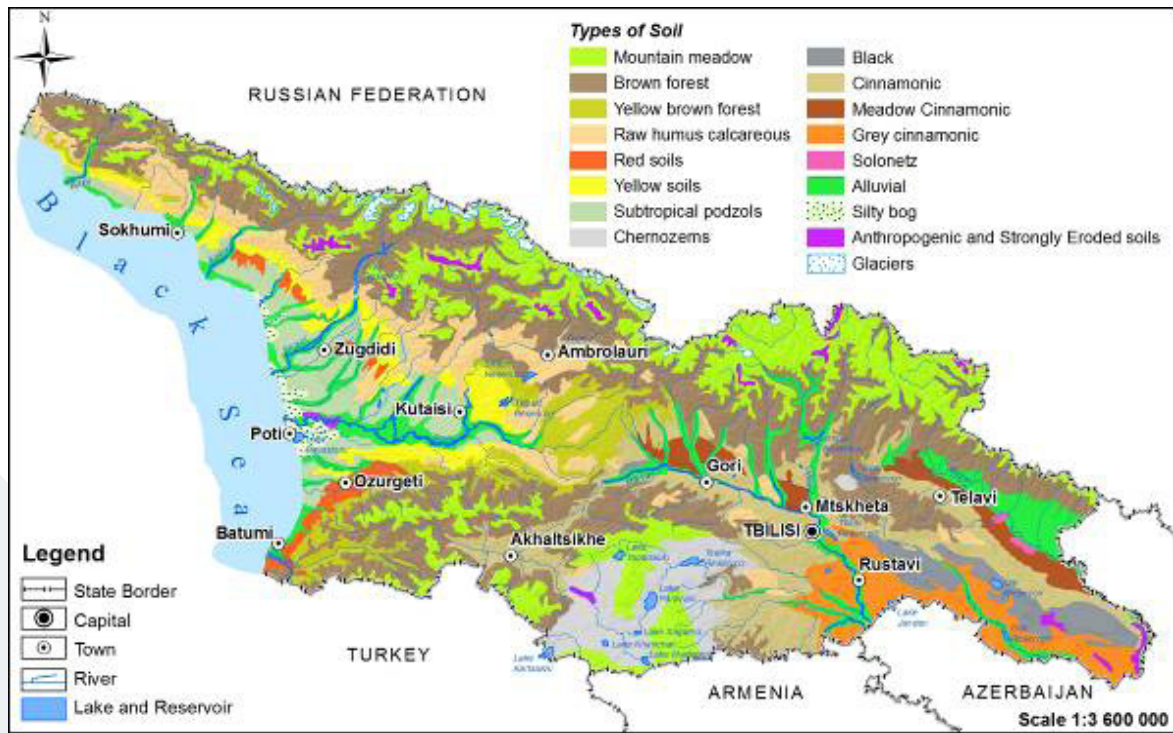


Figure 3 - Map of Georgia: water resources and soils

There are 850 freshwater lakes in Georgia, but the majority are very small and the total area of lakes does not exceed 170 km² (0.24% of total area). There are also 43 artificial reservoirs in Georgia (35 in the east and eight in the west). Western Georgia is bordered by the Black Sea and has a coastline of 330 km (Fourth National Report to the CBD: Georgia).

3.1.1 The Global Significance of Georgian Biodiversity

Georgia is part of the Caucasus which is listed as one of the 200 World Wildlife Fund (WWF) global terrestrial ecoregions (WWF, 2007). A related classification is that of biodiversity hotspots which are designated based on both biodiversity value and the anthropogenic threats to this biodiversity; of the 34 global hotspots, two are partially located within Georgia (the Caucasus and Irano-Anatolian biodiversity hotspots) (Mittermeier et al, 2005). The reason for the diversity found in this area has many sources: (i) its location at the juncture of two major biogeographic regions; (ii) the land form (the peninsula between the Black and Caspian Seas provides an important migration route and fly way); (iii) the topography of the landscape (with great variations in altitudes, and opportunities for isolation); and (iv) the climate which varies significantly across the country, resulting in very varied habitat types - from sub-tropical drylands and dry forests, to mountain tundra (NBSAP-1, 2005).

3.1.2 General threats to Georgian ecosystems and biodiversity

Due to habitat destruction and extensive, unregulated exploitation, many plant and animal species have become endangered, with 29 mammal, 35 bird, 11 reptile, two amphibian, 14 fish and 56 woody plant species currently included on the national Red List. 44 vertebrates found in Georgia are globally endangered and included on the IUCN Red List as vulnerable (VU) or higher. In the past century the goitered gazelle and the southern population (Trialeti ridge) of wild goat became extinct in Georgia. The leopard and striped hyena are still present but most likely exist as isolated individuals, and red deer numbers have drastically decreased (only three small populations have been preserved) in Georgia (Fourth National Report to the CBD: Georgia).

The main threats to biodiversity in Georgia are destruction/degradation of habitats and the extensive extraction of biological resources. The principal causes for habitat destruction are timber logging,

degradation of water ecosystems, mining, pollution and overgrazing (see footnote above). Intensive grazing is problematic for forests, subalpine ecosystems as well as the semi-arid zones in the south-eastern parts of Georgia where, in both cases, large numbers of grazing livestock (especially sheep) result in soil erosion. Livestock is often grazed in forest ecosystems which negatively impacts natural restoration cycles within forest stands (Fourth National Report to the CBD: Georgia).

The 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. The water quality of many rivers and reservoirs became critically low during the Soviet period. At present the main sources of water pollution are the utilities sector (67%), thermal power engineering (31%) and industry (2%). Additional sources of water pollution are agricultural run-off and domestic waste dumps on river banks. (Fourth National Report to the CBD: Georgia).

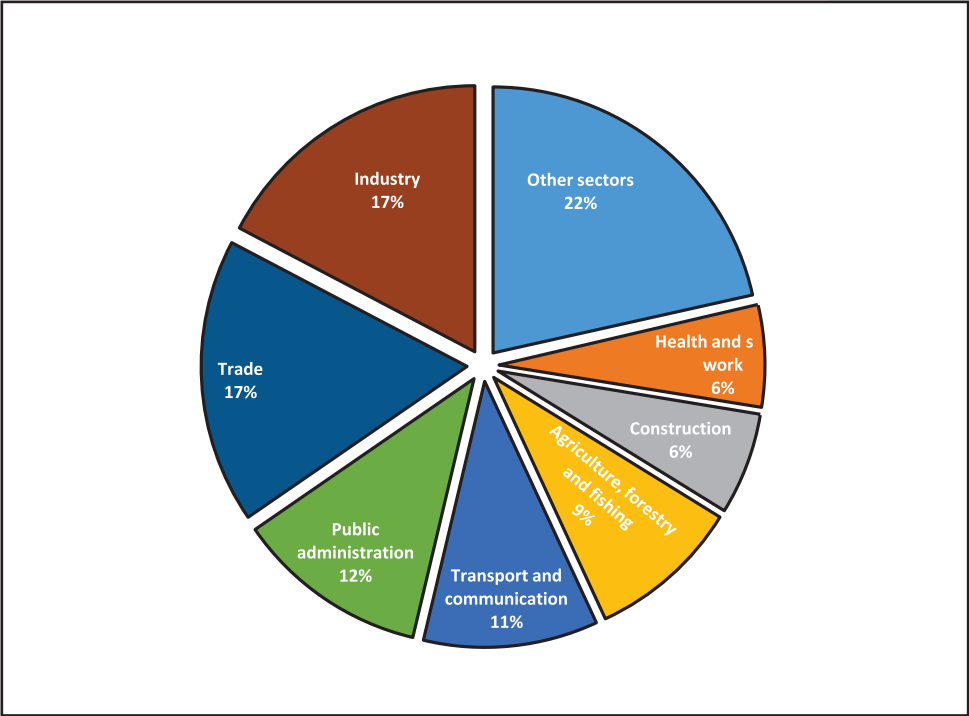
A major cause of the degradation of ecosystems and biodiversity might be characterised broadly as *governance*, particularly (but not exclusively) in forestry. This includes a lack of capacity in state institutions responsible for the overall management of natural resources, including monitoring and enforcement. Coupled with this, the regulations that such institutions are responsible for enforcing are themselves inadequate, particularly with regards Environmental Impact Assessment (EIA) and linked to this a lack of strategic environmental planning (Matcharashvili, 2010; 2012).

3.2 Georgia: Economic overview

3.2.1 Industrial sectors within the Georgian economy

According to the World Bank classification, Georgia currently belongs to the group of lower middle income countries (The World Bank, 2013). Gross Domestic Product (GDP) of Georgia amounted to about 14.4 billion USD (applying the official exchange rate) in 2011 with per capita GDP 3215 USD (National Statistics Office of Georgia, 2012). Industry and trade (retail and wholesale) are the two largest economic sectors having a 17.3% share of the GDP. The contribution of the transport and communication sector is 10.6% of GDP, and the share of agriculture, forestry, hunting and fishing is 9.3% (see Figure 2).

Figure 4 Georgia’s GDP structure by economic sectors in 2011



Source: National Statistics Office of Georgia.

3.2.2 General economic trends in Georgia

Georgia's economy achieved GDP growth of more than 10% in 2006-2007, based on inflows of foreign direct investment (FDI) and government spending. However, GDP growth slowed following the August 2008 armed conflict with Russia, and turned negative in 2009 as FDI and workers' remittances declined in the wake of the global financial crisis. The economy rebounded in 2010-2011, with growth rates above 6% per year, but inflows of FDI, the engine of Georgian economic growth prior to the 2008 conflict, have to date not recovered fully: in 2011 FDI amounted to 71% of that in 2008 (see table 2) (The World Bank, 2013). Unemployment has also remained high at around 16% in the period 2008-2011. Trends are summarized in Table 1.

Table 1. GDP of Georgia and some key economic indicators 2006-2011 (nominal and real GDP)

GDP in current prices, millions. GEL ⁷	13789.9	16993.8	19074.9	17986.0	20743.4	24344.0
GDP in constant 2003 prices, millions GEL	10868.0	12208.8	12491.4	12019.7	12771.3	13687.5
GDP real growth (%)	9.4	12.3	2.3	-3.8	6.3	7.2
GDP per capita (current prices), GEL	3133.1	3866.9	4352.9	4101.3	4675.7	5447.1
Exchange rates USD/GEL (Year average)	1.77	1.67	1.49	1.67	1.78	1.68
GDP per capita (current prices), USD	1763.5	2314.6	2921.1	2455.2	2623.0	3230.7
GDP in current prices, millions USD	7761.7	10171.9	12800.5	10767.1	11636.5	14438.5
FDI (millions USD)	1190.4	2014.8	1564.0	658.4	814.5	1117.2
Unemployment rate (%)	13.6	13.3	16.5	16.9	16.3	15.1

Source: National Statistics Office of Georgia, <http://geostat.ge>

Georgia's main economic activities in the industrial sector include: mining of manganese, copper, and gold; manufacturing of metals, machinery, and chemical fertilizers; processing of food and production of beverages such as spring and mineral waters, vine and other alcoholic and nonalcoholic beverages. Power production is becoming an increasingly important industrial sector (Ministry of Energy, Government of Georgia).

Main agricultural activities in Georgia include the cultivation of grapes, citrus fruits, and hazelnuts. Livestock breeding is also an important agricultural subsector. Tourism and nature-based tourism have grown significantly over the last years. The total output of tourism related services increased by 73.5% in the period 2006-2011 and amounted to 7.1% of the country's total economic output (Georgian National Statistical Service).

Part IV: Sector analyses

This chapter presents sectoral analyses of environmental and policy contexts for four of Georgia's most important economic sectors – hydropower, forestry, agriculture, and tourism. It identifies current policy regimes that govern these sectors, and the stakeholders involved in management thereof. It also allows the reader to see the relationships of the sectors to identified biodiversity and ecosystem services, and how these relationships may change under alternative management regimes. A full TEEB study would quantitatively examine these relationships, wherever applicable and also propose means and policies to optimize these relationships. The analyses presented here however are not specific to policy goals, due to limited stakeholder engagement in a scoping process. As part of a full TEEB study, policy goals may be identified, and sectoral analyses may include these policy goals.

4.1 Hydropower Sector

4.1.1 Sector trends

Georgia imports nearly all its required supplies of natural gas and oil. However, it has a sizeable hydropower capacity. According to the Georgian Ministry of Energy (MoE), there are about 300 rivers with significant power production potential, and total potential capacity of the rivers is estimated to

⁷ GEL – Georgian Lari, the national currency of Georgia. Exchange rate in December 2012 was 1 USD = 1.66 GEL.

be 15,000 MW with the average annual production potential amounting to 50 billion KWh (Ministry of Energy, Government of Georgia). MENR estimates that, at present, Georgia is exploiting only 18% of its hydropower resource potential.

One of the objectives for developing and exploiting Georgia's hydropower capacity is to export surplus electricity to neighbouring countries. New investments in the hydropower sector and both the rehabilitation of existing and the development of new hydropower stations have led to an increase in Georgian hydropower generation in the last decade. Since 2007, the levels of power production in Georgia have surpassed annual demand. By 2010, Georgia became a major exporter of electricity in the South Caucasus region, exporting 1.5 billion KWh of electricity power, accounting for 15% of the country's total electricity generation (Asian Development Bank).

Hydropower plants are often classified in three main categories according to operation and type of flow. These include, run-of-river (RoR) - (also called diversion, or derivation type HPPS), storage (reservoir), and pumped storage. HPPs all vary from the very small to the very large scale, depending on the hydrology and topography of the watershed (Kumar et al, 2011). Large plants have a capacity to generate greater than 100 MW, medium, 10-100 MW, and small sized may generate less than 10 MW. Regularly, storage and RoR HPPs are developed in Georgia.

A RoR HPP draws the energy for electricity production mainly from the available flow of the river. Such a hydropower plant may include some short-term storage (hourly, daily), allowing for some adaptations to the demand profile, but the generation profile will to varying degrees be dictated by local river flow conditions. As a result, generation depends on precipitation and runoff and may have substantial daily, monthly or seasonal variations. When even short-term storage is not included, RoR HPPs will have generation profiles that are even more variable, especially when situated in small rivers or streams that experience widely varying flows (Kumar et al, 2011).

