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LAKE BAIKAL BASIN STRATEGIC ACTION PROGRAMME

2015

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The Baikal Basin. Satellite image map

LAKE BAIKAL BASIN
STRATEGIC ACTION PROGRAMME

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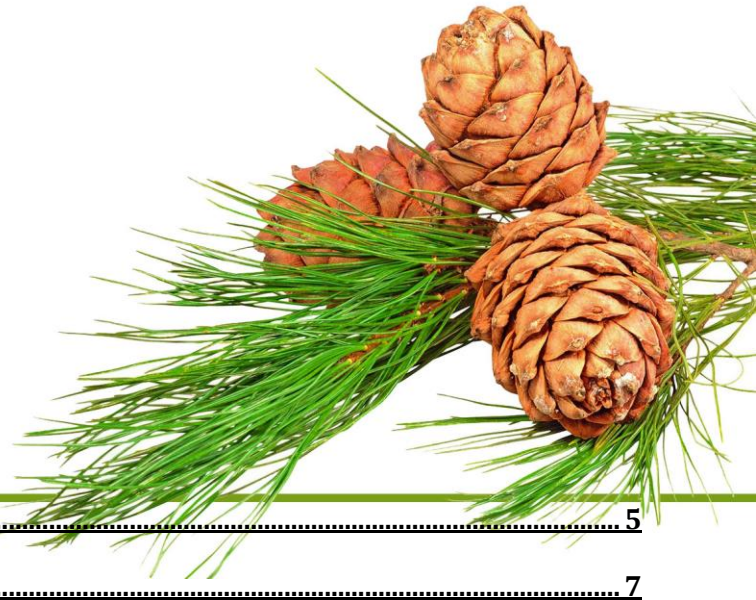

Contents

CONTENTS 5

ABBREVIATIONS AND ACRONYMS 7

GLOSSARY OF TERMS 8

ACKNOWLEDGEMENTS 10

EXECUTIVE SUMMARY 11

BACKGROUND AND INTRODUCTION 13

1.1 LAKE BAIKAL AND ITS CATCHMENT BASIN 13
1.2 SOCIO-ECONOMIC ASPECTS 15
1.3 THREATS TO BIODIVERSITY AND NATURAL RESOURCES 16
1.4 REGIONAL COMMITMENTS TO FUTURE ACTIONS 17

PROCESS OF CONSULTATION FOR THE SAP 19

2.1 RATIONALE OF THE STRATEGIC ACTION PROGRAMME 20
2.2 SCOPE OF THE SAP 20
2.3 THE PROCESS OF CONSULTATION FOR THE SAP 20
2.4 LAKE BAIKAL BASIN TRANSBOUNDARY DIAGNOSTIC ANALYSIS 21

STRATEGIC ACTION PROGRAMME 23

3.1 STRUCTURE OF THE SAP 23
3.2 VISION AND ENVIRONMENTAL QUALITY OBJECTIVES 23
3.2.1 Vision for Lake Baikal Basin 23
3.2.2 Objectives of the Strategic Action Programme 24
3.3 Strategic Components 25
3.3.1 Strategic Component 1: Protection, Restoration and Management of Critical Aquatic and Terrestrial Habitats. 26
3.3.2 Strategic Component 2: Reduction of Pollution and Improvement of Water Quality 28
3.3.3 Strategic Component 3: Sustainable Use of Fisheries, Game, and Other Wildlife Resources 29
3.3.4 Strategic Component 4: Control and Prevention of Biological Invasions 30
3.3.5 Strategic Component 5: Adaptation to Climate Change 30
3.3.6 Strategic Component 6: Preparation for Natural Disasters 31

IMPLEMENTATION AND FUTURE EVOLUTION OF THE SAP 33

4.1 Approaches and Conditions for Effective Implementation 33
4.2 Proposed Cooperative Mechanisms and Institutional Arrangements 34
4.3 Sustainability and Funding 34
4.4 Implementation Steps 35

4.5 MONITORING AND EVALUATION OF SAP IMPLEMENTATION 36

ANNEXES 39

ANNEX I RESULT-BASED INDICATOR FRAMEWORK 39
ANNEX II TDA 66

Abbreviations and Acronyms

Asl	Above sea level
BEZ	Buffer ecological zone of Lake Baikal (term from the Russian Federal Law № 94-FZ “Lake Baikal protection”)
BNT	Baikal natural territory
CBD	Convention on biological diversity
BOD	Biological oxygen demand
CCA	Causal chain analysis
CET	Central ecological zone of Lake Baikal (term from the Russian Federal Law № 94-FZ “Lake Baikal protection”)
CITES	Convention on International Trade in Endangered Species of Fauna and Flora
DO	Dissolved oxygen
EcoQOs	Ecosystem quality objectives
ESIA	Environmental and social impact assessment
FSHEM	Federal Service on Hydrometeorology and Environmental Monitoring (Russian Federation)
GA	Governance analysis
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
GRP	Gross regional product
HPP	Hydroelectric power plant
IHP	International Hydrological Programme of UNESCO
IPCC	Intergovernmental Panel on Climate Change
IWBM	Integrated water basin management
IWRM	Integrated water resource management
MA	Management area
MAB	Man and Biosphere Programme of UNESCO
MNT	Mongolian tögrög (currency)
MPC	Maximum permissible concentration
N	Nitrogen
P	Phosphorus
PA	Protected area
POP	Persistent organic pollutant
PPP	Pulp and Paper Plant
SAG	Scientific advisory group
SAP	Strategic Action Programme
SA	Strategic Action
SFD	Siberian Federal District
SFU	Sheep forage unit
SPA	Strictly protected area
SRB	Selenga River Basin
SRPP	Gusinoozersk State Regional Power Plant
TDA	Transboundary Diagnostic Analysis
TPA	Transboundary Protected Area
TPP	Thermal Power Plant
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNOPS	United Nations Office for Project Services
WWF	World Wide Fund for Nature
WWTP	Wastewater treatment plant

Glossary of Terms

Agenda 21	United Nations Conference on Environment and Development (Earth Summit) agreement on action to be taken to protect the environment. It proposes integrating environmental protection and economic development.
Aimag	First-level administrative subdivision of Mongolia (comparable to provinces). Each aimag is divided into several districts.
Biological invasion	The introduction of an organism into a new environment or geographical region, followed by rapid multiplication and expansion of its range.
Biological Oxygen Demand (BOD)	Amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period. Used as an indication of the organic quality of water.
Bog	Area with a waterlogged, spongy, acidic substrate.
Buffer Environment Zone (BEZ)	The Buffer Environment Zone of Lake Baikal is the physical catchment area of the lake, beyond the central ecological zone, within the territory of the Russian Federation. Also see Central Ecological Zone and Zone of Atmospheric Impact (term from Russian Federal Law N^{o} 94-FZ “Lake Baikal Protection”).
Convention on Biological Diversity	The principal objectives of the Convention on Biological Diversity, which entered into force in 1993, are the conservation and sustainable use of biological diversity, and the fair and equitable sharing of benefits arising from its utilisation. The Convention recognises that the key to maintaining biological diversity depends upon using it in a sustainable manner.
Catchment area	The drainage area of a land surface that contributes flow to a single water body, such as a river, lake or an ocean.
Central Ecological Zone (CET)	The central ecological zone of Lake Baikal includes the lake itself with islands, adjacent water protection zone, as well as the protected areas that are located around the lake. Also see Buffer Environment Zone, and Zone of Atmospheric Impact (term from Russian Federal Law N^{o} 94-FZ “Lake Baikal Protection”).
Convention	A convention is a set of agreed, stipulated or generally accepted international standards, norms, or criteria.
Dublin-Rio Principles	Key principles for IWRM presented at the World Summit in Rio de Janeiro in 1992: 1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. 2. Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels. 3. Women play a central part in the provision, management and safeguarding of water. 4. Water is a public good and has a social and economic value in all its competing uses. 5. Integrated water resources management is based on the equitable and efficient management and sustainable use of water.
Dzud	Mongolian term for an extremely harsh winter, during which livestock is unable to find sufficient food and large numbers of animals die from starvation. Successive dzuds took place in Mongolia between 2000-2002, and 2009-2010.
Eco region	Global Eco region is a concept that was developed by WWF and global experts to rank habitats according to their importance for biodiversity conservation. There are 200 Ecoregions in the world. See: wwf.panda.org/about_our_earth/ecoregions/about
Ecosystem	The dynamic complex of plant, animal and micro-organism communities and their non-living environment, which interact with each other and with their environment as a

	functional unit.
Ecosystem approach	Strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way, while recognizing that humans, with their cultural diversity, are an integral component of ecosystems.
Ecotone	Transitional zone between two or more ecological communities.
Eutrophication	Excessive enrichment of waters with nutrients, typically in the form of nitrates and phosphates, often from human sources such as agriculture, sewage, and urban runoff, which may lead to adverse biological effects, including toxic algal growth and anoxia.
Ger District	Unplanned settlement in the suburbs of a city, where inhabitants predominantly live in traditional Ger (also known as yurt) housings. Inhabitants of Ger districts often do not have access to basic infrastructure including central heating, water and sanitary facilities.
Greenhouse gas	Gas that absorbs and emits radiation within the thermal infrared range in the atmosphere. The primary greenhouse gases in the Earth's atmosphere are water-vapor, carbon dioxide, methane, nitrous oxide, and ozone.
Habitat	The specific place and physical environment within an ecosystem that surrounds (and is influenced by, and utilized by) a particular species of animal, plant, or micro-organism.
Hydrologic flow	The characteristic behaviour and the total quantity of water involved in a drainage basin, determined by measuring such quantities as rainfall, surface and subsurface storage and flow, and evapotranspiration.
Invasive species	Animals, plants or other organisms introduced by man into places out of their natural range of distribution, where they become established and disperse, generating a negative impact on the local ecosystem and species.
IWRM	Integrated Water Resources Management (IWRM) is a process that promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment.
Keystone species	Species with a disproportionately large effect on its environment relative to its abundance. Keystone species play a critical role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem.
Nonpoint source pollution	Nonpoint source pollution refers to pollution from diffuse sources. Nonpoint source water pollution can affect a water body from sources such as runoff from agricultural areas draining into a river, or atmospheric pollution.
Point-source pollution	A point source of pollution refers to a single, identifiable source of air, water or thermal pollution.
Precautionary Principle	If an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking an act. The precautionary principle implies that there is a social responsibility to protect the public and the environment from exposure to harm, when there is a plausible risk.
Rangeland	Vast natural landscapes, including steppes and tundras, which can be used to graze livestock.
Sedimentation	Increased concentration of suspended sediments, and to the increased accumulation (temporary or permanent) of sediments on the bottom of rivers, lakes, and other aquatic systems. The origin of the increased sediment transport into an area may be erosion on land, or activities in the water.
Silage	Fermented, high-moisture content fodder for cattle and sheep.
Steppe	Landscapes that are characterised by grassland plains that are mostly without trees.
Waterlogged	Soil that is saturated by groundwater, sufficient to prevent or hinder agriculture.
Taiga	Landscapes that are characterised by coniferous forests, which consist mostly of pines, spruces and larches.
Tundra	Landscapes that are characterised by extremely cold climates, low biotic diversity, simple vegetation structures, and absence of trees.
Urbanisation	The physical growth of urban areas as a result of rural migration and/or suburban concentration into cities.
Zone of Atmospheric Impact (ZAI)	The Zone of Atmospheric Impact of Lake Baikal is the 200 kms wide area outside the physical catchment area of the lake, to the west and north-west of it within the territory of the Russian Federation, which has economic entities with negative impact on unique ecosystem of the lake.

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Executive Summary

This Strategic Action Programme (SAP) establishes a framework of agreed strategic actions to protect the biodiversity and natural resources of the transboundary Lake Baikal Basin. Threats to the terrestrial and aquatic ecosystems of the Baikal Basin were identified and prioritized collectively by Mongolia and Russia through the process of developing a Transboundary Diagnostic Analysis (TDA[1]). This SAP provides a systematic approach for controlling or preventing these threats through a process involving technical and policy actions to be undertaken cooperatively by the Mongolian and Russian governments.

The SAP defines a programme of priority actions that are based on formal evaluation of challenges as well as opportunities for the conservation of biodiversity and sustainable management of natural resources. The SAP can be considered a response to the need to plan and implement complex integrated natural resource and social development programmes that affect multiple sectors and often have impacts that extend across national boundaries.

The SAP was developed by starting with a vision statement as a guiding concept. Objectives for realizing this vision (Environmental Quality Objectives) were then developed from the results of the TDA. The SAP team (SAG) identified a series of Targets for each EQO. These targets describe desired future conditions for the ecosystem. Targets will be implemented through Strategic Actions, which are specific activities, ranging from policy modifications to scientific studies. Strategic Actions may be conducted at the national or bi-national level, will have a designated budget, timeframe for completion, responsible ministry, and a set of performance indicators.

Implementation of the SAP will be conducted through select, authorized ministries of water and the environment in Mongolia and Russia. The SAP will consist of many separate projects and activities, funded through a wide range of mechanisms and with greatly varied scopes of work and outcomes. SAP implementation will take advantage of international conventions and transboundary agreements which are already in place.

All SAP activities will undergo an ongoing process of monitoring and evaluation to be conducted by the intergovernmental commission. Progress will be measured against baseline conditions using quantitative performance indicators for each activity.

[1] http://baikal.iwlearn.org/en/project/tda

Photo by Elena Chumak

Background and Introduction

1.1 LAKE BAIKAL AND ITS CATCHMENT BASIN

Lake Baikal, situated in south-east Siberia, is one of the world's most unique lakes. It is a global hotspot of aquatic biodiversity, harbouring an extraordinary variety of flora and fauna, including hundreds of endemic species of amphipods, flatworms, and fish, as well as the only species of freshwater seal on earth. At present, over 2,550 species are known from Lake Baikal, including 1,550 species of fauna and 1,000 plant species (Timoshkin 2001) and numbers continue to increase as new species are being discovered (e.g. Kaygorodova 2012; 2013).

Similar to Lake Tanganyika in East Africa, Lake Baikal lies in a geological rift zone that continues to extend as a result of the divergence of continental plates. With an estimated age of between 25-30 million years, and a maximum depth of 1,637 m, Lake Baikal is the world's oldest and the deepest lake. The lake contains approximately 20% of the globally available surface freshwater. Lake Baikal is also famous for its water clarity, which can reach up to 40 m.

In 2008, the Russian Government declared Lake Baikal to be one of the Seven Wonders of Russia. In 1996, Lake Baikal was added to the UNESCO list of World Heritage Sites (UNESCO 1996[2]), due to its value as a natural phenomenon, representing outstanding examples of ongoing ecological and biological processes in evolution and development of freshwater ecosystems, and as a significant habitat for the conservation of biodiversity. Furthermore, the Baikal region includes numerous historical, archaeological and cultural monuments, several of which are traditionally considered sacred.

A total of 336 rivers flow into Lake Baikal with only one outlet, the Angara River. As a result, the residence time of water in the lake is over 300 years. The largest tributary of Lake Baikal is the Selenga River, which starts in Mongolia and contributes in average 50% of annual inflow to the lake. In 1996, the delta of the Selenga River was included on the list of Ramsar Wetlands of International Importance because of its significant role as a habitat for flora and fauna, as well as its role in functioning as a water filter against pollution flowing into the lake.

The water catchment of Lake Baikal is shared by the Russian Federation (Russia) and Mongolia[3]. The Baikal Basin includes Lake Khovsgol, which is Mongolia's largest lake and contains almost 75% of the country's surface freshwater. The basin includes numerous mountains, extensive boreal forests, tundra, and steppes with high scenic beauty and significant natural values. Due to the climatic and geologic differences in the region, a great variety of plants and animal species is found.

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[2] The criteria of the World Heritage Convention on the basis of which Lake Baikal was selected are as follows:
vii. To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.
viii. To be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.
iv. To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.
v. To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation. http://whc.unesco.org/en/criteria

[3] For a definition of the Baikal Basin, see section 1.4.

Given the national, regional, and global significance of the biodiversity in the Baikal Basin, as well as the ecosystem services provided by its aquatic and terrestrial systems, transboundary and international cooperation for the protection and sustainable management of the basin is of vital importance.

The geographical area of this SAP focuses on the physical water catchment basin of Lake Baikal[4], which covers an area of c.a. 540,000 km^2 (Kozhov, 1963) in south-eastern Siberia and northern Mongolia (Figure 1).

Figure 1: Map of Lake Baikal and its transboundary water catchment basin that is shared by Mongolia and the Russian Federation.

The Baikal Basin exists at the junction between biogeographically distinct regions: Central Asian, Eastern Asian, and European-Siberian. These regions consist of combinations of taiga, tundra, steppe and deserts. Consequently, the Baikal Basin harbours extremely diverse communities of plants and animals (Kozhova and Izmesteva, 1998).

[4] The physical water catchment basin of Lake Baikal is denoted elsewhere in this TDA as “Baikal Basin” or “Lake Baikal catchment basin”, following the definition as outlined in this section.

In terms of thematic scope, this SAP covers the Baikal Basin Transboundary Ecosystem[5], which is defined as the dynamic complex of plant, animal, human, and micro-organism communities as well as their non-living aquatic and terrestrial environments, acting as a functional unit within the spatial boundaries determined by the physical water catchment area of Lake Baikal, including Lake Baikal itself and parts of Mongolia as well as parts of the Russian Federation.

1.2 SOCIO-ECONOMIC ASPECTS

Some of the main challenges that Mongolia and Russia each have in common for the sustainable socio-economic development of the populations in the Baikal Basin are the economic and structural isolation of the region, the harsh climate that limits productivity, high transport costs, discrepancy between the demand and supply of electricity, a low degree of economic innovation, and a high dependence on the use of natural resources. Nonetheless, the economies and the livelihoods of the people inhabiting both the Mongolian and Russian parts of the Baikal Basin are steadily improving.

The introduction of the open-market economy in the early 1990's provided a wide variety of opportunities and choices for Mongolia as a nation, resulting in increasing economic growth. Mongolia is presently classified as a lower middle income country[6], but its economy is growing rapidly, which helps to boost disposable incomes and improve consumer confidence. Between 2000-2003 the average annual growth was 4.3%, whereas during 2004-2007 the growth increased to 9.1%. In 2010 the economic growth was slightly slowed down with 6.4%, however growth had reached 17.3% by 2011. In 2011, the GDP reached 10,829.7 billion MNT in current prices, which is an annual growth of 17.5%[7]. Per capita GDP increased to US$2,562 in 2007 to US$ 5,400 in 2012[8].

Traditionally, the main foundation of the economy of Mongolia was pasturing livestock husbandry, and this remains an important part of the country's economy, employment and export revenues. The sector, which includes industrial processing of livestock products and related services, employs 33% of total labour force, and constitutes approximately 19% of the annual GDP and 25% of the country's export revenue.

The past few years the economy of Mongolia has been changing in structure. The mining sector is becoming an increasingly dominant sector and has led the economic growth of the country. The agriculture sector decreased from 18.7% in 2008 to 13.1% in 2011, whereas the industry sector increased from 37% to 58.3% over that same period.

The economy of the Republic of Buryatia has been quite stable over recent years. The gross regional product (GRP) in real terms from 2008 to 2011 years increased by 4 percentage points, in nominal terms-by 20.0% (Burstat 2011[9]). In 2011, the GRP of Buryatia amounted to 152.3 billion rubles (approximately US$ 4.9 billion), with the rate of growth of 104.2% over the previous year.

Although the growth rates are similar to the overall average growth rate in Russia, the GRP per capita in the Republic of Buryatia as well as in Zabaikalsky Krai and the Irkutsk area is lower than elsewhere in the country. Investment in fixed capital per inhabitant also lagged behind the average Russian level, although this difference seems to have become smaller in recent years.

In the Republic of Buryatia, there has been a slight increase in the annual GRP contribution of the industry sector compared to the agriculture sector between 2007-2011. The contribution of the transport sector reduced significantly during that same period. Overall, there has been a steady decline in the proportion of people employed in industry, agriculture and construction since 1985. Agriculture is traditionally an important employment sector in Buryatia, but this sector was impacted heavily by the economic crisis in the 1990's and now only represents 11.9% of the total workforce. The employment rates in trade almost doubled in the same period. The largest increase in employment took place in the public administration sector.

Economic growth in the Republic of Buryatia is mostly generated in Ulan-Ude and the SRB. Although the SRB only occupies 31.5% of the territory of Buryatia, it accounts for about 90% of industrial and 83% of

[5] According to the Convention on Biological Diversity, an ecosystem can be defined as "A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit" (CBD, Article 2) www.cbd.int/convention/articles/?a=cbd-02
[6] http://data.worldbank.org/country/mongolia
[7] www.worldbank.org/en/country/mongolia
[8] https://www.cia.gov/library/publications/the-world-factbook/geos/mg.html
[9] http://burstat.gks.ru

agricultural output. Other areas around Lake Baikal have less opportunities for economic growth. In the Olkhonsky District, the economy is mostly driven by subsidized agriculture, and main sources of revenue generation in the Slyudyansky area take place in the towns of Baikalsk and Slyudyanka. The Irkutsk areas adjacent to Lake Baikal are characterized by overall low standards of living and high levels of hidden unemployment[10].

1.3 THREATS TO BIODIVERSITY AND NATURAL RESOURCES

Threats to biodiversity and natural resources in the Baikal Basin were evaluated through the development of a Transboundary Diagnosic Analysis. The main problem areas and specific problems identified for the Baikal Basin are listed in Box A, in order of prioritisation. The problem areas were prioritised on the basis of their geographical scope and expected severity. The **degradation of aquatic and terrestrial habitats** through deforestation and sedimentation, overgrazing, intensification of landuse, and unsustainable landuse methods in agriculture was identified as one of the key problems for ecosystems in the Baikal Basin.

Hydrological regime changes were also identified as a main transboundary problem. This problem has been manifested as water level decrease resulting from withdrawal of water for domestic, agricultural or industrial purposes, deforestation, and the impacts of climate change. Hydrological regime changes resulting from water level increase caused by dams and hydroelectric power plants was identified as a local problem, especially in Russia, that specifically affects the aquatic and nearshore ecosystems of Lake Baikal.

The **decline of the quality of surface and groundwater resources** resulting from point source and nonpoint source pollution is a significant concern in both Mongolia and Russia. As polluted water can be transported over long distances, it affects downstream areas and is a significant transboundary issue. Once pollutants reach Lake Baikal, they may accumulate for centuries, since water stays in the lake for an estimated 300 years. Five specific problems were identified that affect the quality of water resources in the Baikal Basin:

- **Chemical contamination**: Primarily pollution caused by heavy metals, hydrocarbons, persistent organic pollutants (POPs) and pesticides. Key pollution sources are the mining industry, other industries and domestic waste.
- **Increased suspended solids and sedimentation**: Caused by combined effects of deforestation, unsustainable landuse practises, mining activities, and inadequate treatment of wastewater.
- **Microbial pathogenic contamination**: Resulting from insufficiently treated wastewater, use of bio-control agents such as bacteria, fungi and viruses; inappropriate discharge of medical waste; and inadequate disposal of infected animal carcasses.
- **Organic pollution and eutrophication**: Insufficiently treated wastewater contaminated with faecal matter, detergents and oil hydrocarbons (including fuels and lubricants) forms a point source of organic pollution. Non-point sources include atmospheric deposition, and runoff from areas treated with fertilisers, herbicides and insecticides.
- **Thermal contamination**: Results from use of water as a coolant for power or industrial plants. Thermal contamination is a point-source problem that can have significant impacts on local flora and fauna.

Concerns around the **sustainability of fisheries and wildlife exploitation** in the Baikal Basin are the loss of aquatic and terrestrial biodiversity, as well as loss of potential stocks for human consumption. Overfishing is a major concern in Lake Baikal, particularly on species that are listed as endangered in the Red Books of Mongolia and Russia (e.g. Baikal sturgeon, lenok, taimen). Hunting is to a large extent regulated in the Baikal Basin, and licences are required for the majority of species that are preferred by hunters. However, unregulated hunting and poaching pose problems for wildlife in the basin. The problem is particularly pressing for populations of wildlife whose habitats are declining as a result of deforestation, unsustainable landuse practises, pollution, and the impacts of climate change.

The extent of **biological invasions** in the Baikal Basin thus far seems to be limited to 13 fish species and one plant species in aquatic systems, as well as three plant species in terrestrial systems. However, degraded and polluted habitats are more receptive to biological invasions than pristine habitats, due to a loss of local species diversity and resilience to change. Therefore, due to the levels of habitat degradation and pollution in the Mongolian and Russian territories of the Baikal Basin, the risk of future invasions is high and precautions should be implemented.

[10] The group of unemployed individuals that are not counted in the unemployment figures compiled and released by the government.

Climate change was identified as a cross-cutting theme, which directly or indirectly affects all other problem areas in the transboundary basin. Natural disasters were also identified as a cross-cutting theme. Although **natural disasters** are not caused by human activities, environmental degradation can aggravate their impacts. Conversely, sustainable environmental management can mitigate some of the impacts of natural disasters.

Box A. Main concerns and specific problems identified for the Baikal Basin Transboundary Ecosystem

MAIN PROBLEM AREA	SPECIFIC PROBLEM
1. Degradation of Aquatic and Terrestrial Habitats	• Deforestation • Degradation of agricultural, pasture, and range lands • Ecosystem changes
2. Hydrological Regime Changes	• Water level decrease in the catchment basin • Water level increase in the catchment basin
3. Decline of Water Quality	• Chemical contamination • Increased suspended solids and sedimentation • Microbial pathogenic contamination • Organic pollution and eutrophication • Thermal contamination
4. Unsustainable Fisheries and Wildlife Exploitation	• Over-exploitation of aquatic biota • Over-exploitation of terrestrial wildlife
5. Biological Invasions	• Alien species invading aquatic habitats • Alien species invading terrestrial habitats
CROSS-CUTTING AREAS	
6. Impacts of Global Climate Change	• Fluctuations in freshwater flow • Increased extreme weather events
7. Natural Disasters	• Earthquakes • Mudslides • Droughts and floods

1.4 REGIONAL COMMITMENTS TO FUTURE ACTIONS

In recognition of the value of the natural resources for the people inhabiting the Baikal Basin, the Governments of Mongolia and Russia signed several transboundary agreements. In 1995, the bilateral “Protection and Use of Transboundary Waters” was signed, replacing earlier agreements from 1974 and 1988. Both countries regularly share information, exchange visits, and have a scheme of cooperation in place in case of emergencies.

Various relevant projects and initiatives towards protection of biodiversity and sustainable management of natural resources have taken place in both Mongolia and Russia. This includes a GEF-financed Biodiversity Project that was implemented in Russia from 1996-2003, which resulted in the development of a Lake Baikal Biodiversity Conservation Strategy, providing a political and institutional context for expanding Protected Areas and developing watershed plans.