Installation of RoR HPPs is relatively inexpensive and such facilities have, in general, lower environmental impacts than similar-sized storage hydropower plants (Kumar et al, 2011). Unfortunately current practice in Georgia requires only 10% of average annual water flow in the natural river bed with the rest assigned to derivative pipe to the power turbines (in spite of ecological value of the river or amount of natural flow). As a result, RoR HPPs have caused significant damage to ecosystems and biodiversity of Georgia.

Investments in this sector however have continued increasing. By the end of 2012, agreements between the Government of Georgia and various investors had been signed for the construction of 5 large, 28 middle sized, and 12 small sized HPPs (Ministry of Energy, Government of Georgia). Some of these include:

1. Khudoni HPP - with the installed capacity of 702 MW;
2. Nenskra HPP cascade - with the installed capacity of 300 MW
3. Dariali HPP- installed capacity 109.00 MW;
4. Paravani HPP - with the installed capacity of 87 MW;
5. Cascade of Namakhvani HPPs - installed capacity of 450 MW;
6. Cascade of HPPs on the rivers: Chorokhi, Lakhuni, Tekhura, Gubazeuli, Mtkvari, Adjaristskali, Khobistskali, Bakhvistskali etc. (Ministry of Energy, Government of Georgia).

The total capacity of the HPPs under construction agreements amounts to 1872 MW (Ministry of Energy). Construction of most of the HPPs is expected to be completed by 2018. This implies a circa 70% increase over the current capacity of 2700 MW of existing HPPs.

4.1.2 Sector Governance

Currently, three ministries are in charge of the development of the hydropower sector: the Ministry of Environment and Natural Resources Protection (MENRP), the Ministry of Energy (MoE) and the Ministry of Economy and Sustainable Development (MESD).

The Ministry of Environmental Protection is responsible for :

1. Overall governance and policy-making regarding environmental issues including water resources and biodiversity conservation;
2. Carrying out state ecological assessments and issuance of Environmental Impact Assessment (EIA) permits; and management of protected areas (including initiation of new protected area designations).
- 3.

The Ministry of Energy is responsible for:

1. Developing and implementing energy policy, including electric power sector/hydropower;
2. On behalf of Georgian Government signing of memorandums/agreements with investors on Building, Operating and Owning (BOO) of HPPs

The Ministry of Economy and Sustainable Development is responsible for:

1. Reviewing project-related technical documentation,
2. Issuance of construction permits (state ecological expertise is provided as an input to the construction permit)
3. Exercise of state surveillance over construction activities and their compliance with the standards and requirements of the project EIA.⁸

An important issue related to the development of HPPs is the sequencing (order) of procedures in the decision-making process. The Memorandum of Understanding (MoU) is signed between state and investor before the EIA is carried out. The MoU includes (i) HPP location, (ii) terms and conditions for obtaining construction permits, commencement of construction and subsequent commencement of operations, and (iii) annual generation capacity (Governmental Decree #107, Ministry of Energy, Government of Georgia). This sequencing allows for a very limited role of EIA in decision making as it relates to HPP development.

4.1.3 Business As Usual: Impacts and dependencies

This development of Georgia's hydropower sector is highly dependent on services provided by mountain ecosystems, particularly watershed services. Erosion control and the regulation of water flow are indispensable to ensure the requisite quality and quantity of water needed to produce hydropower. An increase in sedimentation of rivers due to land erosion may result in reductions in the water storage capacity of dams and the deterioration of turbines, leading to significant losses for hydropower companies.

Furthermore, the hydropower sector is not only dependent on forest ecosystems but also has impacts on these ecosystems. The construction of HPPs typically encroaches upon natural ecosystems due to damming, modifications to water flows (both location/direction and flow rates) and the building of roads and power lines. Moreover, nearly 47% of Georgia's population lives in rural areas and they are fully dependent on ecosystem services like water purification, erosion prevention, fuel wood provisioning etc. Any reduction in the provisioning of these services would imply measurable concomitant losses in social welfare, e.g. the need to purchase substitutes for timber and non-timber forest products, or the costs implied by an increase in the frequency and/or severity of flooding events. Preliminary project plans and EIA reports⁹ suggest that the building of planned large-scale HPPs will cause serious losses through flooding.

According to the World Commission on Dams (WCD) 2000 Report, negative impacts of large dams/HPPs on natural and social environment (involuntary resettlement, loss of traditions, destruction of natural environment and cultural heritage, landscape and local climate change) is so extensive, that they can never more be regarded as part of renewable energy (WCD, 2000).

4.1.4 Alternative policy options

⁸ Bulletin of Ministry of Justice: www.matsne.gov.ge

⁹ EIA reports can be found at www.aarhus.ge

Development projects may have adverse environmental impacts. However, there are certain tools such as Strategic Environmental Assessments (SEA) and EIA, which can help account for and mitigate these impacts. To date, no SEA for energy sector development has been carried out by the Georgian Government to detail the *cumulative* impact of the hydropower sector on communities, economies and ecosystems. While EIAs exist, there is a lack of strong legal and regulatory frameworks in the country for undertaking proper EIAs and ensuring public debates and public participation in decision-making prior to the initiation of development projects.

Business as Usual Scenario (BAU) entails developing 1872 MW extra capacity through new small, medium and large-scale HPPs (MoE, Government of Georgia). The following is considered as an alternative policy scenario:

1. Undertake SEA for the sector to avoid impacts exceeding local ecosystem thresholds, and to avoid degradation of primary ecosystems which are part of existing or proposed National Parks.
2. Improve EIAs to comply with requirements of International Financial Institutions and EU Directives; build capacity of state institutions dealing with the EIA process and monitoring of permit conditions; and conduct initial EIA prior to concession on the construction of specific HPP is granted.
3. Apply biodiversity offsets (see Annex VI) with obligatory payment into a compensation fund to establish new Protected Area of at least equivalent extent and quality as the habitat lost by HPP construction and operation.
4. Revise minimum flow requirements for RoR dams. Up-to-date information on hydrology of rivers however is not-available. This does not allow planning of HPPs based on ecological requirements. Gathering sufficient data on hydrology of rivers however may take a long time. To avoid this “dead end” it may be feasible to establish so called “No-Go-Zones”, which would prohibit, for the time being, construction of HPPs in areas distinguished by biodiversity until appropriate data will be collected to ensure fulfillment of concrete energy projects without significant impact on nature resources and social sustainability.

The proposed policy options are based on the approaches and practices applied in many countries for sustainable development. They are seen to be instrumental for shifting to Sustainable Ecosystem Management (SEM) in the Georgian hydropower sector. Section 4.1.5 illustrates how ecosystem services will be affected in BAU and SEM scenarios of hydropower sector development in Georgia.

4.1.5 Ecosystem service change analysis for hydropower sector

Table 1 summarises future projected changes in ecosystem service provisioning for the hydropower sector under BAU and SEM. The direction of change in ecosystems services is signified by arrows, with an explanation and evidence to support these trade-offs in ecosystem service provisioning.

Table 2 - Summary of ecosystem service change for the hydropower sector

Main service-types	Impact on ESS			Description
	BAU	SEM		
PROVISIONING SERVICES				
Food (e.g. fish, game, fruit)	↓		↑	BAU ↓ (i) Certain fish populations reduced due to habitat depletion, degradation and fragmentation; (ii) agricultural lands are flooded; (iii) habitat and migratory routes of game species lost SEM ↑ (i) It is still possible to have a healthy fish stock in a regulated river system if appropriate mitigation measures are implemented, e.g. special side channels or structures are built to help the fish continue upstream; in the case of derivation-type HPPs more than 10% of average annual flow are left in the rivers; (ii) Reservoirs are used for fishery and aquaculture development
Water (e.g. for drinking, irrigation, cooling)	↓	↑	↑	BAU ↓ (i) Altered water flow results in unavailability of water for alternative uses downstream; (ii) water quality is altered downstream of the dam making water unsafe for drinking BAU ↑ Water stored in reservoirs implies higher water available in dry seasons SEM ↑ More water is available for other uses downstream as dams are managed sustainably
Raw Materials (e.g. fibre, timber, fuel wood, fodder, fertilizer)	↓		↓	BAU ↓ High level of forestry loss due to flooding and encroachment SEM ↓ Medium/low level of forestry loss due to flooding and encroachment SEM ↑ Forests are protected in compensatory PAs
Genetic resources (e.g. for crop-improvement and medicinal purposes)	↓		↑	BAU ↓ High level of loss in genetic resources due to flooding and encroachment SEM ↓ Medium/low level of loss in genetic resources SEM ↑ Genetic resources are protected in compensatory PAs and conservation centres (botanical gardens; gene pool reserves)
Medicinal resources (e.g. biochemical products, models & test-organisms)	↓		↑	BAU ↓ Medicinal resources are lost due to flooding and encroachment SEM ↓ Loss of medicinal resources but at a moderate/low level due to lower levels of flooding and encroachment SEM ↑ Medicinal resources are protected in compensatory PAs and conservation centres (botanical gardens, gene pool reserves)
Ornamental resources (e.g. artisan work, decorative plants, pet animals, fashion)	↓		↑	BAU ↓ Ornamental resources are lost due to high levels of flooding and encroachment SEM ↓ Less loss owing to lower levels of flooding and encroachment SEM ↑ Ornamental resources are protected in compensatory PAs and conservation centres
REGULATING SERVICES				
Climate regulation (incl. C-sequestration, influence of veg. on rainfall, etc.)	↓		↓	BAU ↓ (i) Large amounts of carbon that are stored in trees and plants are released when the water reservoirs are filled with water for the first time leading to rot. This leads to the build-up and release of methane, a potent greenhouse gas (ii) Local climate altered due to higher evaporation. SEM ↑ (i) Moderate/low build-up and release of methane, a potent greenhouse gas (ii) Local climate altered but to a lesser extent
Moderation of extreme events (e.g. storm protection and flood prevention)	↓	↑	↑	BAU ↑ Dams used for storm and flood prevention BAU ↓ Some dams withhold water and then release it all at once, causing the river downstream to suddenly flood. This action can disrupt plant and wildlife habitats SEM ↑ Dams are managed sustainably for storm and flood prevention

Main service-types	Impact on ESS		Description
	BAU	SEM	
Regulation of water flows (e.g. natural drainage, irrigation and drought prevention)	↓	↑	BAU ↓ Major downriver hydrological changes destroy riparian ecosystems dependent on periodic natural flooding, exacerbate water pollution during low-flow SEM ↑ (i) Dams are managed sustainably regulating water flow as appropriate to reduce environmental impact (ii) Ecosystems are protected in compensatory PAs
Waste treatment (esp. water purification)	↓	↓	BAU ↓ Damming of rivers cause water quality deterioration, due to the reduced oxygenation and dilution of pollutants by relatively stagnant reservoirs SEM ↓ Less large scale damming of rivers and thus lower water quality deterioration
Erosion prevention	↓	↓	BAU ↓ Reduced sediment and nutrient loads downriver of dams increase river-edge and coastal erosion and damage the biological and economic productivity of rivers and estuaries SEM ↓ Reduced sediment and nutrient loads downriver of dams, but to a lesser extent than BAU
Maintenance of soil fertility (incl. soil formation)	↓	↓	BAU ↓ Fertile soil is lost due to flooding and encroachment SEM ↓ Fertile soil is lost but to a lesser extent compared to BAU
HABITAT SERVICES			
Maintenance of life cycles of migratory species (incl. nursery service)	↓	↓	↑ BAU ↓ (i) Terrestrial natural habitats lost to flooding and encroachment; wildlife nourishment areas and travel routes are affected (ii) Power lines affect the bird population, either through collision or by short circuit due to contact SEM ↓ (i) Terrestrial natural habitats and wildlife nourishment areas, travel routes affected but each to lesser extent than BAU (ii) Power lines affect the bird population but to a lesser extent than BAU SEM ↑ Compensatory PAs provide sustainable habitat to flora and fauna
Maintenance of genetic diversity (esp. gene pool protection)	↓	↓	↑ BAU ↓ Flooding areas for dams and encroachment reduce flora and fauna and, respectively, gene pool. SEM ↓ Flooding but to a lesser extent than BAU SEM ↑ Compensatory PAs provide sustainable habitat to flora and fauna
CULTURAL SERVICES			
Aesthetics	↓	↑	BAU ↓ Ecosystems with valuable aesthetic information is lost due to flooding or affected by construction works SEM ↑ Compensatory PAs provide more valuable or equal aesthetic information to that lost (if at all) by small-scale HPPs
Opportunities for recreation & tourism	↓	↓	↑ BAU ↓ Damming of large areas reduces public access to certain areas, and thereby affects outdoor recreation opportunities SEM ↓ Some reduced public access, but lesser impact compared with BAU SEM ↑ (i) Reservoirs are used for recreation & tourism (ii) Compensatory PAs provide opportunities for recreation & tourism
Inspiration for culture, art and design	↓	=	BAU ↓ Cultural heritage, including archaeological, historical, paleontological, and religious sites and objects are inundated by reservoirs or destroyed by construction activities SEM = Sites with significant cultural heritage are not subject to damming

Main service-types	Impact on ESS			Description
	BAU	SEM		
Spiritual experience	↓	↓	↑	BAU ↓ Ecosystems are flooded or affected by construction activities reducing opportunities for spiritual experience SEM ↓ Ecosystems are flooded but to a lesser degree SEM ↑ (i) Compensatory PAs provide opportunities for spiritual experience (ii) Proper application of EIA process avoids flooding of important sites

4.1.6 Conclusions

The key messages that we might take from the analysis of HPPs (BAU versus SEM) are as follows:

1. The application of Strategic Environmental Assessment (SEA) in energy policy planning provides the opportunity for substantial potential win-win outcomes for Georgia. Such planning can mitigate the extent of losses in ecosystem service provisioning through HPPs.
2. SEA achieves this through evaluation of *cumulative* anthropogenic impacts; an EIA should capture localised effects on ecosystems but also other possible spill-over effects that are non-localised.
3. HPPs not only affect ecosystem but are reliant upon them and thus are affected by them. In the absence of a comprehensive SEA that looks at the resilience of ecosystems, the future economic viability of large-scale HPPs is threatened.
4. Post-SEA analysis, it remains critical that localised EIA are carried out in accordance with international best practice.
5. Some of these 'quick wins' from SEA/EIA realise tangible benefits that have either a direct or indirect market price.
6. Direct market benefits include (but are not limited to) enhanced fish populations, increased agricultural output productivity through higher soil fertility and lower erosion, increased timber yields, higher water quality for the beverages industries etc.
7. Indirect benefits include greenhouse gas mitigation through reduced deforestation, which has a market value, opportunities for leisure and recreation at reservoirs, avoidance of costs of 'averting behaviour' as local Georgians in rural communities have to prepare for increases in flooding events etc.
8. The impacts of large-scale HPPs may not evenly distributed across Georgian society - they fall disproportionately on the rural poor who rely on forests for fuel wood and non-timber forest products, and who are affected by encroachment on their agricultural lands and by flooding events etc. It is important that there are forums where the viewpoints of local communities are heard and accounted for. EIA is a mechanism to allow this.
9. Biodiversity offsets can serve to mitigate directly some of the losses in ecosystem services and biodiversity that arise from HPPs development. Owing to the fact that there is flexibility in terms of where they are located (whereas there is less flexibility in terms of HPP location), there is again the potential for 'quick wins' from biodiversity offsetting. However offsetting should not be seen as a replacement for SEA and EIA but rather a complimentary process.