In spite of the agreements and cooperation between the two countries, and actions at the national level, limited progress has been made towards achieving sustainable transboundary management of the basin. To address the need for improved transboundary planning, cooperation and action, a new project was initiated on Integrated Natural Resource Management in the Baikal Basin Transboundary Ecosystem (UNDP-GEF 2011), which started its 4-year implementation phase in November 2011. The project is supported by UNDP and the Governments of Mongolia and Russia, executed by UNOPS, and financed by the GEF with co-financing from the Foundation for the Protection of Lake Baikal, the Coca-Cola Every Drop Matters program, and UNESCO.

Photo by Elena Chumak

PROCESS OF CONSULTATION FOR THE SAP

The SAP for the Conservation of Aquatic Ecosystems and Sustainable Management of the Natural Resources in the Lake Baikal Basin defines a programme of priority actions that are based on formal evaluation of challenges as well as opportunities for the conservation of biodiversity and sustainable management of natural resources. This process of evaluation involved the TDA carried out by the TDA Science Advisory Group in 2013 with support of the Lake Baikal Project Special Studies.

The SAP uses a basin-wide perspective focusing on the Baikal Basin as a single, transboundary ecosystem entity, identifying barriers preventing better basin-wide collaborative management, and clarifying key emerging threats to aquatic ecosystem health such as invasive species, mining pollution, and increasing nutrient loading. The SAP applies “resilience thinking” in some detail, with detailed recommendations on how to maximize resilience across the Baikal Basin ecosystem – both from a natural ecosystem and human social system perspective.

The process of preparing the SAP started in 2014 through national and regional consultations of stakeholders from the riparian countries, analysis and integration of the outcomes of relevant scientific studies published after the TDA.

To coordinate and implement the SAP development process, a Scientific Advisory Group (SAG) was established, comprising expert teams from Mongolia and Russia (Annex III). To ensure continuity, the SAG included several of the experts who also participated in the updating of the TDA. The Scientific Advisory Group consisted of representatives from intergovernmental organizations working on behalf of the countries in the region, as well as a number of regional experts in natural scientists, social, legal, political and economic.

The SAG was supervised by the Project Manager and an international consultant with expertise on the GEF TDA-SAP process.

A two-day regional workshop[11] was organized in March 2014 (Ulaanbaatar, Mongolia) during which the long-term vision and Environmental Quality Objectives (EQOs) were defined. A second two-day regional workshop[12] was organized in April 2014 (Ulan-Ude, Russia) during which the actions and result-based indicators were discussed and developed.

During the period May 2014 – July 2014 the members of the SAG collected and analyzed additional data and information relevant to a range of topics, including approaches and conditions for effective SAP implementation, proposed cooperative actions to implement the SAP, proposed cooperative mechanisms and institutional arrangements, sustainability and funding, relevant national action plans and policy documents and SAP implementation steps. The draft SAP was presented at the Third Baikal Project Steering Committee Meeting in July 2014.

As such, the SAP is intended to be a flexible planning framework to be revised in response to changes in opportunities from, and threats to biodiversity and natural resources of the Lake Baikal Basin, and to changing needs and aspirations of overall regional development.

[11] For a report of the meeting, see:.
[12] For a report of the meeting, see:.

2.1 RATIONALE OF THE STRATEGIC ACTION PROGRAMME

The SAP (Box B) is a response to the need to plan and implement complex integrated natural resource and social development programmes that affect multiple sectors and often have impacts that extend across national boundaries.

Box B: Definition of the SAP

"The SAP should establish clear priorities that are endorsed at the highest levels of government and widely disseminated. Priority transboundary concerns should be identified, as well as sectoral interventions (policy changes, programme development, regulatory reform, capacity-building investments, and so on) needed to resolve the transboundary problems as well as regional and national institutional mechanisms for implementing elements of the SAP" (GEF Operational Strategy, 1996).

Fundamental to this is the recognition that because management plans have to be revised in response to changing circumstances, there can be no final plan. The SAP therefore establishes an agreed planning and management process and prioritises an initial programme of interventions based on present needs and knowledge.

The SAP provides a regional framework for actions to achieve the objective of the conservation of the Lake Baikal Basin's transboundary aquatic ecosystems: to spearhead integrated natural resource management of Baikal Lake Basin and Khovsgol Lake ensuring ecosystem resilience reduced water quality threats in the context of sustainable economic development.

2.2 SCOPE OF THE SAP

The SAP addresses a shared regional concern, defines the framework for a programme of actions and includes immediate regional actions to address constraints to conserve biodiversity and achieving sustainable use of natural resources. As the problems and opportunities the SAP addresses all relate to activities carried out within the national waters or national territories of both countries of the transboundary basin, the actual implementation of these actions is a national responsibility.

The SAP uses a basin-wide perspective focusing on the Baikal Basin as one whole, transboundary ecosystem entity, identifying barriers preventing better basin-wide collaborative management, and clarifying key emerging threats to aquatic ecosystem health. The SAP constitutes a binding agreement between the two countries. It identifies goals for ecosystem protection and includes milestones and indicators for attainment of the goals. In order to achieve the jointly-agreed goals, both countries are expected to develop biodiversity conservation standards for tourism, agriculture, mining, and fisheries and to implement sub-basin watershed management plans that incorporate water quality and biodiversity objectives.

While the majority of actions are defined to the national level, they provide regional and global benefits, over and above the national benefits of promoting sustainable development. They therefore include the incremental costs of conserving the regional and global benefits of biodiversity and are also a priority for multilateral, bilateral and other forms of support.

2.3 THE PROCESS OF CONSULTATION FOR THE SAP

The SAP is based on a concept of strategic joint fact finding as a means of arriving at a consensus on the actions that are needed to address threats, in line with the methodology that is recommended by the GEF. Following this methodology, collaborating countries established teams that worked together to establish a common baseline of facts and analysis of the problem in the form of a TDA, which was then used to set priorities for national actions to address threats to international waters in the form of the SAP.

The process of formulating and updating the SAP followed an analytical approach to identify immediate management objectives within the overall goal of conserving biodiversity and promoting sustainable use of natural resources. This approach included a multi-tiered framework that facilitated prioritization of the most urgent interventions to enable the development of detailed proposals and/or measures to address identified priorities.

After analysis of the main threats and specific problems involved, priorities were established for possible interventions and a sequence of management interventions were proposed to counteract each identified

problem. Each specific problem was defined in terms of site and impact, time frames were assigned and relevant stakeholders and key agencies for implementation were identified. Furthermore, uncertainties where further research and/or monitoring would be required to define the need for action or to develop solutions were listed.

Throughout the region, government and private resources are stretched by existing demands. The resources that can be directed towards biodiversity conservation and sustainable development will always be limited by conflicting demands for national poverty alleviation, employment creation and food security. As a result, it is necessary to establish priorities to direct limited resources (financial, material and/or human), in order to address the most critical problems and thus make the best use of available resources.

The prioritization used in the SAP is based on the national and regional examination of the problems and opportunities presented by biodiversity conservation and sustainable management of natural resources within a regional framework. This prioritization guides national interventions, within the context of the accepted regional programme.

2.4 LAKE BAIKAL BASIN TRANSBOUNDARY DIAGNOSTIC ANALYSIS

Interventions proposed by this SAP have been based on the objective, technical information assembled in the Lake Baikal Basin TDA. The purpose of the TDA is to define immediate management objectives within the overall aim of addressing global concerns, conserving biological diversity and ensuring the sustainable use of natural resources for local communities and other users into the foreseeable future. The TDA approach is based on the concept of strategic joint-fact finding as a means of arriving at a consensus on what actions are needed to address threats.

In accordance with GEF best practices for international waters projects, a preliminary TDA was undertaken between 2008 and 2009. The TDA was updated during the period August 2012 to March 2013. To coordinate and implement the updating process, a Scientific Advisory Group (SAG) was established, comprising expert teams from Mongolia and Russia. To ensure continuity, the SAG included several of the experts who also participated in the drafting of the preliminary TDA. To update the TDA, the members of the SAG collected and analyzed data and information relevant to a range of topics, including pollution hotspots, biological invasions, and climate change. With support from UNESCO, additional data was collected and analyzed relevant to the sustainable use of groundwater resources in the Baikal Basin. The new data is either integrated in this document, or presented as Technical Annexes. Additional technical reports will be annexed to this document as they become available during further updating processes.

Besides identifying problem areas and causes, the TDA identified the socio-economic, legal, administrative, and political contexts or constraints relevant for the integrated management of the transboundary water basin. Up-to-date, efficient, and effective governance structures are necessary at the local, national, and bilateral levels in order to translate the technical recommendations of the TDA into the strategic actions proposed in this SAP. Toward that end, the principles and opportunities for good governance in sustainable natural resource management are presented in the TDA, as well as an overview of the present and potential role of civil society.

In addition to legal and institutional frameworks, it is necessary to recognize other governance considerations. Civil society movements are steadily emerging in the region, and increasingly able to influence general public opinion as well as governance, in spite of obstacles or state-imposed constraints. The TDA also discusses the important role of environmental education activities and public awareness campaigns in empowering people about issues relevant to the protection of biodiversity, management of natural resources and sustainable development opportunities.

For more detailed information, please refer to the TDA (Annex II) as well as the Strategic Components sections below.

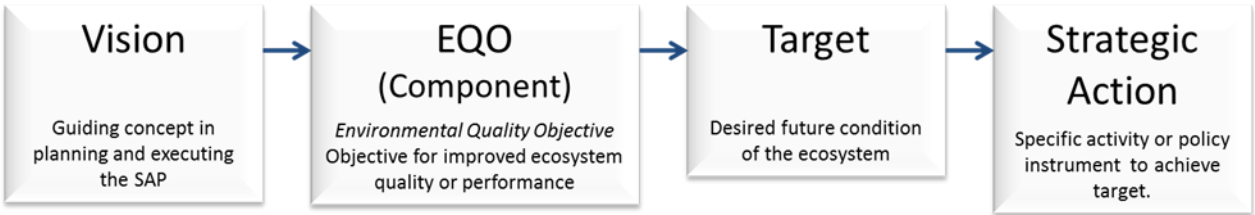
Photo by Elena Chumak

STRATEGIC ACTION PROGRAMME

3.1 STRUCTURE OF THE SAP

The SAP for the Conservation of Aquatic Ecosystems and Sustainable Management of the Natural Resources in the Lake Baikal Basin is a blueprint for the systematic implementation of a vision for the desired future of the Baikal Basin. Box C shows an overview of how this vision will be implemented. Realization of the vision (Section 3.2.1) for the Baikal Basin will be conducted through six Environmental Quality Objectives (EQOs). Each EQO addresses an environmental problem identified in the TDA. Targets articulate the desired state of the ecosystem by the end of the stated timeframe. Targets will be implemented through Strategic Actions (Section 3.3), which are specific activities, ranging from policy modifications to scientific studies. Strategic Actions may be conducted at the national or bi-national level, will have a designated budget, timeframe for completion, responsible ministry, and a set of performance indicators.

Box C: Flowchart of the SAP Process



3.2 VISION AND ENVIRONMENTAL QUALITY OBJECTIVES

3.2.1 Vision for Lake Baikal Basin

The vision of the SAP for the conservation of aquatic ecosystems and sustainable management of the natural resources in the Lake Baikal Basin is as follows:

To enhance protection of the unique Lake Baikal Basin ecosystem, in the context of sustainable economic development and global climate change.

The vision is based on key principles (Box D) that are embodied in existing Conventions to which the four countries are Parties or which they have adopted, in particular the environmental and social principles that underlie the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, UNESCO Convention on the World Cultural and Natural Heritage and Convention on Wetlands of International Importance (Ramsar Convention).

Box D: Key principles underlying the SAP.

Principle of Wise use: the maintenance of their "ecological character"[13], achieved through the implementation of ecosystem approaches, within the context of sustainable development.
Precautionary Principle: Preventive measures shall be taken when there are reasonable grounds for concern that an actual or planned activity within the territory or under the jurisdiction and control of a Contracting Party may bring about an adverse impact, even if there is no conclusive scientific evidence of a causal relationship between the activity and the adverse impact.
Principle of Preventive Action: Action shall be taken to prevent adverse impacts arising by taking timely action to address the actual or potential causes of the adverse impacts.
Principle of Participation: Concerned and affected natural and legal persons and lake basin communities must be given the opportunity to participate, at the appropriate level, in decision making and management processes that affect the lake and its basin; appropriate access to information concerning the environment that is held by public authorities; and effective access to judicial and administrative proceedings to enable them to exercise their rights effectively.
Principle of Fair and Equitable Benefit Sharing: Local communities are entitled to share in the benefits derived from local natural resources.
Principle of Gender Equity: Importance of recognizing the roles of both men and women in environmental management. As regards men, their role is usually well recognized in institutional arrangements for the development and management of environmental resources. However, the key role of women as users and guardians of specific natural resources is often overlooked. Acceptance and implementation of the support of women's central role in environmental management requires positive policies to address practical and strategic gender needs. Women in particular should be empowered and equipped to participate at all levels in the development of sustainable management strategies and environmental conservation programmes. This must include women's involvement in decision-making as well as implementation in ways determined by local communities themselves.
Polluter Pays Principle: The costs of pollution prevention, control and reduction measures are to be borne by the polluter.

3.2.2 Objectives of the Strategic Action Programme

An early activity in the development of the SAP, was to translate the main concerns and specific problems identified in the TDA into Environmental Quality Objectives that can be addressed in SAP implementation. Six objectives were identified which relate directly to the seven problem areas shown in Box A. These are summarized in Box E.

Box E: Bridging the TDA and the SAP.

TDA Problem Area	Environmental Quality Objectives
Degradation of Aquatic and Terrestrial Habitats Hydrological Regime Changes Decline of Water Quality	Protect, restore, and manage critical habitats Reduce pollution
Unsustainable Fisheries and Wildlife Exploitation	Manage fish and wildlife
Biological Invasions	Control / prevent invasive species
Global Climate Change	Climate change adaptation
Natural Disasters	Natural disaster preparation

The SAP has six overall objectives relating to the desired environmental quality. These Environmental Quality Objectives (EQOs) describe the state or quality of the environment that the riparian countries hope to achieve by 2025 through the implementation of the SAP. The EQOs are intended to ensure that biodiversity is protected and natural resources in the basin are sustainably managed, and they should form the basis for sustainable socio-economic development in the region.

Implementation of EQOs can be accomplished using principles of transboundary integrated water resource management (IWRM). Transboundary IWRM is a systematic process for the sustainable development, allocation, and monitoring of water resource use in the context of social, economic and environmental objectives.

[13] Convention on the Wetlands of International Importance (Ramsar, Iran, 1971)

The EQOs for the Lake Baikal Basin are in summary: protection, restoration and management of critical aquatic and terrestrial habitats (Component 1), Reduction of Pollution and Improvement of Water Quality (Component 2), Sustainable Use of Fisheries, Game and Other Wildlife Resources (Component 3), Control and Prevention of Biological Invasions (Component 4), Adaptation to Climate Change (Component 5) and Preparation for Natural Disasters (Component 6). Table 1 provides the full statements of the EQOs, as well as the targets defined for accomplishing these objectives. Section 3.3 describes the strategic actions which will be conducted to implement this SAP.

Table 1. Environmental Quality Objectives and Main Targets of the SAP

Component and Environmental Quality Objective	Targets
Component 1: *Critical aquatic and terrestrial habitats are protected, restored and managed for the conservation of biodiversity and sustainable use for the people living in the Baikal Basin.*	1. Strengthening institutional mechanisms for integrated natural resource management. 2. Awareness of the importance of aquatic and terrestrial habitats protection. 3. Improved Protected Area management and expansion of the Protected Area network. 4. Enhance the role of rational technologies and natural resource management. 5. Sustainable Management and ecologically friendly development in agricultural and urban areas. 6. Decline of deforestation and desertification levels. 7. Sustainable management of water resources, including enhanced public water supply. 8. Sustainable management of natural resources.
Component 2: *Environmental Pollution is reduced and water quality is improved to meet standards agreed between Mongolia and Russia.*	9. Reduction of point source environmental pollution from stationary and mobile pollution sources. 10. Reduction of pollution levels from agriculture and non-point sources. 11. Reduction of pollution from mining. 12. Reduction of pollution from tourism and recreational activities.
Component 3: *Fish stocks and wildlife areas are healthy and adequately managed to sustain future exploitation.*	13. Enhancement of control, protection and system management of fisheries, hunting and other wildlife resources.
Component 4: *Biological invasions are controlled and future invasions are prevented.*	14. Existing biological invasions are under control and decreasing; future biological invasions are prevented.
Component 5: *Aquatic and terrestrial ecosystems and human societies are sufficiently resilient to adapt to the impacts of climate change.*	15. Increased capabilities to monitor and adapt to climate change.
Component 6: *Human societies in the Lake Baikal Basin are better prepared for natural disasters.*	16. Enhancement of forecasting, warning and responding to natural disasters.

3.3 Strategic Components

The strategic actions (SA) listed in the following sections and tables are activities that can take place in a wide range of settings and timeframes. Strategic actions can be as specific as highly focused scientific studies to broad changes in policy or legal and institutional frameworks. Although they vary in content, each of them is part of a coordinated set of strategies for accomplishing the targets that have been defined for meeting environmental quality objectives. The implementation and evaluation of strategic actions are defined and monitored through a Result-based Indicator Framework (Annex I). This framework provides quantitative criteria which are measured against baseline values defined at the onset of the project. The result-based indicator framework will also form the basis for the monitoring and evaluation programme (Section 4.5) to be conducted in SAP implementation.

In this SAP, strategic actions are considered to be either “Strategic” or “Supplementary”. Actions which are strategic address directly and with high priority the future state of the ecosystem intended in the target. Actions which are supplementary also contribute to the realization of the target, but have a lower priority. Strategic actions also vary widely in scale and may be accomplished as a project at the local scale, or may require coordination at the bi-national scale. This will be discussed further in Section 4, SAP Implementation.

3.3.1 Strategic Component 1: Protection, Restoration and Management of Critical Aquatic and Terrestrial Habitats.

(*EQO - Critical aquatic and terrestrial habitats are protected, restored and managed for the conservation of biodiversity and sustainable use for the people living in the Baikal Basin.)*

This is the broadest and most comprehensive of the strategic components and includes 8 targets implemented through 39 strategic actions (Table 2). Protection of aquatic and terrestrial habitats is proposed through legal and regulatory strategies (e.g., SAs 4.3, 5.1 and 6.1) as well as through implementation of improved technologies and practices (e.g., Target 4). Ecosystem restoration is addressed in SAs 6.10.

Many of the activities conducted to support the SAP will require regional coordination. Examples are the harmonized monitoring programs and the development of shared databases described in SAs 1.2, 1.3, and 6.2. These and many of the other activities in SAP implementation will require strengthened institutional mechanisms for integrated natural resources management. These mechanisms are defined in Target 1 and build on existing cooperative structures.

Awareness of the importance of protecting ecosystems is addressed in Target 2. Improved public education of the importance of ecosystems will increase public acceptance of these programs and likely will assist in building support for public funding which can help assure sustained implementation of the SAP. A complete listing of strategic actions for Component 1 is provided in Table 2.

Table 2. Strategic Actions to protect restore and manage of critical aquatic and terrestrial habitats.

Target (Priority)	Strategic Action (Strategic or Supplementary)
Target 1. Strengthening institutional mechanisms for integrated natural resource management. **Priority** – High	**Strategic Action 1.1.** Improvement of legal and institutional framework in the field of environmental protection and sustainable nature management in the transboundary basin of the Lake Baikal. (Strategic) **Strategic Action 1.2.** Creation of a Russian-Mongolian mechanism of coordination and implementation of this SAP. (Strategic) **Strategic Action 1.3.** Development of mechanisms for gathering and analysis of harmonized information about the state of natural resources in the Lake Basin Baikal. (Strategic) **Strategic Action 1.4.** Creation of a harmonised system of transboundary monitoring for terrestrial ecosystems of the Lake Baikal Basin. (Strategic) **Strategic Action 1.5.** Strengthening of role of the Russian-Mongolian Joint Information Centre. (Supplementary)
Target 2. Awareness of the importance of aquatic and terrestrial habitats protection. **Priority -** Very High.	**Strategic Action 2.1.** Preparation of information about uniqueness of regional and landscape biological diversity of aquatic and terrestrial habitats in the Lake Baikal basin. (Strategic) **Strategic Action 2.2.** Creation of universally accessible and regularly updated information systems and databases based on primary information about environmental pollution and man-made impact on ecosystems of the Lake Baikal basin. (Supplementary) **Strategic Action 2.3** Elaborate and comply with rules "On civil behaviour in clean environment". (Supplementary) **Strategic Action 2.4.** Creation of possibilities for the public and population to obtain full information regarding condition of the environment and man-made impact of all sources of waste water discharge, emissions and solid waste. (Strategic) **Strategic Action 2.5.** Publication in scientific journals and mass media of new scientific studies on the impacts of natural and man-made impacts on aquatic and terrestrial habitats in the Lake Baikal basin. (Supplementary) **Strategic Action 2.6.** Announcements in mass media about administrative and economic actions as well as penal sanctions in cases of grave violation of

	environmental protection laws of the Lake Baikal basin. (Supplementary) **Strategic Action 2.7.** Organization of scientific conferences and festivals dedicated to protection and rational use of natural resources, as well as to friendship of nations living on the territory of the Lake Baikal basin. (Supplementary) **Strategic Action 2.8.** Organize scientific conferences and festivals dedicated for effective use of water and other natural resources and friendship of nations. (Supplementary)
Target 3. Improved Protected Area management and expansion of the Protected Area network. **Priority** – High.	**Strategic Action 3.1.** Harmonization of the Russian and Mongolian national legislatures regarding regulation of protected areas. (Strategic) **Strategic Action 3.2.** Expansion of the chain of national protected areas and creation of transboundary protected areas in the Lake Baikal Basin. (Strategic) **Strategic Action 3.3.** Enhancement of the legal responsibility for violations of environmental standards in a protected area and enforcement of existing environmental standards. (Strategic)
Target 4. Enhance the role of rational technologies and natural resource management. **Priority** - Very High.	**Strategic Action 4.1.** encourage available ecologically safe practices. (Strategic) **Strategic Action 4.2.** Use best available technologies for public and industrial water supply and waste water disposal including maximum use of recirculating water supply. (Strategic) **Strategic Action 4.3.** Provide economic incentive for land users who utilize non-waste, energy-saving and other technologies with minimal environmental impact. (Strategic) **Strategic Action 4.4.** Introduction of international standards on environmental management at enterprises and in organizations. (Supplementary)
Target 5. Sustainable Management and ecologically friendly development in agricultural and urban areas. **Priority** – High.	**Strategic Action 5.1.** Establish environmental zoning in order to attain optimal placement of industrial and other objects minimizing their damage to the environment. (Supplementary) **Strategic Action 5.2.** Include rural and urban sustainable development objectives into strategies of national and regional development. (Supplementary) **Strategic Action 5.3.** Delineation of water body buffer zone borders in settlements and realization of legislative requirements. (Supplementary)
Target 6. Decline of deforestation and desertification levels. **Priority** - Very High.	**Strategic Action 6.1.** Enhance the existing nature protection legislation (Forestry Code, Land Code, etc.) in the Russian Federation and Mongolia to harmonize nature protection provisions and provision of incentives for eco-technologies. (Strategic) **Strategic Action 6.2.** Develop and implement a forest monitoring (including remote sensing) system including: • monitoring of forest resources (forest pathology monitoring); • forest fire monitoring; • monitoring of forest conditions in technogenic pollution zones; • phytodiversity monitoring. • (Strategic) **Strategic Action 6.1.** Pass statutory acts for undertaking operative action and planning on prevention of deforestation, degradation and desertification. (Strategic) **Strategic Action 6.4.** Initiate forest protection to preserve healthy and intact forest and implement initiatives for forest pathology control, inventory and prediction of pests and forest disease, as well as needed prophylaxis for combating them. (Strategic) **Strategic Action 6.5.** Increase forest production through reforestation to support household and industrial needs. (Strategic) **Strategic Action 6.6.** Define zones vulnerable to desertification and conduct restoration activities. (Supplementary) **Strategic Action 6.7.** Develop and implement regional development plans taking into account desertification and deforestation control. (Strategic) **Strategic Action 6.8.** Regulate the number of cattle and pasture load depending on pasture carrying capacity. (Supplementary) **Strategic Action 6.9.** Restoration of soil quality. (Strategic)
Target 7. Sustainable management of water	**Strategic Action 7.1.** Enhance the transboundary hydrological monitoring system of surface waters and groundwaters including the implementation of

resources, including enhanced public water supply. **Priority** – High.	automated systems. (Supplementary) **Strategic Action 7.2.** Apply principles of integrated water resource management in the development of new or enhanced community water supplies in the Lake Baikal basin. (Strategic) **Strategic Action 7.3.** Reduction in use of technologies which have priority pollutants and highly hazardous substances for water supply and waste water disposal for all facilities and households in the Lake Baikal Basin. (Strategic)
Target 8. Sustainable management of natural resources. **Priority** – High.	**Strategic Action 8.1.** Estimate the ecological capacity of territories for anthropogenic impact, determine admissible anthropogenic impacts on these ecosystems, and manage ecosystems based on the impermissibility of exceeding ecological capacity. (Strategic) **Strategic Action 8.2.** Use of "green growth" indicators in the Lake Baikal Basin: (indicators for the monitoring of environmental assets, developed by OECD). (Strategic) **Strategic Action 8.3.** Introduce mandatory environmental expertise of projects in the Lake Baikal Basin related to development, agriculture, fish hatcheries, and fish processing. (Strategic) **Strategic Action 8.4.** Introduce a mechanism of ecological risk insurance for large projects in Lake Baikal Basin. (Strategic)

3.3.2 Strategic Component 2: Reduction of Pollution and Improvement of Water Quality

(*EQO - Environmental Pollution is reduced and water quality is improved to meet standards agreed between Mongolia and Russia.)*

While Component 1 addresses ecosystem health and quality, Component 2 directly addresses pollution sources and defines water quality objectives for the following sectors: urban and transportation-related sources, agriculture, mining, and tourism (Targets 9 through 12, respectively). These objectives will be achieved through a variety of strategies, although legal and institutional changes (e.g, SAs 9.2, 9.3 and 11.8) and the implementation of best-available technologies (e.g., SAs 9.1 and 10.1) are the most important elements of this component. Improvements to infrastructure and facilities are included in SAs 9.4 and 9.9 and monitoring programs are included in SA 12.1. A complete listing of strategic actions for Component 2 is provided in Table 3.

Table 3. Strategic action for reduction of pollution and improvement of water quality.