4.2 Tourism Sector

4.2.1 Sector trends

Tourism is one of the fastest growing sectors of the Georgian economy. According to the National Statistics Office of Georgia, the total output of tourism related services (including hotel services, camping sites and other short-stay accommodation, restaurant services and transportation, travel agency and tour operator services) increased by 73.5% in 2011 as compared to 2006, and amounted to 7.1% of the country's total economic output (Georgian National Statistical Service).

Furthermore, Nature based tourism is becoming an increasingly important subsector in Georgia. Data provided by the Georgian Agency of protected areas suggests that there has been a progressive increase in visitation rates to Georgian protected areas over the last few years; visitation has increased from 5,669 people in 2005 to 303,686 in 2011.

Despite the momentum of the tourism sector, no official strategy or program has been adopted in Georgia for the development of the tourism sector to date. The company SW Associates and the America-Georgia Business Council were contracted by the US Trade and Development Agency in 2007 to provide the Ministry of Economic Development of Georgia and the Georgian tourism industry with a comprehensive plan for sustainable tourism development (SW Associates). "The Georgian Way - A Comprehensive Plan for Sustainable Tourism Development in Georgia" was prepared in February 2008 by SW Associates. The focus of the plan was to develop a formal tourism strategy which would serve as a roadmap for economic growth in Georgia through sustainable tourism development. Although this document has contributed to the evidence base on tourism development, to date there has been no official strategy and action plan for this sector. Further, no comprehensive analysis has been carried out to assess trends in the sector, the needs and demands of different categories of tourists, and strategies for meeting those needs.

In the absence of an official strategy and action plan, no comprehensive analysis has been carried out to assess trends in the sector, the needs and demands of different categories of tourists, and strategies for meeting those needs.

4.2.2 Governance

The Georgian National Tourism Administration (GNTA) is in charge of developing the tourism sector in Georgia. The mission of GNTA is to ensure sustainable tourism development. Its strategy is to (GNTA, 2012):

1. Significantly contribute to the *national economy* by increasing the employment rate, increasing tourist spend and tourist numbers, encourage tourism investment, and supporting domestic private sector development through effective public and private partnership
2. Promote Georgia as a *unique travel destination* by creating brand identity and positioning the country on the tourist map, gaining competitive advantage and increasing market share.
3. *Improve visitor experience* by developing infrastructure, improving service quality, improving education quality, developing HR skills and through supporting and implementing product development

The Agency of Protected Areas (public law legal entity under the Ministry of Environmental Protection) is responsible for ecotourism development and monitoring in National parks and other protected areas¹⁰.

4.2.3 BAU: Impacts and dependencies

It is expected that the number of tourists will grow in Georgia in the coming years. The tourism industry, if not properly planned and managed, may exert significant pressures on ecosystems. These pressures have not to date been studied or assessed extensively. Some of the general environmental impacts of tourism are as follows (Rajebashvili, 2012):

- *Impacts on natural resources*: In regions where water is scarce, the construction of new hotels and other water intensive infrastructure can further exacerbate scarcity.
- *Pollution and waste*: emissions from tourism-related transportation can contribute to deteriorating air quality. Runoff from new hotels and motels can also contribute to water pollution. Moreover,

10 Bulletin of ministry of Justice www.matsne.gov.ge also see website of APA - <http://www.apa.gov.ge/index.php?site-id=28> - Order N 96 Of the Minister of Environment Protection and Natural Resources of Georgia On Approval of Regulation of Protected Areas Agency

solid waste around tourist destinations, when visitor numbers are much higher than local capacity, can pose a high risk of degradation to natural ecosystems, and losses in ecological and aesthetic values.

- *Physical impacts*: Specific impacts can be seen from tourism activities such as off-road driving in fragile areas which can impact upon populations of nesting birds and small mammals. Furthermore, unplanned recreational activities such as hiking, walking and mountain biking can have negative impacts on vegetation.
- *Loss of biological diversity*: The development of infrastructure near ecologically-sensitive areas can lead to significant losses in biodiversity. Recently, 842 hectares of forest land was cleared in Kolikheti National park for construction of a highway (Poti-Anaklia) and development of new resorts. Since 1996, this territory has been included in the Ramsar List of Wetlands of International Importance.

Lastly, there is also evidence of adverse impacts of tourism on property holdings of local populations. Land plots are not legally registered in the high mountainous regions of Georgia. For centuries, the local population has owned property by inheritance and land plots have been distributed (or re-distributed) based on agreements between ancestors. The two grounds for the legalization of ownership rights prescribed under Georgian legislation ("arbitrary occupation" and "lawful possession") do not in most cases conform to the ownership form found in Georgia (traditional possession) (The case of the Mestia, 2011). Linked to these expansion plans, there have reportedly been instances of conflict between local communities and land development agencies on the issues of land acquisition (The case of the Mestia, 2011).

Additionally, the economic impacts of tourism on local economies are controversial. A study of the sustainable development capacity of Zemo Svaneti (2006) revealed that the majority of local residents saw little prospect that the development of tourism would improve their lives: engaging in the tourism business requires certain capital investments which only certain families can afford. Hence, the development of tourism for the rural poor is associated with further wealth and income creation for those families that are already wealthy, rather than the development of the region in general.

4.2.4 Alternative policy options - SEM

In the Business as Usual Scenario (BAU) tourism sector will continue to grow in Georgia. However, in the absence of adequate infrastructure and services, including solid waste and wastewater management services, as well as poor land use and development planning, there is a high risk that tourism sector will adversely affect Georgia's fragile ecosystems, reducing their ecological and aesthetic values.

Alternative tourism development policy in Georgia, oriented towards sustainable ecosystems management, could be based on the following elements:

1. Establish new PAs in mountain areas and improve interpretation programs and visitors centers in existing National Parks.
2. Establish visitor fees to cap numbers and use these funds to improve tourism through (i) improved infrastructure for tourists - waste management, signposts and tracks, and information and (ii) improved PA management, monitoring and enforcement.
3. Develop new types of sustainable, responsible, and community-based tourism.
4. Connect national parks through corridors, and at a broader level, adopt other best practice of national park management (charging user fees for example).

4.2.5 Ecosystem service change analysis

Table 2 summarizes future projected changes in ecosystem service provisioning for the tourism sector under BAU and SEM.

Table 3 - Summary of ecosystem service change for the tourism sector

Main service-types	Impact on ESS		Description
	BAU	SEM	
PROVISIONING SERVICES			
Food (e.g. fish, game, fruit)	↓	↑	BAU ↓ (i) Fish stocks decline owing to eutrophication from waste water and municipal solid waste release to water bodies; (ii) Productive land, wetlands and forests replaced by tourist infrastructure SEM ↑ Improved waste management funded by park entry; Important ecosystems (wetlands, forests) are protected
Raw Materials (e.g. fiber, timber, fuel wood, fodder, fertilizer)	↓	↓	BAU ↓ New tourist facilities – building material and on-going fuel wood use SEM ↓ Cap on tourist numbers – less new infrastructure, so reduction in provisioning but SEM smaller reduction than BAU
REGULATING SERVICES			
Air quality regulation (e.g. capturing (fine)dust, chemicals, etc.)	↓	↑	BAU ↓ Uncontrolled tourist development, e.g. draining wetlands or removal of peatlands, forest depletion, leads to decrease in air quality SEM ↑ Better management and control in Pas; Enlargement of PA system
Climate regulation (incl. C-sequestration, influence of veg. on rainfall, etc.)	↓	↑	BAU ↓ Uncontrolled tourist development, e.g. draining wetlands or removal of peatlands, releases stored carbon SEM ↑ Better management and control in Pas; Enlargement of an capacity building of PA system
Waste treatment (esp. water purification)	↓	↑	BAU ↓ Uncontrolled tourist development can decrease capacity of ecosystem to treat waste SEM ↑ Better management and control in Pas; Enlargement of an capacity building of PA system
Erosion prevention	↓	↑	BAU ↓ Tourist numbers with restricted number of tracks SEM ↑ Better management, more sign posting, lower tourist numbers in PAs
HABITAT SERVICES			
Maintenance of life cycles of migratory species (incl. nursery service)	↓	↑	BAU ↓ Destruction of critical nursery habitats SEM ↑ Establishment of bird-watching facilities in Pas; Enlargement of an capacity building of PA system
Maintenance of genetic diversity (esp. gene pool protection)	↓	↑	BAU ↓ No control and enforcement mechanism preventing harvesting threatened flora and fauna SEM ↑ Information and checks in PAs
CULTURAL SERVICES			
Aesthetic information	↓	↑	BAU ↓ Plastic waste, untreated solid waste, eutrophication leading to algal blooms, overcrowding, unsympathetic tourist infrastructure SEM ↑ All above mitigated by PA funds and control in PAs
Opportunities for recreation & tourism	=	↑ ↓	SEM ↓ Higher costs for non-residents reduces opportunities, but might mean an overall increase in revenue SEM ↑ higher quality of tourist experience for residents and non-residents
Inspiration for culture, art and design	↓	↑	BAU ↓ Plastic waste, untreated solid waste, eutrophication leading to algal blooms, overcrowding, unsympathetic tourist infrastructure SEM ↑ All above mitigated by PA funds and control in PAs
Spiritual experience			
Information for cognitive development			

4.2.6 Conclusions

Tourism is one of the fastest growing sectors of the Georgian economy and nature based tourism has become an important economic sub-sector. This sector can play a key role in the country's economic development.

Before instituting work on tourism projects, a Strategic Tourism Plan should be prepared and adopted in consultation with all interested stakeholder groups, including sector agencies, local tourism and business operators, non-governmental organizations and scientific institutions. The Plan should set out an inventory of current and potential tourist attractions identify what needs to be done to enhance tourism opportunities, as well as specific goals and objectives to improve the marketing and appeal of the area (Rajebashvili, 2012).

The key messages that we might take from the analysis of tourism (BAU versus SEM) are as follows:

1. In the absence of adequate planning for sector development, including effective land use planning with appropriate EIAs, a lack of appropriate environmental infrastructure and services such as solid waste and wastewater management, there is high risk that the tourism sector will adversely *affect* fragile Georgian ecosystems.
2. Some of these adverse effects may negatively impinge upon the tourist experience (e.g. untreated sewage affecting bathing water quality; soil erosion from off-road vehicles making pathways and roads impassable; draining wetlands which can increase the prevalence and intensity of storm events; unregulated waste disposal implying plastic litter in otherwise pristine nature spots).
3. In other cases, the negative impacts do not directly affect the Georgian tourism sector but might have wider economic impacts, for instance the appropriation of freshwater that has a high economic opportunity cost which is borne by other sectors in the Georgian economy.
4. If these costs of uncontrolled tourism are not estimated and included in planning then the benefits from the tourism sector will be systemically over-stated in the national accounts.
5. Adaptive environmental regulations (to protect sensitive areas from "over-tourism") based on sustainable management practices should be an integral part of state and local governance to reduce these often 'hidden' costs of unfettered tourism.
6. Enabling stakeholders (e.g. Agency for Protected Areas) to increase the targeting of tourism revenues to local communities can be a 'quick win' as the communities then have a new vested interest in improving the tourist experience and simultaneously enhancing the cultural services that they enjoy.
7. The extension of or creation of PAs can provide new opportunities for nature tourism, particularly from tourists coming from Western Europe. Activities might include bird-watching and hiking on designated footpaths.

4.3 Agriculture Sector

4.3.1 Sector trends

Agriculture has been identified by the Government of Georgia as a main vehicle for rural development. The current programme of the government, "Government Program for Strong, democratic, United Georgia", states that "Development of agriculture will be one of the main priorities of the government of Georgia, which will be guaranteed by clear rural and regional policy and increasing of financing of agriculture."

Nearly 47% of the Georgian population lives in rural areas and about 50-53% of the country's workforce is employed in agriculture (National Statistics Office of Georgia). Agricultural land, including arable land, perennial crops, hay fields and pastures, occupies approximately 3 million hectares or about 43.5% of the country's territory (National Statistics Office of Georgia). Approximately 30% of the cultivated land is sown for perennial crops such as fruits (grapes, apple, pear, cherry, peach/apricot, berries, citrus fruit), nuts

(walnuts and hazelnuts), tea and vegetables. The other 70 % is covered by annual crops such as grains (wheat, maize, barley and sunflower), grapes, legumes, potatoes, sugar beet and tobacco (The World Bank, 2007). Georgia's agriculture is mainly of a subsistence nature: more than 90% of the agricultural production is concentrated within highly fragmented small-scale family holdings. On average, the size of a family holding is 1.22 hectares, fragmented into two or three land parcels of 0.45 hectares on average. Around 82% of family holdings produce mainly for self-consumption, while the remaining 18% produce cash crops (Kvaratskhelia, Shavgulidze, 2011). Additionally, livestock is an important subsector of the agriculture. Cattle, sheep, pigs and goats are the major livestock. Even though the cash income of the households engaged in agriculture is low, the sector provides an important safety net for most of the rural population, and its performance is crucial to poverty reduction (Kvaratskhelia, Shavgulidze, 2011).