Target (Priority)	Strategic Action (Strategic or Supplementary)
Target 9. Reduction of point source environmental pollution from stationary and mobile pollution sources. **Priority** - Very High.	**Strategic Action 9.1.** Increase responsibility of ship owners for violation of environmental legislation including discharge of wastes into the waters of the Baikal Basin. (Strategic) **Strategic Action 9.2.** Creation of waste collecting networks and sanitary checkpoints on urbanized rural territories, along the railroads and highways. (Strategic) **Strategic Action 9.3.** Develop the paved network roads. (Supplementary) **Strategic Action 9.4.** Reduction of hazardous substance discharge volume in boundaries of water protection zones and territories around large residential areas, industrial and infrastructural objects. (Supplementary) **Strategic Action 9.5.** Repair urban and rural storm water, sanitary sewer, and solid waste systems. (Strategic) **Strategic Action 9.6.** Increase governmental support for the use of local wastewater treatment plants. (Strategic) **Strategic Action 9.7.** Encourage transition to alternative fuels. (Strategic) **Strategic Action 9.8.** Construct facilities and special sanitation ships for collecting domestic waste and waste water in the Lake Baikal and Lake Khovsgol Basins. (Supplementary)
Target 10. Reduction of pollution levels from agriculture and non-point sources. **Priority** – High.	**Strategic Action 10.1.** Develop and disseminate the best practice recommendations to use environmentally friendly agrochemicals, including time and speed of their use, their handling, storage and ultimate disposal. (Supplementary) **Strategic Action 10.2** Increase control over the use of fertilizer, pesticide, herbicides and other chemicals, and prevent their use where appropriate. (Strategic)

	Strategic Action 10.3 Conduct research on the impact of chemical fertilizers on soils. (Supplementary) **Strategic Action 10.4** Strategy development for (dead) livestock disposal in the Lake Baikal Basin. (Supplementary)
Target 11. Reduction of pollution from mining. **Priority** - Very High.	**Strategic Action 11.1** Monitor and control soil, surface water and ground water pollution, and elaborate measurement and technology solutions for effective use of mineral resources. (Strategic) **Strategic Action 11.2.** Improve monitoring and control of mercury use and cyanide contamination in gold mining factories. (Strategic) **Strategic Action 11.3.** Use environmentally friendly technologies in construction of access ways and other infrastructure to mining facilities. (Strategic) **Strategic Action 11.4.** Implement water reuse in mining enterprises. (Strategic) **Strategic Action 11.5.** Apply resource-saving and non-waste technologies in the mining industry. (Strategic) **Strategic Action 11.6.** Include land reclamation into mining projects and enhance the legal responsibility for violations related to the failure of remediation after project completion. (Supplementary) **Strategic Action 11.7.** Provide post-accident clean-up in the mining industry, including rehabilitation of ecosystems and wildlife. (Supplementary) **Strategic Action 11.8.** Increase the responsibility for illegal artisanal mining. (Strategic) **Strategic Action 11.9.** Implement pilot projects that use environmental friendly mining technologies. (Supplementary)
Target 12. Reduction of pollution from tourism and recreational activities. **Priority** - Very High.	**Strategic Action 12.1.** Enhance monitoring to assess the impact of tourism and recreation on the environment. (Supplementary) **Strategic Action 12.2.** Formulation of proposals to the regional programs of socio-economic development, dealing with reduction of pollution level coming from tourist and recreational activity, and creation of sanitation control stations in tourist zones. (Supplementary) **Strategic Action 12.3.** Convert to sustainable tourism and recreation. (Strategic) **Strategic Action 12.4.** Expand the “Great Baikal Trail” project and the international route Khovsgol-Baikal project implementation; hand over completed facilities to municipal or commercial organizations for use. (Supplementary) **Strategic Action 12.5.** Strengthen the role of landscape planning in tourism. (Strategic) **Strategic Action 12.6.** Establish and implement for purposes of management of recreational objects maximum admissible environmental pressure levels for recreational areas. (Strategic)

3.3.3 Strategic Component 3: Sustainable Use of Fisheries, Game, and Other Wildlife Resources

(*EQO - Fish stocks and wildlife areas are healthy and adequately managed to sustain future exploitation*.)

Conservation and management of game and fisheries are considered in five strategic actions within Target 13 of the SAP. These strategic actions allow for monitoring the extent of the terrestrial and commercial aquatic resources (SAs 13.1 and 13.2), make regulatory reforms (SA 13.3), and provide legal support for the needs of indigenous populations (SA 13.4). A complete listing of the strategic actions for Component 3 is provided in Table 4.

Table 4. Strategic action for sustainable use of fisheries, game, and other wildlife resources.

Target (Priority)	Strategic Action (Strategic or Supplementary)
Target 13. Enhancement of control, protection and system management	**Strategic Action 13.1** Identify and monitor bio-resources and wildlife. (Strategic) **Strategic Action 13.2.** Assessment of condition and forecast industrial use of fish resources and inventory of natural spawning ground condition.

of fisheries, hunting and other wildlife resources. **Priority** - Very High.	(Supplementary) **Strategic Action 13.3.** Improvement of effectiveness of fish farming plants' work. (Supplementary) **Strategic Action 13.4.** Enhance legal mechanisms of nature resource use in the Lake Baikal basin and improve efficiency of regulatory agencies and law enforcement in order to suppress poaching. (Strategic) **Strategic Action 13.5.** Provide legal support for traditional nature management of indigenous peoples with official legal status. (Strategic)

3.3.4 Strategic Component 4: Control and Prevention of Biological Invasions

(*EQO - Biological invasions are controlled and future invasions are prevented.*)

Invasive biological species can cause great damage to both the aquatic and terrestrial ecosystems in the Baikal Basin. Target 14 is directed at controlling existing invasive species and preventing the introduction of new invasions. Strategic actions to accomplish these targets combine scientific investigations and monitoring programs (SAs 14.1, 14.2 and 14.3) to understand the nature and extent of biological invasions. Innovative management strategies to control invasive species are considered in SA 14.4. Legislative and regulatory enhancements are included in SA 14.7. Economic incentives and alternative technologies for business enterprises are considered in SA 14.5. A complete listing of the strategic actions for Component 4 is provided in Table 5.

Table 5. Strategic action to control and prevention of biological invasions.

Target (Priority)	Strategic Action (Strategic or Supplementary)
Target 14. Existing biological invasions are under control and decreasing; future biological invasions are prevented. **Priority** - Very High.	**Strategic Action 14.1.** Identification and organization of scientific research of causes, sources and living environment of all existing invasive species. (Strategic) **Strategic Action 14.2. Conduct m**onitoring to track the extent of existing invasive species and detect new invasive species both in aquatic and terrestrial habitats. (Strategic) **Strategic Action 14.3.** Systematize information about the existing invasive species including their influence on local biodiversity and functioning of ecosystems in general. (Supplementary) **Strategic Action 14.4.** Develop strategies to reduce the existing invasions and/or localize their habitat areas, including application of international experience. (Strategic) **Strategic Action 14.5.** Support development of technologies which replace those that have the effect of stimulating the growth and reproduction of invasive species. (Supplementary) **Strategic Action 14.6.** Raise awareness of key stakeholders about potential after-effects of biological invasions. (Supplementary) **Strategic Action 14.7.** Enhance legislation to prevent and control invasions. (Supplementary) **Strategic Action 14.8.** Investigate mechanisms by which new invasive species may penetrate into the Baikal Basin. (Supplementary)

3.3.5 Strategic Component 5: Adaptation to Climate Change

(*Aquatic and terrestrial ecosystems and human societies are sufficiently resilient to adapt to the impacts of climate change.*)

Adaptation to climate change is addressed in Target 15. This target includes strategic actions to increase the resilience of ecosystems to environmental change and improve the understanding of the impacts of climate change on ecosystems in the Baikal Basin. Strategic actions include scientific investigations (e.g., SA 15.1), management strategies (SA 15.2), economic considerations (SA 15.4), and the support of climate change mitigation through investments in environmentally friendly alternatives (SA 15.5). A complete listing of strategic actions for Component 5 is provided in Table 6.

Table 6. Strategic action for adaptation to climate change.

Target (Priority)	Strategic Action (Strategic or Supplementary)
Target 15. Increased	**Strategic Action 15.1.** Assess ecosystem vulnerability and flexibility to climate

capabilities to monitor and adapt to climate change. **Priority** – High.	change impacts in the lake Baikal Basin. (Strategic) **Strategic Action 15.2.** Develop and implement strategies to increase ecosystem resilience and adaptation to climate change. (Supplementary) **Strategic Action 15.3.** Conduct breeding to enhance certain qualities of plants and animals which assist their adaptation to climate change. (Supplementary) **Strategic Action 15.4.** Conduct economic assessment of climate change impact on economic activities involving the use of biological resources. (Supplementary) **Strategic Action 15.5.** Support climate change mitigation through increased investments in environmentally friendly alternatives. (Strategic)

3.3.6 Strategic Component 6: Preparation for Natural Disasters

(*EQO - Human societies in the Lake Baikal Basin are better prepared for natural disasters.)*

Preparation for natural disasters will require enhanced modelling and forecasting infrastructure (SA 16.1), early-warning systems (SA 16.4), and the coordinated activities of institutional entities (SA 16.5).Table 7 provides a complete listing of strategic actions for Component 7.

Table 7. Strategic action for preparation for natural disasters.

Target (Priority)	Strategic Action (Strategic or Supplementary)
Target 16. Enhancement of forecasting, warning and responding to natural disasters (e.g., fires, floods, droughts, hurricanes, mudslides, earthquakes, dzud) and epizootics. **Priority** – High.	**Strategic Action 16.1.** Enhance methods of forecasting and modelling; and develop a system of training for specialists in seasonal weather forecasting and prediction of river run-off. (Supplementary) **Strategic Action 16.2.** Develop and implement risk reduction systems for natural disasters at the national and transboundary levels to prevent or reduce impacts of natural disasters. (Supplementary) **Strategic Action 16.3.** Implement joint assessments and management of ecosystem services; and organize streaming information for forecasting, warning and responding to natural disaster challenges. (Supplementary) **Strategic Action 16.4.** Enhance the disaster response system when natural disasters occur. (Strategic) **Strategic Action 16.5.** Develop improved transboundary preventive and warning system for the protection of wildfires and flooding. (Supplementary) **Strategic Action 16.6.** Enhance resilience to climatic disasters through adoption of groundwater emergency plans for more vulnerable and densely populated areas. (Strategic) **Strategic Action 16.7.** Work toward eradication of epidemic and epizootic outbreaks. (Supplementary)

Photo by Mikhail Chumak

IMPLEMENTATION AND FUTURE EVOLUTION OF THE SAP

Implementation of the SAP for the Conservation of Aquatic Ecosystems and Sustainable Management of the Natural Resources in the Lake Baikal Basin will be conducted through select, authorized ministries of water and the environment in Mongolia and Russia. The SAP will consist of many separate projects and activities, funded through a wide range of mechanisms and with greatly varied scopes of work and outcomes. However it is essential to recognize that ultimately the ownership and responsibility for the success of the SAP, reside with the ministries who agree to undertake the SAP.

Implementation activities will take place at both the national and transboundary levels. Multiple ministries will be involved in implementation. There is therefore the need to develop high levels of communication and cooperation both at the inter-ministerial level within each nation, as well as on the bi-national level. This section describes the approaches and conditions for effective implementation of the SAP (Section 4.1), the proposed cooperative mechanisms and institutional arrangements (Section 4.2), the implementation steps (Section 4.3), funding and sustainability of the SAP (Section 4.4) and monitoring and evaluation of the programme (Section 4.5).

4.1 Approaches and Conditions for Effective Implementation

Underlying the SAP is the recognition of the need for integrated management of what might appear to be single sector problems, but are in fact multi-sectoral in nature. In addition, the cause of environmental threats often involves complex socioeconomic and political situations, which usually require multidimensional solutions.

The process of SAP implementation typically occurs in three phases, which are described below. These phases are general in character and may not necessarily apply to all aspects of the programme. Several components of the SAP are more advanced in some countries than in others, and some steps of the implementation process might be skipped.

Catalytic phase: Action is taken to address key priorities that are essential to the success of the programme and that lay the foundation for the next phase.
Mainstreaming phase: Major components of the strategy are incorporated into the programmes of responsible agencies and stakeholders.
Consolidation and long-term sustainability phase: Long-term objectives of the programme are achieved and their sustainability ensured.

The SAP will be implemented through the strategic actions articulated in the previous section. These can be classified in the broad areas of coordinated monitoring and modeling programmes, legislative and institutional strengthening, adoption of technologies suited to resource and environmental conservation, improved public awareness and concern, and improved management practices. The catalytic phase of SAP implementation will require building the systems required to support these initiatives. These include:

- Infrastructure
- Public Support
- Legislative Support

Examples of infrastructure needs are databases to monitor verifiable indicators, communication infrastructure, and strengthening of capabilities for inter-agency cooperation both at national and regional

levels. Public and legislative support require recognition that ecosystem protection may not have obvious short-term benefits, and even the long-term benefits may not be clear in terms of improved economic prosperity or simple returns on financial investments. It will be necessary to build political support for the policy changes necessary for effective implementation of the SAP.

A necessary precursor to building public and legislative support is to engage stakeholders at all levels (state sector, commercial sector, civil society) from both Russian and Mongolian sides in the preservation of uniqueness of the Lake Baikal basin ecosystem. It is important to understand that risk of interest conflict among those groups is particularly high in the situations where economic interests contradict environment protection interests.

The main task of the State authorities should be the solution of sustainable development problems by addressing socio-economic challenges, pursuing environmental protection considering the ecological peculiarities of the region, and securing rational exploitation of natural resources. The states should encourage the development of green technology through economic support and subsidy. Those facilities which do not meet modern ecological requirements, should be modernized or phased out in time.

Regional strategic planning can be the most adequate instrument which is based on strategic monitoring and is able to consolidate efforts of administration and society in solution of socio-economic problems.

4.2 Proposed Cooperative Mechanisms and Institutional Arrangements

SAP implementation will take advantage of international conventions and transboundary agreements which are already in place. The 1995 bilateral agreement on Protection and Use of Transboundary Waters addressed all of the key elements required for SAP implementation, including environmentally sound water resource management practices, joint research programs, data sharing, and pollution prevention programs. The formation of the Joint Working Group set the necessary precedent for cooperative bi-national planning. The 2011 signing of the Protocol for Bilateral Collaboration established an early milestone in steps to harmonize monitoring methods and develop lists of controlled pollutants and water quality standards.

With these agreements in place, SAP implementation will proceed with the strengthening of institutional mechanisms for integrated natural resource management envisioned in Target 1 of the strategic actions (Table 2). While many of the activities of SAP implementation will be conducted at national or local levels, a high level of bilateral cooperation is necessary to establish joint monitoring and modeling programs, host data sharing platforms, and assure harmonization of scientific and policy protocols. This bilateral entity will also be responsible for overall SAP coordination and for maintaining the records necessary for proper monitoring and evaluation of SAP performance.

The particular strategy for bilateral cooperation has yet to be determined, however an analysis of the current situation, and options for the necessary institutional arrangements, has been conducted recently[14]. This study identified two options for bilateral cooperation appropriate for implementation of this SAP: Option 1 considers application of existing agreements, with transboundary SAP activities endorsed by the current Bilateral Commission. Option 2 outlines a new and more detailed bilateral agreement which is consistent with current international norms for transboundary water resource management. Undoubtedly implementation of the SAP will need to be modified to fit the institutional arrangements that will be selected. However the institutional mechanisms proposed in Target 1 (Table 1 and Annex I) have sufficient flexibility to adapt to changing bilateral arrangements.

4.3 Sustainability and Funding

The sustained success of the Lake Baikal Basin SAP will be built on a funding profile which establishes a mix of external donor support and bi-national financial commitments in the Catalytic stage of SAP implementation, followed by a planned transition to internal funding sources as implementation moves through Mainstreaming and Consolidation phases of implementation.

The ultimate success of the programme will depend on how well the proposed strategic actions are integrated into bilateral, national, and local planning efforts. Considerable progress has already been made

[14] The Current Status and Options for Enhancing the Legal and Institutional Frameworks of Cooperation in the Protection and Sustainable Management of Transboundary Waters between the Russian Federation and Mongolia. http://baikal.iwlearn.org/en/project/steering-committee/second-meeting/minutes-in-english-annex-3-rf-mongolia-water-concept-paper-summary/at_download/file

to coordinate planned and on going public-sector activities into SAP strategic actions. This can be seen in the level of co-financing that has already been identified for the SAP. Annex I provides a listing of strategic actions and performance indicators. For nearly every performance indicator, some level of integration into public-sector planning has been identified, which can also be identified as a source of co-funding.

In addition to integrating the goals and activities of public-sector contributions to the SAP, a variety of other economic factors will be engaged in the implementation of the SAP. These include external donor and private-sector contributions. Obtaining donor commitments for early activities will require the development of a SAP implementation plan which articulates the scope, duration, impacts, and budgets of a set of clearly defined strategic actions. Each strategic action will need to include justifications which the context for the action, the expected outcomes, the broader, long-term impacts of the action, and quantifiable performance indicators. This approach is drafted in the performance indicator framework provided in Annex I.

Developing sustained support for SAP implementation will require recognition of the economic value of a healthy and diverse Lake Baikal Basin ecosystem. This concept has been termed “valuation of ecosystem services” and provides a compelling argument for maintaining ecosystem integrity. Commercial and recreational fisheries and tourism are the two economic sectors which benefit most directly from a healthy Baikal ecosystem, with agricultural and forestry sectors not far behind.

Translating the concept of the economic value of a healthy ecosystem into the practice of revenue generation will be an early and ongoing challenge in SAP implementation. One of the best methods of securing of effective nature resource management is to make it attractive in the eyes of target user groups. One example of effective management of the Lake Baikal basin resources can be development of the tourist industry. Tour operators can capitalize on this region considering its uniqueness. Visitors can highly evaluate virginity and beauty of the landscape, and the cultural originality. Business and the local population can participate in the economic benefits of preserving the Lake Baikal Basin’s primeval resources.

To implement the SAP, considerable investments will need to be made in more environmentally friendly technologies and practices. Creation of a modern ecological monitoring system and transition of enterprises and other organizations to the best available technologies require considerable investment. At the same time, results of economic activity based on exact knowledge and forecast, use of modern nature- and energy-saving technologies are many times more effective than existing level of production. Moreover, new technologies enable us to prevent environmental pollution, keep health and preserve nature for future generations.

4.4 Implementation Steps

SAP implementation will be incremental and progressive and will start with the endorsement of the SAP at the ministerial level. After endorsement, national and bi-national deliberation will then designate the ministries responsible for implementation of the SAP. Several steps can then be conducted in parallel. These include building support within national and local government agencies, developing a SAP implementation plan, assembling donors for initial SAP activities, and organizing a bi-national group to oversee and coordinate SAP activities.

The SAP implementation plan will be built on this SAP document and will better define the strategic actions, establish baseline conditions for performance indicators (Annex I), and will refine quantitative measures for performance indicators.

Early activities of the bi-national group will be to work toward defining harmonized monitoring plans for ecosystem health and providing an information infrastructure for centralized data collection, modeling, and interpretation. This database will support scientific investigations and monitoring and evaluation of programme activities. The group will also work toward harmonizing regulations and environmental standards relative to bi-national aspects of the programme.

Bi-national cooperation is also necessary to work with stakeholders to define priorities for implementation and establish timelines for accomplishing strategic actions. The bi-national group will assist in identifying donors and developing strategies for sustained funding. The group will also provide consistency and open channels of communication as stakeholders work toward their national goals and strategic actions.

As the SAP matures through the Mainstreaming phase and into the Consolidation phase, SAP activities will be coordinated more through the stakeholder groups responsible for implementation and less through the bi-

national group overseeing the SAP. This transition in “ownership” of the SAP elements will reflect the internalization of SAP principles into the governmental and private entities involved in SAP implementation.

4.5 Monitoring and Evaluation of SAP Implementation

All SAP activities will undergo an ongoing process of monitoring and evaluation to be conducted by the project coordination unit (PCU). At the onset of SAP implementation, a project document will be developed using a logical framework which will define measurable outputs and outcomes. Progress will be measured against baseline conditions using quantitative performance indicators for each activity. The performance indicators listed in Annex I provide a model for the development of a more complete and comprehensive set of indicators during the first stages of SAP implementation.

Three primary performance indicators[15] will be used:

- ***Process Indicators (PI):*** Focus on outputs that are likely to lead toward a desirable outcome.
- ***Stress Reduction Indicators (SRI):*** Relate to project objectives or outcomes.
- ***Environmental Status Indicators (ESI):*** Goal oriented and focus on improvements in ecosystem quality.

The progress of SAP implementation will be evaluated in the short term (on an annual basis) by assessing the performance indicators to evaluate outputs. In the longer term (on a multi-year basis) a theory-of-change approach will be used to evaluate progress toward achieving outcomes.

[15] GEF Transboundary Diagnostic Analysis / Strategic Action Programme Manual, Volume 2, 21 March 2013.

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Annexes

Annex I Result-based Indicator Framework

Indicator type:

- PI Process Indicator
- SRI Stress Reduction Indicator
- ESI Environmental Status Indicator

Strategic Component 1 indicators

Strategic Actions	Indicator	Indicator type	Timeframe	Cost
Protection, Restoration, and Management of Critical Aquatic and Terrestrial Habitats				
Target 1. Strengthening institutional mechanisms for integrated natural resource management. **Priority** – High.				
Strategic Action 1.1 Improvement of legal and institutional framework in the field of environmental protection and sustainable nature management in the transboundary basin of the Lake Baikal (Strategic)	The existing legal and institutional framework in the field of environmental protection and sustainable nature management in the transboundary basin of the Lake Baikal have been improved through enhancement of mechanisms of cooperation between the Russian Federation and Mongolia (bilateral agreements, intergovernmental commission). Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic targets 2 & 3.	PI	1-5 years	$$$
Strategic Action 1.2. Creation of a Russian-Mongolian mechanism of coordination and implementation of this SAP. (Strategic)	A Russian-Mongolian mechanism for SAP coordination and implementation has been created in the framework of existing bilateral agreements between Russia and Mongolia	PI	1-5 years	$$
Strategic Action 1.3. Development of mechanisms for gathering and analysis of harmonized information about	Mechanisms for gathering and analysis of harmonized information on state of the lake Baikal basin natural resources have been developed and approved by the governments of both countries (considering the existence of information transfer mechanisms within the scope of bilateral agreements).	PI	1-5 years	$$$

the state of natural resources in the Lake Basin Baikal. (Strategic)				
Strategic Action 1.4. Creation of a harmonised system of transboundary monitoring for terrestrial ecosystems of the Lake Baikal Basin. (Strategic)	Increase by a factor of 1.5 the number of monitoring sites on transboundary terrestrial ecosystems. Mongolian co-financing: National development program on Meteorology, Hydrology & Environmental Monitoring until 2015. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-5 years	$$$
	Periodic monitoring projects in selected ecosystems are conducted jointly by Russia and Mongolia. Mongolian co-financing: National development program on Meteorology, Hydrology & Environmental Monitoring until 2015	PI	1-5 years	$$
Strategic Action 1.5. Strengthening of role of the Russian-Mongolian Joint Information Centre. (Supplementary)	Status of the Baikal Information Center has been defined within the scope of intergovernmental agreement between Russia and Mongolia. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic target 3. Russia co-financing: in the course of agreement.	PI	1-5 years	$$
Target 2. Awareness of the importance of aquatic and terrestrial habitats protection. **Priority -** Very High.				
Strategic Action 2.1. Preparation of information about uniqueness of regional and landscape biological diversity of aquatic and terrestrial habitats in the Lake Baikal basin. (Strategic)	Increase by 20% the number of publications performed under the Program, in Mongolian, Russian, and foreign mass media about the idea of biodiversity of aquatic and terrestrial habitats in the Lake Baikal basin. Mongolia co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 234, Action 1 & 4. Russia co-financing: Federal Target Program "Research and development in priority areas of scientific-technical progress for 2014-2020".	PI	1-5 years	$$$
Strategic Action 2.2. Creation of universally accessible and regularly updated information systems and databases based on primary information about environmental pollution and man-	Increase by a factor of 5 the segment of municipalities, included into automated (federal and regional) public warning systems. Mongolian co-financing: National Program on Capacity Building on Disaster & Risk management, Second phase 2015-2020, Target 2 & 3. Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety.	PI	1-5 years	$$$

made impact on ecosystems of the Lake Baikal basin. (Supplementary)	Increase by 30% monitoring for ecosystem threats caused by natural events (such as floods) or accidents which impact industrial or other man-made facilities. Mongolian co-financing: National development program on Meteorology, Hydrology & Environmental Monitoring until 2015 Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety".	SRI	1-10 years	
Strategic Action 2.3. Elaborate and comply with rules "On civil behaviour in clean environment". (Supplementary)	Increase by 50% the number of citizens who are aware of the rules of civic behaviour in clean environment, as measured by an expert survey. Mongolia co-financing: National Environmental Action Plan of Mongolia 2012-2021, Strategy 7 (Investment in the development of infrastructure for the protection of nature and environment and living condition of the citizens will be increased); and Mongolian Government Action Plan 2012-2016, Target 85, Action 3. Russia co-financing: Federal Target Program "Development of education for 2013-2020".	PI	1-5 years	$$
Strategic Action 2.4. Creation of possibilities for the public and population to obtain full information regarding condition of the environment and man-made impact of all sources of waste water discharge, emissions and solid waste. (Strategic)	Increase by 50% the population provided with information and alerting in case of emergency or threats. Mongolian co-financing: National Program on Capacity Building on Disaster & Risk management, Second phase 2015-2020, Target 2 & 3. Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety".	SRI	1-5 years	$$
	Increase to 100% coverage for populations in municipalities of the system, which informs and alerts about threat of emergency. Mongolia co-financing: National Environmental Action Plan of Mongolia 2012-2021, Priority Project 29; and Mongolian Government Action Plan 2012-2016, Targets 54, 55, Actions 3, 8. National Program on Capacity Building on Disaster & Risk management, Second phase 2015-2020, Target 2-3. Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety".	SRI	1-5 years	$$
Strategic Action 2.5. Publication in scientific journals and mass media of new scientific studies on the impacts of natural and man-made impacts on aquatic	Increase by 50% the number of publications in mass media and scientific periodicals on environmental issues in the Lake Baikal basin. Mongolia co-financing: Mongolian Government Action Plan 2012-2016, Target 94, Action 1; Action Plan to implement "Water" National Programme 6.9. Russia co-financing: Federal Target Program	PI	1-10 years	$$

and terrestrial habitats in the Lake Baikal basin. (Supplementary)	"Research and development in priority areas of scientific-technical progress for 2014-2020".			
Strategic Action 2.6. Announcements in mass media about administrative and economic actions as well as penal sanctions in cases of grave violation of environmental protection laws of the Lake Baikal basin. (Supplementary)	20% increase in the number of publications in mass media about actions of administrative, economic and penal sanctions in case of grave violation of environmental protection laws. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 2. Russia co-financing: Federal Target Program "Development of judicial system of the Russian Federation for 2013-2020".	PI	1-10 years	$$
Strategic Action 2.7. Organization of scientific conferences and festivals dedicated to protection and rational use of natural resources, as well as to friendship of nations living on the territory of the Lake Baikal basin. (Supplementary)	Increase by 25% the number of trainees on ecological programs of preschool, elementary, main general and secondary general education. Mongolia co-financing: Mongolian Government Action Plan 2012-2016,Target 85, Action 3. Russia co-financing: State Program "Development of education for 2013-2020"; Federal Target Program "Development of culture and tourism for 2013-2020".	PI	1-5 years	$$
	Inclusion of ecology into curriculums of elementary and secondary educational and professional educational institutions. Mongolia co-financing: National Programme on "Public ecological education" 1997/255.	PI	1-5 years	$
Strategic Action 2.8. Organize scientific conferences and festivals dedicated for effective use of water and other natural resources and friendship of nations. (Supplementary)	Increase by a factor of 2 in the numbers of conferences, symposia, and exhibitions dedicated to the theme of nature protection in the Lake Baikal basin. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. 5.2.1.5. Russia co-financing: Federal Target Program "Development of culture and tourism for 2013-2020"; Federal Target Program "Research and development in priority areas of scientific-technical progress for 2014-2020".	PI	1-5 years	$$
Target 3. Improved Protected Area management and expansion of the Protected Area network. **Priority** – High.				
Strategic Action 3.1. Harmonization of the Russian and Mongolian national legislatures regarding regulation of protected areas. (Strategic)	A feasibility study has been conducted to determine the policy changes necessary within each country to harmonize regulation of protected areas. Mongolian co-financing: National Program on Protected Areas; Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 231, Action 1.	PI	1-5 years	$$
	National policies regarding the regulation of protected areas have been harmonized.	PI	1-5 years	$$