Despite the sector's importance, agriculture's share of GDP has continued to decline in recent years, from around 50% in the 1990s, to about 8-9% in 2008-2011 (Sutton et al. 2007). The revival and growth of agricultural production has since 2012 been given a high priority in the political agenda of the government. The government has promised to establish a fund with a 1 billion GEL initial capital allocation to support farmers with grants and preferential credits, raw materials and machinery, and provide extension services (Principal provisions, Governmental Program for "Stronger, Democratic, United Georgia", October, 2012). The government's objective is to increase productivity in the agriculture sector, as well as to increase the food security and to promote export and protect agro-biodiversity. (Principal provisions, Governmental Program for "Stronger, Democratic, United Georgia", October, 2012.)

A National Food and Agriculture Strategy (2006-2015) was drafted under the USAID-funded technical assistance project AgVantage. This draft policy contained a chapter dedicated to environmental protection and sustainability. Specific environmental issues such as soil erosion, water pollution and the handling of pesticides and agrochemicals were addressed, and ad hoc policy measures and cost projections for 2007-08 were reported (Sutton et al. 2007). The document was submitted to the Ministry of Agriculture (MOA) for consideration; it has not been adopted by the Government

4.3.2 Governance

The Ministry of Agriculture of Georgia has overall governmental governance responsibilities for agricultural produce, soil fertility, plant protection, livestock breeding, agricultural engineering and veterinary science.¹¹

According to a new Governmental program entitled "For Strong, democratic, United Georgia" (19 November 2012)¹², the development of agriculture will be one of the main priorities of the government of Georgia, which will be coupled with clear rural and regional policy and increases in the financing of agriculture.

4.3.3 BAU: Impacts and dependencies

Unsustainable agricultural practices in the past have severely affected Georgia's environment¹³. Of approximately 3 million ha of agricultural land, nearly 35% is degraded as a consequence of erosion. This is particularly the case in eastern Georgia where erosion has affected about 300,000 ha of arable land, plus 700,000 ha of pasture land. Furthermore, 11% of agricultural lands in the country is affected by acidity and 5.1% by excessive potassium and nitrates (Sutton et al. 2007). Waterlogging and salinization affect as much as 20% of all irrigated land with saline soils prevailing in eastern Georgia, covering 157,600 ha of the 40,000 ha in the Alazani Plains, 8,000 are salinized, and the problem has been worsening in recent years (The World Bank, 2007).¹⁴

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

11 Bulletin of ministry of Justice www.matsne.gov.ge

12 The Government of Georgia http://government.gov.ge/index.php?lang_id=ENG&sec_id=41

13 National Report on the State of the Environment of Georgia, 2007-2009

14 The World Bank, November 2007, Integrating Environment into Agriculture and Forestry: Progress and Prospects in Eastern Europe and Central Asia. Volume II. Georgia Country Review.

CWRs of cereals, including relatives of wheat and millet, which occur in arid or semi-arid lands, are severely affected by over-grazing and desertification. One of the most serious threats to the diversity of CWRs is genetic erosion and pollution (including threat of genetic pollution by GMOs). The majority of local landraces and breeds of domestic animals are at risk of extinction due to their uncontrolled cross-breeding with introduced breeds. For instance, 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. Kakhuri, Svanuri and Rachuli pig are in decline and the Tushuri horse is in decline. The Megruli horse is at risk of complete extinction. The Georgian bee is threatened with genetic erosion (NBSAP-2)

Intensive grazing in the alpine zones of the Eastern Caucasus has resulted in a decrease in the feeding base and habitat quality of the wild ungulates (although hunting seems to be much more limiting factor for these species), particularly for the chamois, east Caucasian tur and red deer. The subsequent decrease in the wild ungulate numbers is probably one of the main causes of current conflicts between large carnivore species, such as the wolf, and local communities (NBSAP-2, forthcoming). In Georgia's semi-arid ecosystems, used as winter pastures for sheep, overgrazing is especially intense causing severe erosion. This particular form of habitat degradation has resulted in a dramatic reduction in the availability of natural grazing areas and, in conjunction with hunting, has already led to the local extinction of the red deer and goitered gazelle. Species of some small mammals of Georgia's fauna are rare with very limited and fragmented habitats due to grazing and agriculture and intensive use of agro-chemicals (NBSAP-2, forthcoming). Sustainable pasture management therefore should be one of the priority objectives for the protection of biodiversity and local economic development.

Water ecosystems in Georgia have also 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. It is generally recognised that pollution now threatens many of the species associated with Georgia's wetlands. Pollution by nutrients is causing eutrophication of the Black Sea, resulting in "dead zones" (NBSAP-2)..

Lastly, the availability of natural resources and ecosystem services such as clean water, fertile soil, favourable climate, and biological pest control are essential for nearly 53% of Georgians who are engaged in agriculture. Degradation and depletion of these resources due to unsustainable agricultural practices in the past have already affected the livelihoods of significant parts of the rural population. Examples include the reduction of soil fertility due to erosion, water bogging of farmlands, and degradation of pasturelands widely observed in various parts of the country.

4.3.4 Alternative policy options - SEM

In the BAU scenario, some growth within the agricultural sector is expected in Georgia with an associated impact on the environment.

Under SEM, the environmental impacts could be minimized by implementation of balanced preventive environmental policies and measures. These include the following:

1. Increasing agricultural productivity within sustainability thresholds (stocking density; pesticide and chemical fertilizer application limits) through investment in agricultural knowledge, science and technology (AKST) (UNEP- DEWA).
2. AKST through the promotion of methods such as optimal crop rotation, terracing, sustainable pasture land management, biological pest control, farm diversification (such as agro-tourism).
3. Encourage organic farming through appropriate fiscal and legal measures.

4.3.5 Ecosystem service change analysis

Table 3 illustrates how the environment and ecosystem services will be affected in BAU scenario and how

provision of these services is projected to change if the proposed SEM policy elements are implemented in Georgian agricultural sector.

Table 4 - Summary of ecosystem service change for the agricultural sector

Main service-types	Impact on ESS		Description
	BAU	SEM	
PROVISIONING SERVICES			
Food (e.g. fish, game, fruit)	↑	↓	↑ BAU ↑ Historic trend in productivity increase in the agricultural sector BAU ↓ Agricultural run-off resulting in water quality deterioration/eutrophication and fish stock reduction SEM ↑ Improved management leads to higher food productivity
Water (e.g. for drinking, irrigation, cooling)	↓	↑	BAU ↓ (i) Agricultural run-off resulting in water quality deterioration/eutrophication (ii) Depletion of water resources from poor irrigation infrastructure and inappropriate management (iii) Drinking water quality deterioration caused by livestock fecal matter SEM ↑ (i) Reduced stocking density reduces release of fecal matter (ii) Corrective actions on irrigation
Raw Materials (e.g. fiber, timber, fuel wood, fodder, fertilizer)	↓	↑	BAU ↓ Poorly managed irrigation causing flooding of riparian forests. Deforestation caused by unsustainable grazing SEM ↑ Improved management control
REGULATING SERVICES			
Climate regulation (incl. C-sequestration, influence of veg. on rainfall, etc.)	↓	↑	BAU ↓ Increased intensification and higher stocking densities increases methane emissions SEM ↑ Lower stocking density decreases methane release
Maintenance of soil fertility (incl. soil formation)	↓	↑	BAU ↓ Unsustainable, tillage, monoculture, artificial field fires, overgrazing SEM ↑ Crop rotation, sustainable irrigation, raising farmers knowledge of modern farming methodology, including pasture management
Pollination	=	=	BAU ↓ Unsustainable (over) using of chemicals reduces population on insects SEM ↑ Raising farmers knowledge of modern farming methodology
Biological control (e.g. seed dispersal, pest and disease control)	=	↑	BAU ↓ Unsustainable (over) using of chemicals for pest control SEM ↑ Biological pest control
Maintenance of life cycles of migratory species (incl. nursery service)	=	=	BAU ↓ Degradation of migration routes, including riparian forests, watersheds caused by unsustainable pasture management SEM ↑ Protection of riparian forests and watersheds through sustainable pasture management
Maintenance of genetic diversity (esp. gene pool protection)	↓	↑	BAU ↓ Stimulation of industrial species SEM ↑ Promotion of local varieties
CULTURAL SERVICES			

Aesthetic information	=	↑	BAU ↓ Soil erosion caused by unsustainable pasture management SEM ↑ Crop rotation, sustainable pasture management
Opportunities for recreation & tourism	=	↑	SEM ↑ Farm diversification and agro-tourism
Inspiration for culture, art and design	=	↑	BAU ↓ loss of local varieties of fruit, livestock and crops SEM ↑ Crop diversity, local Georgian varieties of fruit, livestock and crops

4.3.6 Conclusions

What appears on first inspection to be incontrovertible from the analysis of agriculture is that the provisioning of ecosystem services is higher under SEM versus BAU. But what the analysis of agriculture does not do – as is the case for the other three case study sectors as well – is apply a *weighting* to any trade-offs that occur. This is particularly of importance for the agricultural sector as the provisioning service of ‘food’ is the very reason that the sector exists. The analysis above indicates that both BAU and SEM are projected to provide higher provisioning of this service, but there is further substantive analysis required (that is beyond the scope of the current report) to determine which alternative provides higher food output levels and the extent of the divergence in productivity in comparing BAU versus SEM.

Notwithstanding this, it is the case that over-intensification can produce significant externalities that can, at the margin, be more costly in terms of social welfare loss than the gains (in terms of the market value of increased produce).

The key messages that we might take from the analysis of the agricultural sector (BAU versus SEM) are as follows:

1. Sustainable farming practices under SEM have a potential to be profit-maximising strategies in the medium to long term as intensive farming can affect ecosystem services (like soil fertility) which the sector depends on.
2. Poor agricultural practices lead to impacts on other sectors such as tourism (through run-off and eutrophication of water bodies, and reduced water availability owing to poorly maintained irrigation infrastructure) and forestry (through unsustainable pasture management)
3. Specific areas where farmers’ skills and knowledge should be enhanced include pesticide and chemical fertilizer application limits, biological pest control, soil conservation, water use efficiency, food safety, crop rotation and farm diversification, pasture management.
4. Agriculture is also linked to tourism in that there is the opportunity to promote low impact agro-tourism, particularly targeting tourists from Western Europe
5. The diversity of local endemic crop varieties is threatened by intensive monocultures. This the loss of an ecosystem service (maintenance of genetic diversity) that is valuable to Georgia as a nation but potentially to the global community
6. Local, small-scale subsistence farming contributes to the historic make-up of Georgian society and thus contributes to cultural services which would be otherwise lost under intensification and the assimilation of smallholdings into larger farms
7. Such subsistence farming also provides a source of revenue and subsistence for poorer rural families; the substitution of such direct sources of sustenance for alternatives bought in the market increases the susceptibility of these families to the vagaries of market price fluctuations and supply variability, with an associated reduction in food security.
8. The full ramifications of the introduction of GMOs should be assessed, particularly in light of the trend in consumers to boycott such produce in some of the nations that might import Georgian agricultural produce.
9. By contrast, the opportunities to enter the market for organically-certified produce should be appraised as part of plans to expand the agricultural sector.

4.4. Forestry sector

4.4.1 Sector trends

About 40% of Georgia's territory is forested. About 97% of forests are located on the slopes of the Greater and Smaller Caucasus Mountain systems; the rest are found in the valleys of East Georgia and the Kolkheti lowlands. NEAPG (2012-2016) reports that total forest stock amounts to 430 million m³ and that the average annual forest stock growth is about 4.0 million m³. The same source questions the reliability of these data as no forest inventory has been carried out in Georgia in the past 30 years. This information is crucial in allowing for management of forest resources in Georgia.

The forestry sector and the ecosystem services that flow from forests have been recognized in the current programme of government, which states "...The mechanisms of sustainable use of land resources will be worked out, for soil erosion reduction, prevention of desertification and preservation of soil fertile layer; the complex of actions required for protection and maintenance of biodiversity will be performed, modern methods will be implemented in forestry ...". Of the eleven themes of the upcoming NBSAP - 2 identifies forest biodiversity as one of the components. Furthermore, at the Pan European level, the 2020 Strategy for biodiversity identifies forests as one of the thematic actions that need to be taken as part of to prevent further loss of biodiversity in the pan-European region, in line with the global biodiversity targets (UNEP, 2012)

In July 2011, the Ministry of Energy and Natural Recourses (currently Ministry of Energy) launched new forest reforms. One of the key elements of the reform was to allocate forest areas for a *long-term lease* (up to 49 years, with an exclusive right to further prolong the lease). A lease-holder will be granted the right to extract not only timber resources but also minerals; furthermore, a lease-holder can create fishing/hunting farms and tourist infrastructure, and set aside land for agricultural purposes. According to the draft law, clear-cutting is allowed in natural forests, and there is no prohibition on cutting forests on steep slopes (greater than 35° incline). This reform has made the expansion of existing protected areas or the creation of new ones in forest areas especially difficult (Matcharashvili, 2012).

One of the most serious problems in the forestry sector is unsustainable, often illegal, logging. Although in recent years the volumes of illegal logging have significantly dropped, they still remain at unacceptable levels. Officially, the total volume of illegal logging has been reduced to as little as 7,339 m³ in 2011. In reality, however, this figure is in the order of hundreds of thousands, or even millions of cubic meters per year (Matcharashvili, 2012; NBSAP-2, forthcoming). The actual volumes of logging substantially exceed the levels of natural growth capacity of forests located near population centers. As a result, these forests are severely devastated - the canopy cover has reached critically low thresholds (less than 50%) in more than 55% of forest area (NBSAP-1, 2005).

Over-grazing by livestock (cattle, sheep, goats and pigs) is another challenge in the forestry sector in Georgia. In certain locations (near settlements, in winter pastures, etc.) grazing is often shifted to nearby forests. In combination with unsustainable logging, excessive grazing can cause severe damage to forest ecosystems. The main causes of over-grazing are limited control from the state authorities, rural poverty, limited alternative livelihood opportunities, improper range management, and a lack of awareness in shepherds and livestock owners. For many families, livestock keeping is almost exclusively the sole source of livelihood. Unsustainable range management practices (e.g. the concentration of livestock in relatively small areas, failure to use pasture rotation systems, no restoration of degraded pasture land, etc.) as well as the lack of support (subsidies, small grants, favorable-term loans, extension services) further aggravate the problem (NBSAP-2, forthcoming).

Unsustainable hunting and poaching are also prevalent in Georgia, negatively affecting biodiversity of forest fauna. The numbers of large herbivores have dropped dramatically in the past century due to poaching and overhunting. At present, control mechanisms to reduce poaching are not effective, while

administrative resources for enforcement are limited. Government agencies are responsible for setting quotas for game species. There is no reliable information about the numbers of individuals, which puts the animal populations under great risk (NBSAP-2, forthcoming).

Infrastructure development is a relatively new threat to forest biodiversity. Rapid economic recovery and growth will trigger large-scale infrastructure development in Georgia in the coming years (NBSAP-2, forthcoming). These include new pipelines, dams, power lines, railways, mining facilities, roads, and buildings.

In these conditions, careful planning and sufficient consideration of ecological aspects are essential. However, the awareness of and consideration by decision-makers of real values and importance of forest biodiversity is not sufficient at present. As a result, there is significant risk of losing some forest areas due to infrastructure development activities. The clearance of even relatively small forest area could cause irreversible damages if this forest is located within ecological corridor or other environmentally sensitive area. The causes of this problem can be summarised as follows:

- Rapid economic growth and tourism development;
- Pressure for decision-making in short time frames;
- Insufficient knowledge and consideration of ecological values, underestimation of economic consequences of the destruction of natural ecosystems.

4.4.2. Governance

From 2011-2013 (May) State forests (except protected forests) were governed by the Agency of Natural Resources (a legal entity under the MENR). The agency had many different tasks: all functions related to natural resources (hunting, fishing, timber and non-timber resources and minerals) are concentrated in this Agency (policy/legislation development, protection, monitoring/controlling of licenses and permits) (Matcharashvili, 2012 (2). Agency of Natural Resources was abolished since May 2013 and currently State forests (except forests of protected areas) are managed by Forest Agency (a legal entity under the Ministry of Environment and Natural Resources Protection)¹⁵.

Agency of Protected Areas (a legal entity under the Ministry of Environment and Natural Resources Protection) is responsible for the management of protected areas (I-IV IUCN categories: Strict Nature Reserves, National Parks, Nature Monuments and Managed reserves. www.apa.gov.ge)

4.4.3 BAU: Impacts and dependencies

The country's forests are an important source of energy: more than 80% of rural households in the country use fuel wood extracted from nearby forests for heating and cooking (EPR, Georgia, 2010). In addition, many people living near forests today still use timber as building materials. Forests provide commercial timber for domestic markets, in particular construction and furniture. The country also supplies timber to international markets in neighbouring countries including Armenia, Azerbaijan, Turkey and Iran.

In addition to timber and firewood production, forests in Georgia serve multiple environmental purposes: they serve as a habitat for wildlife and carbon sinks, prevent soil erosion and landslides, and they provide watershed management. Georgian forest ecosystems also produce a great variety of non-timber forest products (NTFPs) such as fruit, berries, nuts, mushrooms, medicinal plants, honey and decorative plants. Many of these products are a common component of the diet of the rural population. These products are also marketed to generate supplemental income for rural households (Foster-Turley & Gokhelashvili, 2009).

Forests also play a critical role in the formation of drinking water resources in Georgia. In many rural areas, especially in the mountains, natural springs are the primary source of drinking water supply. Cities also depend on forests for water. For example, Batumi, the largest city on the Black Sea coast of Georgia with a

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population of 180,000 (2008 census), hosting more than a million tourists annually, receives drinking water from the Mtirala National Park (MNP) (Flores & Adeishvili 2011).

Georgia's forests are being degraded by overgrazing and unsustainable logging (NBSAP-2). Forest degradation and fragmentation are further exacerbated due to institutional gaps in the governance of forest stocks. A forest policy is crucial for establishing a clear vision for forests and for creating signposts and milestones for achieving the vision. The legal boundaries of the forest fund¹⁶ and tenure over substantial parts of the forest fund are unclear, creating uncertainty as to where forest law applies.

Legal and technical problems exist with respect to the establishment of community and communal (municipal) forest management systems. Although the Forest Code (1999) states that the Local Forest Fund should 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 (Matcharashvili, 2008). Furthermore, local self-governing bodies are not ready to take over the responsibility for forest management, mainly because they lack funding, capacity and experience (*ibid.*); The potential constituency of Local Forest Fund members comprises in the main those involved in former collectives located near population centres.

At present, the extraction of non-timber resources (such as food items, medicinal and decorative plants) is not regulated. Moreover, assessments of the status of these resources are not yet complete. Accordingly, rare, endemic and endangered species are not fully protected by law. There are no data about levels of production or on the potential impact of this activity on populations. The only exceptions to this cover the extraction of fir-tree cones, snowdrop bulbs and cyclamen balls (Fourth National report to CBD, Georgia).

Infrastructure development is a relatively new threat to forest biodiversity. Rapid economic recovery and growth is expected to trigger large-scale infrastructure development in Georgia in the coming years (NBSAP-2, forthcoming); these include new pipelines, dams, power lines, railways, mining facilities, roads, and buildings.

4.4.4 Alternative policy options - SEM

Policy priorities, principles and criteria for sustainable forest management have been outlined in a number of international agreements and processes. Examples include – “Statement on Forestry Principles” (adopted in Rio de Janeiro in 1992), Expanded Programme of Work on Forest Biodiversity (within the Framework of the Convention of Biological Diversity (CBD), Forests Europe, and voluntary forest certification systems. Adequate protection of forests whilst simultaneously obtaining the maximum benefits from forests in a sustainable way (i.e. multipurpose management) requires the flexible categorization (functional zoning) of forests. The present Georgian forestry legislation and management standards cannot adequately provide for multipurpose forest management and functional zoning.

The CBD Secretariat suggests the following to achieve Aichi targets (CBD strategic plan 2011-2020):

1. By 2014, national legislation and land use plans or zonation maps have been reviewed and updated in relation to national targets for the maintenance of natural habitats, and spatial planning tools are made available for wide use;
2. By 2014, additional measures are taken, as necessary, including for example for the enhancement of land tenure, the enhancement of law enforcement and the use of incentive measures.
3. Apply existing criteria for sustainable forest management (e.g. the Forest Europe criteria and indicators; 2003) and forest level operational guidelines.
4. Enhance customary use of biodiversity by indigenous and local communities by increasingly delegating governance and management responsibility to the local level.
5. Promote the use of certification and labelling systems or standards.

¹⁶ According to Forest Code of Georgia (Article 5, paragraph “c”) “Georgian Forest Fund is integrity of forests and their resources owned by the State Forest Fund and forests under different types of ownership” (official translation)

The SEM strategy for forestry includes all items (1-5) above with the following additional elements:

1. Establish 'protected', 'protective' and 'other' forest classes using SEA
2. Ensure that all harvesting of forest resource in 'protective' and 'other' is sustainable through management, monitoring and enforcement
3. Transfer of some rights to local communities (ownership rights of some forests; hunting rights)
4. Enlargement of forestry PAs and establishment of biodiversity corridors

The strategic zoning of Georgia may be carried out in accordance with MCPFE classes (see Forest Europe, Vienna resolution IV). This can support the protection of forests with high conservation value and sustainable use of productive forests. In BAU, without strategic zoning, forests with high conservation value will be downgraded – potential new protected areas might be treated as regular forests, creating barriers for establishment of new protected areas.

4.4.5 Ecosystem service change analysis for forest sector

Table 4 illustrates how the environment and ecosystem services will be affected in BAU scenario and how provision of these services is projected to change if the proposed SEM policy elements are implemented in Georgian forestry sector.

Table 5 Summary of ecosystem service change for forestry sector

Main service-types	Impact on ESS		Description
	BAU	SEM	
PROVISIONING SERVICES			
Food (e.g. fish, game, fruit)	↓	↑	BAU ↓ (i) Deforestation decreases habitat extent and quality for game (ii) Decrease in livestock through increased predation from wolves, bears etc. (iii) Deforestation decreases extent of pasture because of soil erosion SEM ↑ (i) With sustainable forestry there is a higher carrying capacity for game which increases game meat availability (ii) Increase in edible NTFP (mushrooms, berries etc.) (iii) Less predator-livestock conflict (iv) Trends in BAU for soil erosion and over-grazing are mitigated, therein increasing food production (v) Populations of game species increasing because of improvement of habitat quality (corridors, etc.)
Water (e.g. for drinking, irrigation, cooling)	↓	↑	BAU ↓ (i) Forests have a water retention function which is reduced with increased deforestation (ii) Mineral water availability affected directly (iii) Less freshwater for irrigation of crops SEM ↑ (i) Less deforestation implies greater water retention (ii) BAU impacts mitigated
Raw Materials (e.g. fibre, timber, fuel wood, fodder, fertilizer)	↑	↑	BAU ↑ Forests density is decreased through deforestation; amount of timber, fuel wood and other raw materials increases in the short term but then declines due to deforestation/habitat depletion SEM ↑ Sustainable forest management implies less deforestation, forest resources harvested sustainably
Genetic resources (e.g. for crop-improvement and medicinal purposes)	↓	↑	BAU ↓ Genetic resources in forest ecosystems reduced due to unsustainable forestry practices and deforestation SEM ↑ More genetic resources owing to sustainable forest management and reduced deforestation

Medicinal resources (e.g. biochemical products, models & test-organisms)	↓	↑	BAU ↓ Medicinal resources are under threat of depletion SEM ↑ Medicinal resources which depend of healthy forest ecosystems conserved and harvested sustainably. Local communities are incentivized to care about these resources.
Ornamental resources (e.g. artisan work, decorative plants, pet animals, fashion)	↓	↑	BAU ↓ Ornamental resources are lost due to overexploitation of forest ecosystems SEM ↑ Forests are protected due to establishment of new PAs and wildlife corridors
REGULATING SERVICES			
Air quality regulation (e.g. capturing (fine)dust, chemicals, etc)	↓	↑	BAU ↓ Air quality decreased due to deforestation/forest degradation SEM ↑ Air quality increased as a result of conservation efforts
Climate regulation (incl. C-sequestration, influence of veg. on rainfall, etc.)	↓	↑	BAU ↓ Deforestation is one of the important causes of climate change SEM ↑ Climate change mitigated due to better protection of pristine forests, establishment of protected areas, reforestation and other silvicultural activities.
Moderation of extreme events (e.g. storm protection and flood prevention)	↓	↑	BAU ↓ Landslides and other extreme events are more frequent SEM ↑ Better forest management (zoning) helps prevent erosion and landslides, and mitigate their impacts
Regulation of water flows (e.g. natural drainage, irrigation and drought prevention)	↓	↑	BAU ↓ Deforestation can decrease capacity of forest ecosystem to regulate water flow SEM ↑ Sustainable forestry, zoning and PA regulations can help to regulate water flow
Waste treatment (esp. water purification)		↑	BAU ↓ Deforestation can decrease capacity of forest ecosystem to treat water SEM ↑ Better forestry practice and PA regulations
Erosion prevention	↓	↑	BAU ↓ Soil erosion due to deforestation and unsustainable grazing in the territory of forest fund SEM ↑ Better forest management (zoning) helps prevent soil erosion
Maintenance of soil fertility (incl. soil formation)	↓	↑	BAU ↓ Unsustainable forestry practice and overgrazing damages the forest soil and negatively impacts soil fauna and flora SEM ↑ Better forest management (zoning) helps prevent soil degradation
Pollination	↓	↑	BAU ↓ Habitat of important insects depleted due to unsustainable forestry practice SEM ↑ Habitat of important insects protected due to sustainable forestry practice and new PAs
Biological control (e.g. seed dispersal, pest and disease control)	↓	↑	BAU ↓ Forests are degraded because of poor forest management / pest and disease control SEM ↑ Biological control improved because of better conservation of forests
HABITAT SERVICES			
Maintenance of life cycles of migratory species (incl. nursery service)	↓	↑	BAU ↓ Populations of mammal species under the threat because of habitat fragmentation SEM ↑ Habitats restored and migration routes protected because of zoning and establishment of ecological corridors
CULTURAL SERVICES			
Aesthetic information	↓	↑	BAU ↓ Deforestation, erosion, landslides SEM ↑ New PAs, zoning

Opportunities for recreation & tourism	↓	↑	BAU ↓ Opportunities for recreation & tourism decreased SEM ↑ Opportunities for recreation & tourism increased (new PAs, community based enterprises developed)
Inspiration for culture, art and design	↓	↑	BAU ↓ Deforestation, erosion, landslides SEM ↑ New PAs, community-based enterprises developed
Spiritual experience	↓	↑	BAU ↓ Deforestation, erosion, landslides SEM ↑ New PAs, community based enterprises developed

4.4.6 Conclusions

Significant problems remain for the development of sustainable forestry: legal and institutional gaps; insufficient financial resources; the distribution of roles and responsibilities between central and local authorities; the absence of a forest inventory and monitoring systems; lack of knowledge and experience in sustainable forest management; insufficient information on the state of forest resources; and absence of forest management standards which are in compliance with the requirements of sustainable development/best international practice. The rationale for the analysis of this sector was to determine the change in ecosystem service provisioning under a scenario (SEM) where some (but not all) of these problems might be addressed in a feasible policy strategy package.