	Mongolian co-financing: National Program on Protected Areas; Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 231, Action 1.			
Strategic Action 3.2. Expansion of the chain of national protected areas and creation of transboundary protected areas in the Lake Baikal Basin. (Strategic)	Increase by 15% the area of national Protected areas and creation of transboundary protected areas in the Lake Baikal basin. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 232, Action 4. Russia co-financing: State Program "Environment protection".	ESI	1-10 years	$$$
Strategic Action 3.3. Enhancement of the legal responsibility for violations of environmental standards in a protected area and enforcement of existing environmental standards. (Strategic)	The legal responsibility for violations of environmental standards has been reviewed to responsibility enhancement within the scope of appropriate legal and institutional mechanisms in Russia and Mongolia. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 2.	PI	1-5 years	$$$
	Reduce by 25% the number of organizations which negatively impact the environment. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 40, Action 1; Target 47, Action 2. Russia co-financing: State Program "Environment protection".	PI	1-5 years	$$$
Target 4. Enhance the role of rational technologies and natural resource management. **Priority** - Very High.				
Strategic Action 4.1. encourage available ecologically safe practices. (Strategic)		PI	1-5 years	$$$
	Increase by 20% the amount of enterprises, implemented up-to-date ecologically safe technologies in the lake Baikal basin. Mongolian co-financing: National Program on Quality & Environmental Management /GD-146/ Russia co-financing: State Program "Environment protection".	PI	1-5 years	$$
Strategic Action 4.2. Use best available technologies for public and industrial water supply and waste water disposal including maximum use of recirculating water supply. (Strategic)	Increase by 20% the number of water supply and sanitation facilities, which adopted best available technologies to reduce pollution discharge. Mongolia co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 54. Action Plan to implement "Water" National Programme, 6.2. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-5 years	$$$

Strategic Action 4.3. Provide economic incentive for land users who utilize non-waste, energy-saving and other technologies with minimal environmental impact. (Strategic)	The number of enterprises using waste-free or energy-saving technologies has been increased by 20%. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 48, Action 1; Target 239, Action 1 & 2. National Program on Quality & Environmental Management /GD-146/	PI	1-5 years	$
	The number of waste-free or energy-saving technologies adopted has been increased by 20%.	PI	1-5 years	$
Strategic Action 4.4. Introduction of international standards on environmental management at enterprises and in organizations. (Supplementary)	20% increase in the number of enterprises, locatedin the Lake Baikal Basin territory which have implemented the system of international standard on environmental management. Mongolian co-financing: National Program on Quality & Environmental Management /GD-146/ Russia co-financing: State Program "Environment protection".	PI	1-10 years	$$$
Target 5. Sustainable Management and ecologically friendly development in agricultural and urban areas. **Priority** – High.				
Strategic Action 5.1. Establish environmental zoning in order to attain optimal placement of industrial and other objects minimizing their damage to the environment. (Supplementary)	50% increase in the number of rural area settlements for which zoning was set considering ecological limitations . Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 240, Action 1. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	PI	1-5 years	$$$
	30% increase in thenumber of village areas for which zoning was set considering ecological limitations. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 1. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	PI	1-5 years	$
	50% increase of number of urban territories for which zoning was set considering ecological limitations. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 1. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	PI	1-5 years	$

Strategic Action 5.2. Include rural and urban sustainable development objectives into strategies of national and regional development. (Supplementary)	The challenges of sustainable development of rural and urban settlements have been included in the strategy of national and regional development. Mongolia co-financing: Mongolian Government Action Plan 2012-2016, Target 12, Actions 1-4. Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 1.	PI	1-5 years	$$$
Strategic Action 5.3. Delineation of water body buffer zone borders in settlements and realization of legislative requirements. (Supplementary)	The number of settlements with normative fixed borders of water body buffer zones reached the 40% level. Mongolia co-financing: Action plan to implement "Water" National Programme 1.3. Russia co-financing: Subventions from the federal budget to the budgets of subjects of Russia for implementation of certain authorities of Russia in water issues.	SRI	1-5 years	$$$
Target 6. Decline of deforestation and desertification levels. **Priority** - Very High.				
Strategic Action 6.1. Enhance the existing nature protection legislation (Forestry Code, Land Code, etc.) in the Russian Federation and Mongolia to harmonize nature protection provisions and provision of incentives for eco-technologies. (Strategic)	Where needed, enhance regulatory acts in the sphere of ecology and natural use for the purpose of stimulating development of ecological technologies.	PI	1-5 years	$$$
Strategic Action 6.2. Develop and implement a forest monitoring (including remote sensing) system including: • monitoring of forest resources (forest pathology monitoring); • forest fire monitoring; • monitoring of forest conditions in technogenic pollution zones; • phytodiversity monitoring. (Strategic)	Increase by a factor of 2 the territory where the national standard system of forest monitoring has been created and maintained. Mongolia co-financing: "Forest thinning" National Programme, Objective 1. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
	Increase by 50% the forest resources square where remote monitoring is implemented. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 233, Action 5. Russia co-financing: State program "Development of forestry for 2013-2020".	ESI	1-5 years	$$$
	Reduce by 30% territories, damaged by forest fires in the Selenga basin. Mongolia co-financing: Mongolian Government Action Plan 2012-2016, Target 36, Action 1.	ESI	1-5 years	$$$

	"Forest thinning" National Programme; Green Wall National Programme (2005-2035) Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".			
Strategic Action 6.3. Pass statutory acts for undertaking operative action and planning on prevention of deforestation, degradation and desertification. (Strategic)	Local and regional normative acts, which include forest monitoring data and data of desertification and land degradation in the Lake Baikal basin, have been adopted. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 43, Action 2; and National Plan of Action to Combat Desertification in Mongolia. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 241, Action 1; "Forest" National Programme. Russia co-financing: State program "Development of forestry for 2013-2020".	PI	1-10 years	$$$
Strategic Action 6.4. Initiate forest protection to preserve healthy and intact forest and implement initiatives for forest pathology control, inventory and prediction of pests and forest disease, as well asneeded prophylaxis for combating them. (Strategic)	Increase to 30% territories with healthy forests. Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 233, Action 4; "Forest" National Programme; Green Wall National Programme (2005-2035). Russia co-financing: State program "Development of forestry for 2013-2020".	PI	1-10 years	$$$
	Increase by 20% forest areas for which a survey of forest pathology and forest pest monitoring has been conducted. Mongolia co-financing: Action Plan of Mongolian Government 2012-2016, Target 36, Action 2. Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 233, Action 2; "Forest" National Programme. Russia co-financing: State program "Development of forestry for 2013-2020".	ESI	1-5 years	$$
Strategic Action 6.5. Increase forest production through reforestation to support household and industrial needs. (Strategic)	Increase by a factor of 2 reforestation areas. National programme "Forest thinning", 2016-2020, target 3.1, action 3.1.5. Russia co-financing: State program "Development of forestry for 2013-2020".	ESI	1-5 years	$$$
	Increase by 20% the area of reforestation in forests subject to clear-cutting. Mongolian co-financing: "Forest" National Programme; Green Wall National Programme (2005-2035). Russia co-financing: State program "Development of forestry for 2013-2020".			$$$
	3% increase of the forest fund in the Selenga River Basin. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 36,	ESI	1-10 years	$$$

	Action 5. "Forest" National Programme; Green Wall National Programme (2005-2035). Russia co-financing: State program "Development of forestry for 2013-2020".			
	5% increase of the forest funds in lake Baikal basin. Mongolian co-financing: "Forest" National Programme; Green Wall National Programme (2005-2035). Russia co-financing: State program "Development of forestry for 2013-2020".	PI	1-10 years	$$$
Strategic Action 6.6. Define zones vulnerable to desertification and conduct restoration activities. (Supplementary)	Increase by 50% of the land for which the monitoring and research on desertification have been conducted. Mongolia co-financing: National Action Plan for Combatting Desertification, 3.1.3 and 3.2.2.	PI	1-5 years	$$$
	Decrease by 25% the area affected by anthropogenic desertification. Mongolia co-financing: Program on combating desertification, 2016-2020, Goal 9.5, Actions 9.5.1-6. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	ESI	1-5 years	$$$
Strategic Action 6.7. Develop and implement regional development plans taking into account desertification and deforestation control. (Strategic)	Desertification and deforestation control has been included into regional development plans. Mongolia co-financing: National Action Plan for Combatting Desertification, 5.2.7.	PI	1-5 years	$$$
	Increase by 20% the area of lands in which desertification and deforestation control measures have been taken.	PI	1-5 years	$$
Strategic Action 6.8. Regulate the number of cattle and pasture load depending on pasture carrying capacity. (Supplementary)	Revised livestock management plan for regulation of the number of livestock and their population composition, depending on the pasture carrying capacity. Mongolia co-financing: National Action Plan for Combatting Desertification, 14.3.3.	SRI	1-5 years	$$$
	Regional plans include articles which consider adjusting of livestock population and pasture load based on pasture productivity. Mongolian co-financing: National Program on Mongolian Livestock, 3.4.1.	PI	1-5 years	$$
Strategic Action 6.9. Restoration of soil quality. (Strategic)	Increase by 30% the area of land restored. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 54. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	ESI	1-10 years	$$$

Target 7. Sustainable management of water resources, including enhanced public water supply. **Priority** – High.				
Strategic Action 7.1. Enhance the transboundary hydrological monitoring system of surface waters and groundwaters including the implementation of automated systems. (Supplementary)	The number of surface water monitoring stations, equipped with automated systems has been increased by 50%. National "Water" programme, 2016-2021, objective 3. Action 3.2.12 Russia co-financing: Federal Target Program "Development of water industry of the Russian Federation for 2012-2020".	PI	1-10 years	$$$
	Groundwater monitoring networks have been established and are sustainably functioning in the most vulnerable and densely populated three cities (e.g., regions of Ulaanbaatar, Ulan-Ude and etc.). Mongolia co-financing: National "Water" programme, 2016-2021, objective 3. Action 3.2.13.	PI	1-5 years	$$
Strategic Action 7.2. Apply principles of integrated water resource management in the development of new or enhanced community water supplies in the Lake Baikal basin. (Strategic)	Approaches to basinwide integrated water resource management have been developed. Mongolia co-financing: Action plan to implement "Water" National Programme, Activities 5.1 and 5.2 Russia co-financing: Federal Target Program "Development of water industry of the Russian Federation for 2012-2020".	PI	1-5 years	$$
	Not less than two facilities for the improvement of domestic water supply have been constructed in the Selenga river basin. Mongolia co-financing: National "Water" programme, 2016-2021, objective 3. Action 3.3.2. Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 3.	PI	1-5 years	$$$
Strategic Action 7.3. Reduction in use of technologies which have priority pollutants and highly hazardous substances for water supply and waste water disposal for all facilities and households in the Lake Baikal Basin. (Strategic)	Increase by 35% the number of water supply and sanitation facilities which do not use the technology, associated with extremely dangerous and highly dangerous substances. Mongolia co-financing: Action plan to implement "Water" National Programme, Activity 2.1 and 2.3. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-10 years	$$$
Target 8. Sustainable management of natural resources. **Priority** – High.				
Strategic Action 8.1. Estimate the ecological capacity of territories for anthropogenic	20% increase of the territories which have elaborated scientific justification of ecological capacity of the territory. Mongolian co-financing: Millennium Development Goals (MDGs)-based	SRI	1-10 years	$$$

impact, determine admissible anthropogenic impacts on these ecosystems, and manage ecosystems based on the impermissibility of exceeding ecological capacity. (Strategic)	Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 2. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020."			
	Increase by 20% territories for which admissible anthropogenic impact (ecological natural capacity) is legislatively established restrictions for issuance of permissions and plans for development of terrestrial and water habitats. Mongolia co-financing: National action plan for combatting desertification, 5.1.2 and 5.4.1 Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 2. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-10 years	$$$
	20% increase in the area where indicators of ecological capacity for commercial fish harvesting have been identified.	PI	1-10 years	$$
Strategic Action 8.2. Use of "green growth" indicators in the Lake Baikal Basin: (indicators for the monitoring of environmental assets, developed by OECD). (Strategic)	"Green development" indicators have been developed and are in regular use in the Lake Baikal Basin. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 218, Action 1	PI	1-10 years	$$$
	Number of projects, taking into account the indicators of green development increased to 50%. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 227, Action 1 & 3.	PI	1-10 years	$$
Strategic Action 8.3. Introduce mandatory environmental expertise of projects in the Lake Baikal Basin related to development, agriculture, fish hatcheries, and fish processing. (Strategic)	Number of projects in the Lake Baikal Basin, which employ ecological ecological expertise, increased by 50%. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-10 years	$$$
	40% increase of number of projects for which environmental impact assessment has been carried out (in the total number of all development projects for livestock, fish farming and fish processing, large projects agricultural expansion, agricultural products processing). Mongolia co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 2. Russia co-financing: State Program "Fisheries	PI	1-5 years	$$$

	industry development".			
Strategic Action 8.4. Introduce a mechanism of ecological risk insurance for large projects in Lake Baikal Basin. (Strategic)	Number of projects in the Lake Baikal Basin, which use ecological insurance, increased by 10%. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 2.	PI	1-5 years	$$$