The initial analysis shows that in the BAU scenario, provisioning is expected to decline for most of the ecosystem services leading to social, cultural, economic and environmental losses. In a similar vein to the agricultural sector case study, the lack of weighting for the significance of impacts (and implicit equal weighting) can be misleading in that the provisioning services are likely to be disproportionately significant owing to changes in extraction of timber ('raw materials') and NTFP ('food', 'medicinal resources' and 'ornamental resources'). Further, timber is likely to dominate in this subset of services.

So again it is important to carry out the full valuation-based TEEB appraisal to provide the complete evidence-base for the appraisal of BAU versus SEM, but forestry differs from agriculture: 'food' is clearly the dominant service for agriculture whereas forests are truly multi-functional and deliver a wider array of ecosystem services. In fact their capacity to provide watershed management may dominate timber value in some cases, and in the developed world recreation and leisure values are typically huge (see TEEB 2010a).

Thus even in the absence of a full TEEB appraisal using valuation, there is a high degree of confidence around the key messages for the sector below:

1. Forests provide a very wide array of ecosystem services and this provisioning of services is significantly threatened under BAU and extant government policies and proposals
2. Unsustainable logging is rife and improving governance structures (and resourcing thereof) is likely to lead to 'quick wins'. This includes defining the roles and responsibilities (and jurisdictions) of local and national government clearly
3. There are perverse subsidies for forestry encroachment and these should be addressed
4. Timber harvesting should be permitted and thrive but in well-defined zones: a need to establish 'protected', 'protective' and 'other' forest classes using SEA
5. Ensure that all harvesting of forest resource in 'protective' and 'other' is sustainable through management, monitoring and enforcement
6. Given the myriad benefits of forest PAs, enlarge current PAs and establish biodiversity corridors
7. Transfer some rights to local communities (ownership rights of some forests; hunting rights)

Part V: Conclusion and way forward

This final chapter of the scoping study provides the reader with a summary of findings from the sectoral analyses conducted as part of this scoping study. It concludes with providing guidance on implementing a full TEEB for Georgia, its deliverables, and a work plan for the same.

5.1 Sector findings: summary and recommendations

The above analyses show the critical importance of healthy ecosystems to the functioning of Georgia's important economic sectors. The analyses also highlight that if business as usual is not changed, the sustainability of these sectors is questionable. Alternative scenarios however show that changing the course of these sectors is possible and may lead to multiple benefits for people.

For the hydropower sector, while expansion under BAU may lead to high economic returns in the short-term, there needs to be a comprehensive evaluation of the impacts of such an expansion on both ecosystem services that are critical to local communities, and to the sustainability of the sector itself in the long-term. While mechanisms for EIA exist, project-level EIA may be problematic in its current sequence, where the MOU for project implementation precedes the EIA. Moreover, the benefits of hydropower development are highly concentrated and are not diffused to local communities; instead the rural poor are subject to higher threats to their livelihoods as critical resources such as forests and agricultural land are encroached upon. To ensure that these issues are addressed, and that Georgia's energy policy is informed at a broader level, the scope may be broadened to look at other energy sources as well. To this end, a **TEEB study to inform the Environmental Impact Assessment process may be undertaken to inform Georgia's energy policy for considering both environmental and distributional impacts of energy development in Georgia.** It would ask the following questions:

1. Examine and quantify, wherever applicable, the biodiversity and ecosystem services impacts and dependencies of the energy sector in Georgia, particularly hydropower;
2. Suggest means and sequencing of integrating this information in EIA in energy projects;
3. Look at other ways, beyond EIA, of integrating this information into energy policy making (such as biodiversity offsets, investment decisions, subsidies for specific technologies, and research and development);
4. Any specific recommendations for energy development may be accompanied by recommendations for policy instruments; and
5. Policy instruments may be assessed on the basis of distributional, economic, social and environmental impacts.

The tourism sector is one of the fastest growing sectors in Georgia. There have however, been adverse impacts of tourism on ecosystems. Some of these include, habitat loss due to land encroachment, waste generation, and water quality impacts. Moreover, some of these adverse effects from uncontrolled expansion in tourism may negatively impinge upon the tourist experience (e.g. untreated sewage affecting bathing water quality; soil erosion from off-road vehicles making pathways and roads impassable; draining coastal wetlands which can increase the prevalence and intensity of storm events; unregulated waste disposal implying plastic litter in otherwise pristine nature spots). **TEEB for sustainable tourism Georgia therefore may be undertaken to better inform tourism planning and development (zoning, protected area management), and it identify opportunities and threats for long-term sustainable tourism.** It would ask the following questions:

1. Examine and quantify, wherever applicable, the biodiversity and ecosystem services impacts and dependencies of the tourism sector;
2. Examine ways to internalize this information in tourism policies (such as land acquisition, eco-tourism, and community led tourism development etc.)
3. Any specific recommendations for land use and planning may be accompanied with policy instruments to attain these goals; and
4. Policy instruments may be assessed on the basis of distributional, economic, social and environmental impacts

Agriculture employs 53% of the Georgian workforce (National Statistics Office of Georgia, Government of Georgia). However, within agriculture, the drive to intensification might impact upon genetic diversity and thus long-term economic profitability (and viability) of the sector. Land degradation due to salinization and erosion are some of the many issues that challenge the long-term sustainability the agricultural sector. Hence there is a risk of reducing long term crop yields if incentives are not provided for moving towards, for example, limited pesticide and chemical fertilizer use, biological pest control, soil conservation techniques, water use efficiency, food safety, crop rotation, and farm diversification. **TEEB for Agriculture Georgia may be undertaken to inform agricultural policies in Georgia to ensure food security and prevent land degradation (subsidy reform, organic agriculture development, certification, and pastoral management).** It would ask the following questions:

1. Examine and quantify, wherever applicable, the biodiversity and ecosystem services impacts and dependencies of the agricultural sector;
2. Examine ways to internalize this information in agricultural policies (such as subsidy reform, research and development, pasture land management, and organic agriculture)
3. Any specific policy recommendations may be accompanied with policy instruments to attain these goals; and
4. Policy instruments may be assessed on the basis of distributional, economic, social, and environmental impacts

Forests cover around 40% of Georgia and are a source of livelihoods for the rural population. Furthermore, they provide habitat for a significant part of Georgia's biodiversity. Forests however are under threat from deforestation and land encroachment. This may adversely impact rural communities who rely on forest services such as firewood, non-timber forest products, habitat services, and freshwater. **A TEEB for sustainable forestry management may be undertaken for Georgia, identifying ways to maximize the benefits of forests through measures such as sustainable forestry, zoning, and changes in land tenure arrangements.** It would ask the following questions:

1. Examine and quantify, wherever applicable, the biodiversity and ecosystem services impacts and dependencies of the forestry sector;
2. Examine ways to internalize this information in existing forestry policies (such as licensing, protected area management, and forest management);
3. Any specific recommendations for land use planning may be accompanied with policy instruments to attain these goals; and
4. Policy instruments may be assessed on the basis of distributional, economic, social, and environmental impacts

TEEB for the mining sector may also be undertaken as part of the full TEEB study. While mining has brought revenues to Georgia, it has also resulted in adverse impacts on water and soil quality. Stakeholders have expressed a strong interest in this sector and while sustainable mining is not part of the sectoral analyses presented in this scoping report, **TEEB for sustainable mining may be undertaken as part of the full TEEB study.** It would ask the following questions:

1. Examine and quantify, wherever applicable, the biodiversity and ecosystem services impacts and dependencies of the mining sector;
2. Examine ways to internalize this information in existing mining policies (such as licensing);
3. Any specific recommendations for changing business as usual may be accompanied with policy instruments to attain these goals; and
4. Policy instruments may be assessed on the basis of distributional, economic, social, and environmental impacts.

A synthesis report may also be part of the TEEB study. It would summarize sectoral policy recommendations, but also provide findings from cross-sectoral initiatives that relate to TEEB and its

recommendations. For example, natural capital valuation has emerged as an important exercise for stock taking of a country's natural assets. There are strong synergies between World Bank's project on Wealth Accounting and Valuation of Ecosystem Services (WAVES) and TEEB and these can be utilized during this project (Annex VII).

5.2 Way forward: TEEB for Georgia

A full TEEB study for Georgia comprising the five sectoral studies may be carried out in discussion with stakeholders. The study would focus on identifying and valuing ecosystem services that are instrumental in answering questions highlighted in the previous section. It is critical to agree on these needs at the beginning of the process. The individual steps, taking into account the results of this scoping study, would be as follows:

- Step 1: Further consult relevant stakeholders and find agreement on outcomes of the full TEEB study;
- Step 2: If needed, further define which ecosystem services are most relevant given the results of the scoping study and within the context of the decision-making problems identified above;
 - For example, regular fresh water flows is an ecosystem service critical for the development of the hydropower sector in Georgia.
- Step 3: Define information needs and select appropriate methods for the specific situation of Georgia. The scoping study has already pointed some areas of weakness concerning information and data and these should be addressed early on;
- Step 4: Undertake the actual assessment of ecosystem services, possibly, but not necessarily, by monetary valuation;
- Step 5: Look at possible policy responses and the policy instruments at hand, some of which have been preliminarily reviewed in the scoping study;
- Step 6: Assess distributional impacts and implications for poverty alleviation in Georgia.

5.2.1 Governance architecture

The following groups may compose project governance architecture for undertaking TEEB for Georgia (Guidance Manual for TEEB Country Studies, Version 1.0, 2013).

Steering (coordination) group/ Project Advisory Group: This group will take decisions to guide the study, ensuring that the project is delivered to meet its agreed objectives. It may guide the study to focus in the right areas, but it should not seek to influence the actual results, to maintain independence. The steering group may have representatives from donor agencies and from mine ministries. For Georgia, the current Project Advisory Group may fulfill this role with a renewed mandate to oversee future TEEB activities.

Expert Panel: This group may be composed of experts from relevant disciplines who would lead in the design and review of technical aspects of the study. This type of group can provide specific input (scientific, policy, and stakeholder), quality assurance, help develop key messages and facilitate outreach and communication to the scientific community.

In the international TEEB initiative, the advisory board was composed of experts from different sectors, not only science. This opens the possibility for the board to contribute to outreach, coordination with other relevant strategic decisions.

Author Teams: Author teams are often partnerships of organisations or individuals, and it is this group which undertake the technical work within the study as outlined in the design of the study. This can be complemented by a call for evidence, workshops, and special sessions at events that gather relevant stakeholders and/or expertise. Authors can come from a range of agencies and can include government departments/ministries, independent consultancies, universities and other academic organizations. Author

teams that bring together individuals from different organizations can bring different perspectives, build important capacity, and establish new contacts to assist in dissemination of study findings.

Peer reviewers and Review editors: A mix of national and international peer reviewers may be selected to revise and review the study. Reviewers must be independent. It may also be useful to have review editors for each of the sectoral reports suggested in this scoping study. Furthermore, all reviewers should be involved as early as possible and, should review the ToR of the study. It is also worth considering ongoing review that occurs during the study process, including reference to the UNEP TEEB technical team, thereby providing guidance as progress is made and not only at the start and end. Once the review process is complete, its outputs and findings can be used to refine the study (or even make major changes if needed) and conclude it.

5.2.2 Implementation plan

A tentative implementation plan is presented below (subject to funding and agreement with focal ministry).

Table 6 - Implementation plan (TEEB for Georgia)

Activity	Activity details	Outputs	Agencies responsible	T=0	T + 1 month	T + 2	T + 3	T + 4	T + 6	T + 8	T + 10	T + 12	T + 14	T + 15	T + 24	T + 26	T + 30
Launch of TEEB Scoping Study	Conduct a high level launch event of scoping study	Press release	Focal ministry/ MoENRP														
Establish steering/ advisory group/ (or renew mandate of existing Project Advisory Group)	Invite members from donor agencies and line-ministries to form Steering group and sign MoU with terms of reference that broadly outlines roles and responsibilities of the steering group	List of members of Steering/ Advisory Group and signed MoU between MoENRP and steering/ advisory group	Focal ministry/ MoENRP														
Appoint- ment of Study Chair	Nominate and appoint a study chair (the study chair would ideally head the Project Advisory Board)	Study chair	MoENRP and Steering Group														
Establish Expert Panel*	Invite technical experts from academia, NGOs, and TEEB community and sign MoU with terms of reference that broadly outlines	List of members of Expert Panel and signed MoU between MoENRP and Expert Panel	Focal ministry. MoENRP														

Activity	Activity details	Outputs	Agencies responsible	T=0	T+1 month	T+2	T+3	T+4	T+6	T+8	T+10	T+12	T+14	T+15	T+24	T+26	T+30
	roles and responsibilities of the Expert Panel	Press release	Focal ministry/ MoENRP														
Appoint reviewers for deliverables	Appoint/contract two reviewers	List of 2 reviewers	Focal ministry/ MoENRP with support from UNEP TEEB Office														
Appoint – ment of Study Chair	Calculate budget, identify interim deliverables, including terms of reference for author teams/academic institutions/consultants, project reporting structure, timelines, and key donors for fundraising	Financial estimate for undertaking the full TEEB study and list of potential donors	MoENRP (with technical support from UNEP)														
Funding for TEEB Country Study (TCS)	Fundraising for TCS	Funds	Focal ministry/ MoENRP with support from UNEP and UNEP-TEEB Office														
Author team and communication team selection	Release Request For Proposals/ Expression of Interest to get author teams/academic institutions/consultants and communication teams on board (through competitive bidding or nomination).	Contract between MoENRP and author/ academic institutions/ consultants and communication teams	Focal ministry/ MoENRP														
	Sign contract with author teams/ academic institution/consultants		Focal ministry														
TEEB Country Study	Refine the objectives of the TCS if necessary (as identified in the scoping phase)		Author team/ academic institutions/consultants														

Activity	Activity details	Outputs	Agencies responsible	T=0	T + 1 month	T + 2	T + 3	T + 4	T + 6	T + 8	T + 10	T + 12	T + 14	T + 15	T + 24	T + 26	T + 30
	Identify the most relevant ecosystems and ecosystem services cross checking against the scoping study		Author team/ academic institutions/ consultants TEEB Office														
	Define information needs and select appropriate methods		Author team/ academic institutions/ consultants														
	Assess and value ecosystem services		Author team/ academic institutions/ consultants														
	Identify and outline pros and cons of policy options and instruments, including distributional impacts		Author team/ academic institutions/ consultants														
Peer review	Send TCS for peer review	Inputs of review team	Focal ministry/ MoENRP														
Stakeholder input	Send to stakeholders for validation	Validation of scoping report from stakeholders	Focal ministry; Steering group; Expert Panel; other line-ministries and author team/ academic institutions/ consultants														
Revise	Incorporate comments	Final TEEB Country Study	Author team/ academic institutions/ consultants														
TEEB Advisory Board (TAB) review	UNEP-TEEB to send TCS to TEEB Advisory Board along with approval form	Approval from TEEB Advisory Board	UNEP-TEEB Office														
Launch final report	Launch report on the margins of a regional conference/ event	Press release of launch	Focal ministry/ MoENRP; author team/ academic institutions/ consultants, and UNEP - TEEB Office														
Communication and awareness building	Regular newsletters and blogs to maintain momentum of TEEB process	Newsletter and blogs	Focal ministry/ MoENRP														

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Annexes

Annex I: Valuation exercises done thus far in Georgia

S. No	Date	Name	Results	Link/ Reference
1	1999-2000	<p>The World Bank initiated a series of surveys exploring the revenue generation potential of national parks to be established under the Protected Areas Development Project (funded by the GEF, 2000-2008). These include:</p> <ul style="list-style-type: none"> Contingent Valuation Survey among Georgian City Dwellers: Attitudes, Preferences and Willingness to Pay for Biodiversity Conservation, 2000. Tourist Preferences for the Establishment of National Parks in Georgia, Survey Results for Expatriates Residing in Tbilisi, Georgia, 2000 	<ul style="list-style-type: none"> Urban residents of five urban areas surveyed would derive an estimated 3.5 million Georgian Lari (2.15 mln USD) annually in non-use value from improved biodiversity protection. The recreational value that Georgian city dwellers would derive from visiting national parks was estimated at 2.7 million GEL (1.7 mln USD) annually. According to the Survey Results for Expatriates Residing in Tbilisi (2000) the average willingness to pay for entering a Georgian National Park was 21.5 GEL (13.2 USD). The average amount that respondents were willing to pay per day to enter a Georgian National Park was 27.44 GEL. 	<p>Contingent Valuation Survey among Georgian city Dwellers: Attitudes, preferences and willingness to pay biodiversity conservation. A Study Prepared for the World Bank Georgia Protected Areas Development Project. Georgian Opinion Research Business International (GORBI).</p>
2	1999-2000	<p>The World Bank conducted a study of Benefits and Costs of Establishing the Kolkheti National Park, using total economic valuation (TEV) methodology. This approach accounts for all uses and services of wetlands that humans derive from them.</p>	<ul style="list-style-type: none"> The results of the benefit cost analysis showed that establishment of the park under baseline scenario would lead to significant net losses to the local communities. A socially and ecologically sustainable alternative was needed. The study results suggested that in this alternative scenario, limitations on resource use in the KNP should be less strict but within the limits of ecological sustainability. A compromise was needed between the needs to sustain local communities' livelihoods and to preserve the globally significant wetland resources for future generations, which in turn would help ensure that benefits to the local communities from resource use would be continuous. Based on the findings of this analysis some specific recommendations were presented to guide the preparation of the KNP Management Plan. 	<p>Contingent Valuation Survey among Georgian city Dwellers: Attitudes, preferences and willingness to pay biodiversity conservation. A Study Prepared for the World Bank Georgia Protected Areas Development Project. Georgian Opinion Research Business International (GORBI).</p>

3	2010-2011	<p>UNDP/GEF project Catalyzing the Financial Sustainability of Georgian Protected Areas System initiated a study on economic valuation of the Tusheti National Park and of the network of Georgian protected areas. The final report was titled Economic Valuation of the Contribution of Ecosystems in Protected Areas to Economic Growth and Human Well-Being in Georgia</p>	<p>• Fresh water supply form ecosystems of protected areas is critical to sustain agricultural outputs in Georgia.</p> <ul style="list-style-type: none"> • Rivers and streams originating in the Southern slopes of Great Caucasus Gorge on the territory of Tusheti Protected Areas (TPAs) and the neighbouring ecosystems play an important role in sustaining Georgia's wine productivity. • Pollinations services from and around protected areas (wild bees and other insects) and honey bees are by far the best way to pollinate fruits and crops successfully. • Protected areas are indispensable to sustain the economic benefits of tourism and nature-based tourism. • Investment in Sustainable Ecosystem management (SEM) nature-based tourism is minimal in the Borjomi-Kharaguli and Mtskheta-Mtianeti national parks. • Borjomi-Kharaguli National Park (BKNP) and other nearby forest ecosystems sustain aquifers that are the indispensable source of spring mineral water to support a large subsector of the economy in Georgia, the water bottling industry. • Although to date there is no emissions trading present in Georgia, PAs could be instrumental in helping Georgia to fulfilling potential forthcoming obligations towards UNFCCC, as well as EU, in the area of climate change and greenhouse gas emissions reduction if Georgia enters the EU pre-accession process in the future. • PAs under SEM can contribute to poverty alleviation and equity. • Ecosystems of protected areas such as TPAs, BKNP and Mtskheta-Mtianeti National Park (MNP) are economically important for subsistence agriculture in the highlands and lowlands. Nearly half of the Georgian population lives in rural areas and more than half are employed in the agricultural sector. • Grassland ecosystems provide indispensable support local livestock breeding and dairy production. • Forest management under BAU increases risk of landslides and hazards. • PAs are instrumental to increase income to local residents, and provide firewood and timber indispensable to local residents. 	<p>Tourist Preferences for the Establishment of National Parks in Georgia. Survey Results For Expatriates Residing in Tbilisi, Georgia. Prepared for World Bank by Tecsalt International Inc. Montreal, May 2000.</p>
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2000	A Preliminary Total Economic Valuation (TEV) of Georgian Forests was carried out by the World Bank in May–June 2000. Two reports were developed by the World Bank in 2003.	The study specifically indicated that the total value to Georgian society of timber and non-timber products and environmental services would be higher if increased logging was permitted under a program of environmentally sound management—rather than the value forests were providing under conditions of unenforced legal limits on timber extraction, and wasteful, environmentally unsustainable logging.	1. Legal, Institutional and Economic Background of Georgia's Forest Sector and General Principles of Total Economic Valuation Methods. URS Corporation Ltd (2003); 2. Worked Example of Forest Resources Economic Valuation for Oni Forest District for Forest Management Planning and Valuation Purposes in Georgia. URS Corporation Ltd (2003).
4 2011-2012	WWF Caucasus Programme Office under the Protected Areas for a Living Planet Programme implemented the 2012 Protected Areas Project – Caucasus Ecoregion (2012 PAP) part of which was an economic valuation study related to Borjomi-Kharagauli and Mtskheta-Mtianeti National Parks in Georgia. The study resulted in the report Valuation of the Contribution of Borjomi-Kharagauli and Mtskheta-Mtianeti National Parks Ecosystem Services to Economic Growth and Human Well-being		Valuation of the Contribution of Borjomi-Kharagauli and Mtskheta-Mtianeti National Parks Ecosystem Services to Economic Growth and Human Well-being in the Republic of Georgia. Prepared by Marlon Flores, Malkhaz Adeishvili for WWF Caucasus Program. February 2011.

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Annex IV: Objectives of a Scoping Study

Outcomes	Does this study deliver these	Comments
Objectives and thematic focus of the full TEEB study		
An understanding of the policy context within which your study falls	Yes	
Key thematic areas on which a full TEEB study will focus on	Yes	
Set of objectives for your study	Yes	
Set of key questions which the full TEEB study will aim to answer	Yes	
A list of outputs which will be delivered by the study (note: outputs can be delivered throughout the project not just at the end)	Yes	
Stakeholders		
A mapping of stakeholders and terms of engagement with them within the timeframe of the full TEEB study	Yes	
Knowledge base		
An overview of the state of knowledge on natural assets –their stock, state, changes and roles	Partially	
At least a rough overview of data availability and any potential knowledge gaps	Yes	
Process and Governance		
A governance structure with appropriate documentation in place in relation to their roles	Yes	
Workplan and milestones for full TEEB study	Yes	
Budget and resource mobilization plan	No	Further stakeholder discussions necessary
Communication strategy	No	Further stakeholder discussions necessary

Source: Guidance Manual for TEEB Country Studies, Version 1.0, 2013

Annex V: Classification of Ecosystem Services

Provisioning Services - ecosystem services that describe the material or energy outputs from ecosystems	Regulating Services are services that ecosystems provide by acting as regulators	Habitat or Supporting Services underpin almost all other services	Cultural Services include the non-material benefits people obtain from contact with ecosystems
Food: Ecosystems provide the conditions for growing food. Food comes principally from managed agro-ecosystems but marine and freshwater systems or forests also provide food for human consumption.	Local climate and air quality: Trees provide shade whilst forests influence rainfall and water availability both locally and regionally. Trees or other plants also play an important role in regulating air quality by removing pollutants from the atmosphere	Habitats for species: Habitats provide everything that an individual plant or animal needs to survive: food; water; and shelter. Each ecosystem provides different habitats that can be essential for a species' lifecycle.	Recreation and mental and physical health: Walking and playing sports in green space is not only a good form of physical exercise but also lets people relax.
Raw materials: Ecosystems provide a great diversity of materials for construction and fuel including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species	Carbon sequestration and storage: Ecosystems regulate the global climate by storing and sequestering greenhouse gases. As trees and plants grow, they remove carbon dioxide from the atmosphere and effectively lock it away in their tissues. In this way forest ecosystems are carbon stores.	Maintenance of genetic diversity: Genetic diversity is the variety of genes between and within species populations. Genetic diversity distinguishes different breeds or races from each other thus providing the basis for locally well-adapted cultivars and a gene pool for further developing commercial crops and livestock	Tourism: Ecosystems and biodiversity play an important role for many kinds of tourism which in turn provides considerable economic benefits and is a vital source of income for many countries. In 2008 global earnings from tourism summed up to US\$ 944 billion.
Fresh water: Ecosystems play a vital role in the global hydrological cycle, as they regulate the flow and purification of water. Vegetation and forests influence the quantity of water available locally	Moderation of extreme events: Ecosystems and living organisms create buffers against natural disasters, thereby preventing possible damage. For example, wetlands can soak up flood water whilst trees can stabilize slopes. Coral reefs and mangroves help protect coastlines from storm damage		Aesthetic appreciation and inspiration for culture, art and design: Biodiversity, ecosystems and natural landscapes have been the source of inspiration for much of our art, culture and increasingly for science
Medicinal resources: Ecosystems and biodiversity provide many plants used as traditional medicines as well as providing the raw materials for the pharmaceutical industry. All ecosystems are a potential source of medicinal resources	Waste-water treatment: Ecosystems such as wetlands filter both human and animal waste and act as a natural buffer to the surrounding environment.		Spiritual experience and sense of place: In many parts of the world natural features such as specific forests, caves or mountains are considered sacred or have a religious meaning. Nature is a common element of all major religions and traditional knowledge, and associated customs are important for creating a sense of belonging
	Erosion prevention and maintenance of soil fertility: Soil erosion is a key factor in the process of land degradation and desertification. Vegetation cover provides a vital regulating service by preventing soil erosion. Soil fertility is essential for plant growth and agriculture and well functioning ecosystems supply the soil with nutrients required to support plant growth		
	Pollination: Insects and wind pollinate plants and trees which is essential for the development of fruits, vegetables and seeds. Some 87 out of the 115 leading global food crops depend upon animal pollination including important cash crops such as cocoa and coffee (Klein et al. 2007)		
	Biological control: Ecosystems are important for regulating pests and vector borne diseases that attack plants, animals and people.		

Source: adapted from MA - Millennium Ecosystem Assessment (2005) '[Ecosystems and Human Well-being: Synthesis](#)', Island Press, Washington DC)

Annex VI: Biodiversity Offsets

TEEB in National and International Policy Making defines biodiversity offsets as: " 'measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented. The goal of biodiversity offsets is to achieve no net loss, or preferably a net gain, of biodiversity on the ground with respect to species composition, habitat structure and ecosystem services, including livelihood aspects.' (Adapted from BBOP, 2009). Furthermore, Biodiversity offsets are a major theme within international and regional policies (Table 8).

Table 7 - REFERENCES TO BIODIVERSITY OFFSETS IN MULTILATERAL POLICY AGREEMENTS ¹⁷ ¹⁸

CBD	COP-9	UNEP/CBD/COP/9/INF/29	BIODIVERSITY OFFSETS AND THE BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME (BBOP) ¹⁷
		IX/11 - Review of implementation of Articles 20 and 21 Annex: Strategy for resource mobilization in support of the achievement of the Convention's three objectives for the period 2008-2015	IV. STRATEGIC GOALS AND OBJECTIVES Goal 4: Explore new and innovative financial mechanisms at all levels with a view to increasing funding to support the three objectives of the Convention 4.2. To consider biodiversity offset mechanisms where relevant and appropriate while ensuring that they are not used to undermine unique components of biodiversity.
		IX - Protected areas	B. Options for mobilizing, as a matter of urgency, through different mechanisms adequate and timely financial resources for the implementation of the programme of work on protected areas 3. <i>Invites Parties to:</i> (a) Undertake completion of, as a matter of priority, country-level financial needs assessments, and develop sustainable financing plans including, as appropriate, a diversified financial portfolio, including innovative mechanisms, in accordance with Agenda 21, Article 20 of the Convention and relevant decisions of the Conference of the Parties, further exploring with full and effective participation of indigenous and local communities, and other relevant stakeholders and strengthened cross-sectoral linkages, as appropriate, the concept of payments for ecosystem services in accordance with applicable international law, taking into account the fair and equitable sharing of both costs and benefits of management of protected areas with indigenous and local communities, and other relevant stakeholders consistent with national legislations and applicable international obligations; and exploring the potential of biodiversity offsets as a financing mechanism;
		IX/26 - Promoting business engagement Annex: Framework of priority actions on business, 2008-2010	Priority area 2: Disseminate tools and best practice 5. In collaboration with relevant organizations and initiatives, such as the Business and Biodiversity Offsets Programme (BBOP), compile and/or make available: (a) case-studies; (b) methodologies; tools and guidelines on biodiversity offsets; and (c) relevant national and regional policy frameworks'
	COP-10	UNEP/CBD/COP/10/INF/27	BIODIVERSITY OFFSETS: A TOOL FOR CBD PARTIES TO CONSIDER, AND A BRIEFING ON THE BUSINESS AND BIODIVERSITY OFFSETS PROGRAMME ¹⁸
		X/21 - Business engagement	1. <i>Invites Parties:</i> (c) To identify a range of options for incorporating biodiversity into business practices that take into account existing developments under various forums, including relevant institutions and non-governmental organizations, such as the Business and Biodiversity Offsets Programme, the International Union for Conservation of Nature, the United Nations Environment Programme, the Biotrade Initiative of the United Nations Conference on Trade and Development, the World Business Council for Sustainable Development, the Organisation for Economic Co-operation and Development, Nippon Keidanren, the Business and Biodiversity Initiative initiated at the ninth meeting of the Conference of the Parties; 3. <i>Requests the Executive Secretary,</i> subject to the availability of resources and in collaboration with relevant organizations and initiatives, such as those mentioned in paragraph 1 (c) above: (c) To encourage the development and application of tools and mechanisms that can further facilitate the engagement of businesses in integrating biodiversity concerns into their work, such as, consistent and in harmony with the Convention and other relevant international obligations, certification, verification, the valuation of biodiversity and ecosystem services, incentive measures, biodiversity offsets, etc.;

¹⁷ BBOP. <http://www.cbd.int/doc/meetings/cop/cop-09/information/cop-09-inf-29-en.pdf>

¹⁸ <http://www.cbd.int/doc/meetings/cop/cop-10/information/cop-10-inf-27-en.pdf>

World Bank's International Finance Corporation (IFC)	Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (January 2012)	<p>Protection and Conservation of Biodiversity</p> <p>10. For the protection and conservation of biodiversity, the mitigation hierarchy includes biodiversity offsets, which may be considered only after appropriate avoidance, minimization, and restoration measures have been applied. A biodiversity offset should be designed and implemented to achieve measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity; however, a net gain is required in critical habitats. The design of a biodiversity offset must adhere to the “like-for-like or better” principle and must be carried out in alignment with best available information and current practices. When a client is considering the development of an offset as part of the mitigation strategy, external experts with knowledge in offset design and implementation must be involved.</p> <p>Natural Habitat</p> <p>15. In areas of natural habitat, mitigation measures will be designed to achieve no net loss⁹ of biodiversity where feasible. Appropriate actions include:</p> <ul style="list-style-type: none"> • Avoiding impacts on biodiversity through the identification and protection of set-asides; • Implementing measures to minimize habitat fragmentation, such as biological corridors; • Restoring habitats during operations and/or after operations; and • Implementing biodiversity offsets.
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Annex VII: TEEB, WAVES and United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEAA)

The Economics of Ecosystems and Biodiversity (TEEB)

TEEB synthesizes knowledge from ecology, economics, policy, and social sciences to provide recommendations to end users (namely national and local governments and businesses) to measure, value, and mainstream biodiversity and ecosystem services¹⁹ into their respective decision making processes.

Conventional economic aggregates generated through national accounting, such as GDP, do not reflect the extent to which production and consumption activities may be using up environmental assets and limiting the capacity for these assets to generate ecosystem services in the future. In the operating space of public policy, TEEB recommends reforms to, *inter alia*, public policies for subsidy reform, land use management, protected area management, investment in natural infrastructure restoration, and national accounting to include natural capital using the SEEA. These generic recommendations are being taken forward at the Country level by “TEEB Country Studies”, for which this TEEB Country Manual provides guidance.

Valuation is just one, albeit a very important, component of TEEB implementation. Furthermore, TEEB recognizes that valuation may not necessarily be monetary – the context of decision-making would determine which methods and what degree of monetary valuation is appropriate²⁰. TEEB recommendations emphasize the need to examine more than just values or prices, and therefore focus on other public policy instruments such as subsidies, investment in public goods/ ecological infrastructure, and poverty eradication incentives (TEEB 2011, TEEB, 2012²¹).

Wealth Accounting and the Valuation of Ecosystem Services (WAVES)

The World Bank’s Wealth Accounting and the Valuation of Ecosystem Services (WAVES) project aims to mainstream natural capital accounting in national accounting systems and policy analysis, including ecosystem services. To do this, WAVES generates demand and supports the institutional structure for implementation of the System of Environmental-Economic Accounting Central Framework²² (SEEA CF) described in more detail below.²³

A Policy and Technical Experts Committee was set up to provide guidance to WAVES on ecosystem accounting. The aim is to develop the relevant policy perspective for ecosystem management and governance and strengthen the national statistical system for measurement of the national economy and environment. During WAVES’ preparatory phase (January 2011 to June 2012), a global partnership and a multi-donor trust fund was established. Work plans were prepared for implementation of the natural capital perspective in five developing countries²⁴ and, following the Rio+20 Summit, plans to expand WAVES to other countries are under development. WAVES also works in close collaboration with the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEAA) to advance the SEEA implementation by countries.

United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEAA)

19 Ecosystem services are classified as provisioning, regulating, habitat, and cultural. TEEB (2012) *The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations*. Pp. 26. Edited by Pushpam Kumar. Routledge, Abingdon and New York

20 TEEB (2010) *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB*.

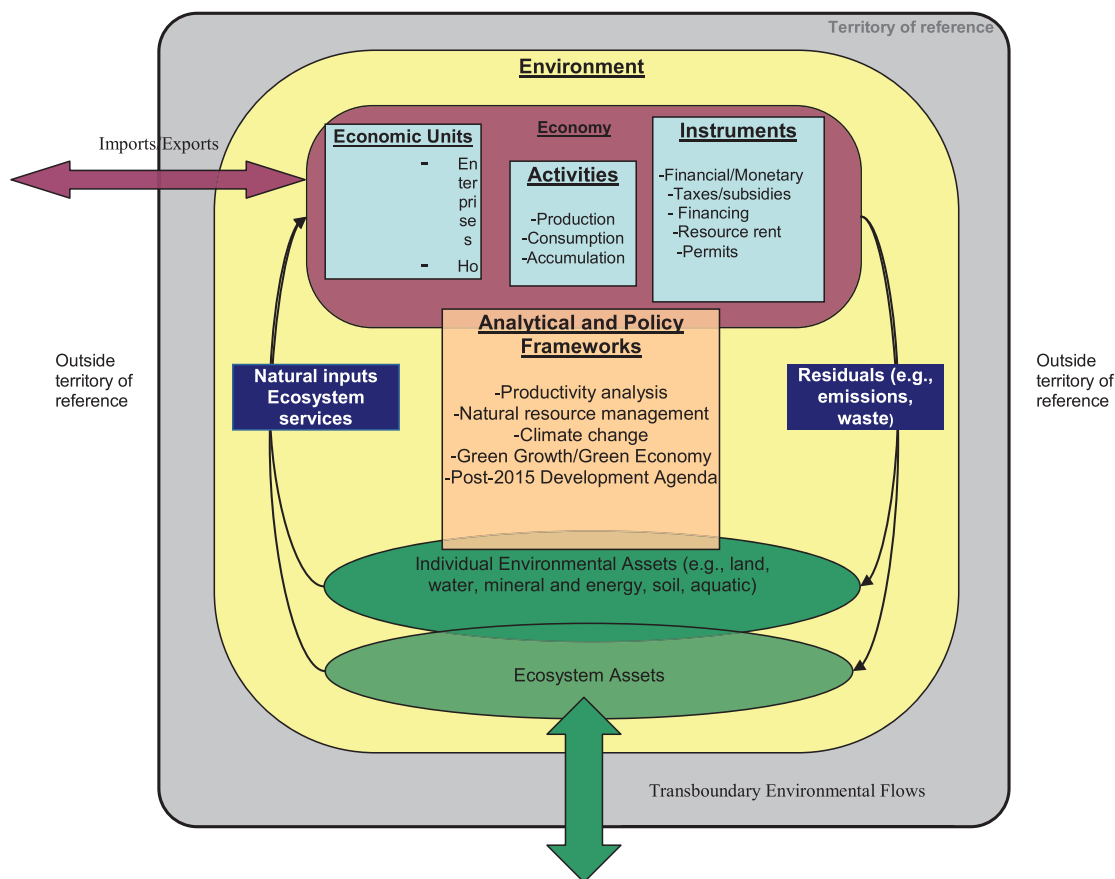
21 TEEB (2012) *The Economics of Ecosystems and Biodiversity in Local and Regional Policy and Management*. Edited by Heidi Wittmer and Haripriya Gundimeda. Earthscan from Routledge, Abingdon and New York.

22 http://www.un.org/esa/ffd/ecosoc/springmeetings/2012/Waves_Feb2012.pdf

23 The SEEA 2012 has been developed under the coordination and management of the UN Committee of Experts on Environmental-Economic Accounting (UNCEEAA), established by the UN Statistical Commission in 2005.

24 <http://www.wavespartnership.org/waves/about-us>

In 2013, the United Nations Statistical Commission adopted the flexible and modular implementation strategy²⁵ of the SEEA Central Framework and tasked the UNCEEA, with the United Nations Statistics Division as Secretariat, with its execution. The SEEA CF²⁶ is the international statistical standard, on par with the System of National Accounts and describes a multi-purpose conceptual framework (Figure provides a stylized representation of the relationships between economy and environment) for recording interactions between the economy and the environment. It used for economic data, for organising information on (a) individual environmental assets (such as water resources, timber resources, mineral and energy resources, aquatic resources, land and soil resources); (b) the flows of natural inputs and residual flows (e.g. emissions) between the environment and the economy and of products within the economy (for example, flows of energy, water and materials); and (c) economic transactions that can be considered environmental (such as environmental protection expenditure, environmental taxes and environmental subsidies). Approximately 50 countries have implemented various components of the SEEA CF.²⁷



SEEA Conceptual Framework

Recognizing the need for a consistent and complementary methodology for measuring ecosystems in a holistic manner and their linkages to economic and human activity, the SEEA Experimental Ecosystem Accounting (EEA)²⁸ extends the accounting principles of the SEEA CF to provide guidelines for recording both the material and the non-material benefits from the use of ecosystem assets (for example, benefits from the ecosystem services of water purification, storage of carbon, and flood mitigation).

²⁵ <https://unstats.un.org/unsd/statcom/doc13/BG-SEEA-Implementation.pdf>

²⁶ White cover publication available at http://unstats.un.org/unsd/envaccounting/White_cover.pdf. To be published by European Commission, Food and Agriculture Organization, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, World Bank.

²⁷ An assessment of environmental-economic accounting was conducted in 2006 and is available at: http://unstats.un.org/unsd/statcom/doc07/Analysis_SC.pdf. Since that time, additional countries have implemented components of the SEEA CF.

²⁸ <http://unstats.un.org/unsd/statcom/doc13/BG-SEEA-Ecosystem.pdf>

Selected modules of ecosystem accounting, in particular focusing on the measurement of carbon, nutrients, biodiversity, ecosystem services, and ecosystem condition, will provide, in due course, important indicators for policy analysis that complement the information from the SEEA CF.

Linking TEEB, WAVES and UNCEEA

TEEB (in its Interim Report, 2008, in Climate Issues Update, 2009 and in the Synthesis Report, 2010) recommended the development of natural capital accounts to improve the information base for decision making²⁹. As the UNCEEA, in consultation with WAVES and other partners, moves forward with national implementation plans and strategies for the SEEA CF, countries will start making progress toward this recommendation.

Objectives of TEEB Country Studies (i.e. not related to National Accounting) include framing new regulations, formulating changes to land-use planning, subsidy reforms, investment in ecological infrastructure, PA evaluation, setting up local and national PES schemes, etc). Developing coherent, multidimensional public policy goals requires a monitoring and reporting system that would benefit from the use of the SEEA framework. This approach reflects central themes from TEEB's eleven recommendations (see Annex 1) for decision-makers, including making nature's values visible, assessing value of ecosystem services and integrating these into decision making, and measuring better to manage better.

Following the TEEB approach requires questions to be asked – and answered – such as “What are relevant ecosystem services? From which biomes and ecosystems do they emanate? Whom do they benefit and to what extent?” These questions are also fundamental to the SEEA EEA conceptual framework. The process of attaining comparable answers to such critical questions will benefit from the adoption of a common conceptual framework, and the SEEA offers such a framework.

Multidimensional indicators regarding economic development and environmental sustainability are relevant in tracking country progress toward interdependent policy goals identified through the TCS process. The recent draft of SEEA CF Applications and Extensions³⁰ provides an overview of possible applications of SEEA data series and describes how the SEEA CF can support the development of environmental-economic indicators. The statistical framework provided by SEEA supported by the UNCEEA implementation strategy, the WAVES policy strategy and other global policy partnerships create a consistent structure for TEEB in advancing its recommendations at the national, regional and global levels.

29 TEEB (2010) The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB.
There are eleven recommendations of TEEB, two of which address economic valuation explicitly -
Make nature's values visible by assessing and communicating the role of biodiversity and ecosystem services in the economy and to society.

Assess the value of ecosystem services and integrate these into decision making – improving the evidence base for decisions

30 <http://unstats.un.org/unsd/statcom/doc13/BG-SEEA-AE.pdf>



Ministry of Environment
and Natural Resources
Protection of Georgia

moe.gov.ge



United Nations Environment Programme
unep.org



WWF-Caucasus
panda.org/Caucasus



The Economics of Ecosystems and Biodiversity
teebweb.org

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