Strategic Component 2 indicators

Strategic Actions	Indicator	Indicator type	Timeframe	
Reduction of Pollution and Improvement of Water Quality.				
Target 9 Reduction of point source environmental pollution from stationary and mobile pollution sources. **Priority** - Very High.				
Strategic Action 9.1. Increase responsibility of ship owners for violation of environmental legislation including discharge of wastes into the waters of the Baikal Basin. (Strategic)	Number of litigations opened, associated with discharge of waste, bilge waters, oils from ships into the waters of Lake Baikal and into the water bodies of its basin decreased by 25%.	PI	1-10 years	$$$
Strategic Action 9.2. Creation of solid waste collecting networks and sanitary checkpoints on urbanized rural territories, along the railroads and highways. (Strategic)	30% decrease of total area of the Lake Baikal basin, subjected to high and extremely high solid-waste pollution. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Targets 32 and 42, Actions 1 and 2; National Environmental Action Plan of Mongolia 2012-2016, 10-5. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
		PI	1-10 years	$$$
	Amount of solid waste unprocessed and not located on landfills in the lake Baikal basin has been reduced by 50%. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Targets 32 and 42, Actions 1 and 2; National Environmental Action Plan of Mongolia 2012-2016, 10-5.	ESI	1-5 years	$$$

	Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".			
	Number of solid waste collecting networks and points in towns and administrative capitals has been increased by 50%. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 21, Action 2. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-5 years	$$$
	Amount of sanitary checkpoints has been increased by 50%. Mongolia co-financing: National Environmental Action Plan of Mongolia 2012-2021, Priority Project 5; Action plan to implement "Water" National Programme 4.4.	SRI	1-5 years	$$
Strategic Action 9.3. Develop the paved network roads. (Supplementary)	20% increase of length of hard roads. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 14, 17-19. Russia co-financing: Federal target program "Development of transport system of Russia for 2010-2020"; Program of socio-economic development of the Republic of Buryatia.	PI	1-10 years	$$$
Strategic Action 9.4. Reduction of hazardous substance discharge volume in boundaries of water protection zones and territories around large residential areas, industrial and infrastructural objects. (Supplementary)	Pollution consisting of all categories of contamination (including high and extremely high pollution) from industrial centers along highways, has been decreased by 30% in a 100-meter zone around major settlements. Mongolia co-financing: Action plan to implement "Water" National Programme 1.5-1.6. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
	50% decrease in the discharge of hazardous substances, classified as high and extremely high pollutants, in theLake Baikal ecosystem within water body buffer zones. Mongolia co-financing: Action plan to implement "Water" National Programme 1.10. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-5 years	$$$
	Area of water protection zone covered by sanitary control has been increased by 30%. Mongolia co-financing: Action plan to implement "Water" National Programme 1.9. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic	ESI	1-5 years	$$

	development of Baikal nature territory in 2012-2020".			
Strategic Action 9.5. Repair urban and rural storm water, sanitary sewer, and solid waste systems. (Strategic)	Twofold increase of sewage systems which meet modern requirements. Mongolia co-financing: Action plan to implement "Water" National Programme 4.1-4.2 Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-5 years	$$$
	Number of upgraded storm and wastewater sewerage systems has been increased by 30%. Mongolia co-financing: Action plan to implement "Water" National Programme 4.13. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-5 years	$$$
	Number of urban and rural areas, which upgraded wastewater treatment system, increased by 30%. Mongolia co-financing: Action plan to implement "Water" National Programme 4.3-4.8. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
	Number of urban and rural areas, which upgraded solid waste treatment facilities, increased by 50%. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 41, Action 1. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
	Two solid waste or wastewater treatment plants in Selenga river basin have been constructed. Mongolia co-financing: Action plan to implement "Water" National Programme 4.5.	PI	1-5 years	$$$
	Twofold increase of amount of waste processed by waste recycling companies. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 42, Actions 1 and 2.	PI	1-5 years	$$$
	Twofold increase of treatment facilities which adopt best available technologies. Mongolia co-financing: Action plan to implement "Water" National Programme.	PI	1-10 years	$$
Strategic Action 9.6. Increase governmental support for the use of local wastewater	State funding of the construction of local treatment facilities has been increased by 20%. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 41, Action 1; and Action plan to implement "Water"	PI	1-5 years	$$

treatment plants. (Strategic)	National Programme 4.7. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".			
	Number of local treatment facilities has been increased 2 fold. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	SRI	1-5 years	$$$
	Volume of treated sewage which meets the ecological requirements has been increased 2 fold. Mongolia co-financing: Action plan to implement "Water" National Programme: Part 4: For improving wastewater treatment plants and water recycling. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
Strategic Action 9.7. Encourage transition to alternative fuels. (Strategic)	20% increase of the amount of environmental friendly fuels. Russia co-financing: State Program "Power efficiency and development of energetics".	PI	1-10 years	$$$
	20% increase of the amount of natural gas, used by the population in the Selenga River Basin. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	PI	1-10 years	$$$
	Share of alternative fuels (instead of wood) increased by 40%. Russia co-financing: State Program "Power efficiency and development of energetics".	PI	1-10 years	$$$
	10% increase of number of ships on water objects of the Lake Baikal basin, fueled by compressed or liquefied gas and batteries.	PI	1-10 years	$$$
	Increase to 20% of the number of objects that use alternative fuels. Mongolia co-financing: National programme on renewable energy, Objective 4.2. Russia co-financing: State Program "Power efficiency and development of energetics".	PI	1-10 years	$$$
Strategic Action 9.8. Construct facilities and special sanitation ships for collecting domestic waste and waste water in the Lake Baikal and Lake Khovsgol Basins. (Supplementary)	Increase to 50% shore-based facilities and vessels for receiving of waste and bilge water in the Lake Baikal basin and the Khovsgol basin.	PI	1-10 years	$$$

Target 10. Reduction of pollution levels from agriculture and non-point sources. **Priority** – High.				
Strategic Action 10.1. Develop and disseminate the best practice recommendations to use environmentally friendly agrochemicals, including time and speed of their use, their handling, storage and ultimate disposal. (Supplementary)	Volume of the use of environmentally detrimental fertilizers in agriculture has been decreased by 30%. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	PI	1-10 years	$$$
	Use safe agrochemicals on at least 50% of total agricultural area under cultivation. Russia co-financing: Program "Development of agriculture and regulation of market of agricultural goods, raw materials and food for 2013-2020".	PI	1-5 years	$$
	Recommendations for the use of environmentally sound agricultural chemicals in lake Baikal basin have been developed and disseminated to stakeholders. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 45, Action 2.	PI	1-5 years	$
	Preferences have been established for companies producing and distributing ecological friendly agrochemicals Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 45, Actions 1 and 2.	PI	1-10 years	$$
Strategic Action 10.2. Increase control over the use of fertilizer, pesticide, herbicides and other chemicals, and prevent their use where appropriate. (Strategic)	Uniform standards of quality, quantity and the maximum permissible use of fertilizers, pesticides and other chemicals in agricultural activities in the Lake Baikal basin have been introduced.	PI	1-5 years	$$$
	The list of prohibited chemical fertilizers and pesticides in the Lake Baikal Basin has been developed. Mongolia co-financing: Mongolian National Implementation Plan of POPs, Target 1-1.2.	PI	1-5 years	$
	Use of inorganic fertilizers such as dolomite and zeolite has been increased by 5%.	PI	1-5 years	$$$
Strategic Action 10.3. Conduct research on the impact of chemical fertilizers on soils. (Supplementary)	The use of chemical fertilizers in the basin of Lake Baikal, with the identification of oversaturated areas, has been assessed.	PI	1-5 years	$$
	Number of publications assessing the implications of the intensive use of chemical fertilizers and recommendations has been increased by 50%.	PI	1-5 years	$$
Strategic Action 10.4. Strategy development for (dead) livestock disposal in the Lake Baikal Basin. (Supplementary)	A strategy for the disposal of dead livestock for the entire Lake Baikal Basin has been developed.	PI	1-5 years	$$
	50% increase of the amount of cattle mortuaries constructed.	ESI	1-5 years	$
	At least five pilot demonstration projects for utilization of dead livestock have been implemented.	ESI	1-5 years	$$
Target 11. Reduction of pollution from mining. **Priority** - Very High.				

Strategic Action 11.1. Monitor and control soil, surface water and ground water pollution, and elaborate measurement and technology solutions for effective use of mineral resources. (Strategic)	At least 80% of the mining enterprises have adopted monitoring programmes for soil and groundwater pollution Russia co-financing: State program "Reproduction and use of nature resources".	PI	1-5 years	$$$
	Amount of polluted wastewater from the mining industry has been reduced by 30%. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-10 years	$$$
	Volume of emissions from the mining industry has been reduced by 20%. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-10 years	$$$
	2-fold increase of the number of patented technologies for the rational use of mineral resources.	PI	1-10 years	$
	Area of modified landscapes as a result of the mining industry operation by improving of the landscape plans has been reduced by 5%.	ESI	1-10 years	$
Strategic Action 11.2. Improve monitoring and control of mercury use and cyanide contamination in gold mining factories. (Strategic)	90% of gold mining companies have adopted monitoring and control systems for cyanide. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-5 years	$$
	Release of cyanide into the environment as a result of gold mining has been reduced by 90%.	ESI	1-5 years	$$
	30% increase of number of enterprises that are certified in accordance with the requirements of the International Cyanide Management Code (ICMC). Russia co-financing: State program "Reproduction and use of nature resources".	PI	1-10 years	$
	2-fold increase of the volume of production of gold mining companies (in natural units) using the best available technologies. Mongolia co-financing: Action plan to implement "Water" National Programme 6.2.	PI	1-10 years	$$
	Where needed, to make changes in normative legal acts, regarding control of the cyanide discharge and use of mercury compounds.	PI	1-10 years	$
Strategic Action 11.3. Use environmentally friendly technologies in construction of access ways and other infrastructure to mining facilities. (Strategic)	30% increase (further 80% increase) of the amount of mining enterprises, using environmentally friendly technologies during of construction of access roads and other infrastructure to its facilities. Mongolia co-financing: Action plan to implement "Water" National Programme 6.2.	PI	1-5 years	$$$
Strategic Action 11.4. Implement water reuse in	60% of mining enterprises use technology for water reuse. Mongolia co-financing: Action plan to	ESI	1-5 years	$$$

mining enterprises. (Strategic)	implement "Water" National Programme 6.2.			
Strategic Action 11.5. Apply resource-saving and non-waste technologies in the mining industry. (Strategic)	35% increase of number of enterprises that embed the best available practices of use of resource- and non-waste technologies. Mongolia co-financing: Action plan to implement "Water" National Programme 4.7.	PI	1-10 years	$$$
Strategic Action 11.6. Include land reclamation into mining projects and enhance the legal responsibility for violations related to the failure of remediation after project completion. (Supplementary)	80% increase in the number of mining projects that restore the initial state and rehabilitation of mining sites after completion of the project. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 38, Actions 1 and 2.	PI	1-10 years	$$
Strategic Action 11.7. Provide post-accident clean-up in the mining industry, including rehabilitation of ecosystems and wildlife. (Supplementary)	100% provision of mining enterprises with necessary resources for remediation of mining accident consequences, including the rehabilitation of terrestrial environment and wildlife objects. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 38, Actions 1 and 2.	PI	1-5 years	$$$
Strategic Action 11.8. Increase the responsibility for illegal artisanal mining. (Strategic)	Amendments to the Administrative and Criminal Codes, toughening responsibility for illegal mining.	PI	1-5 years	$$
Strategic Action 11.9. Implement pilot projects that use environmental friendly mining technologies. (Supplementary)	At least five pilot projects to demonstrate the use of environmentally safe mining technologies have been implemented.	PI	1-5 years	$$$
Target 12. Reduction of pollution from tourism and recreational activities. **Priority** - Very High.				
Strategic Action 12.1. Enhance monitoring to assess the impact of tourism and recreation on the environment. (Supplementary)	Partnerships have been created between organizations that provide touristic services and municipalities.	PI	1-5 years	$$
	15% increase of number of respondents evaluating tourist and recreational activities in the region as environmentally safe. Russia co-financing: State program "Development of culture and tourism for 2013-2020".	PI	1-5 years	$$
	50% increase of number of public environmental inspectors.	PI	1-5 years	$
Strategic Action 12.2. Formulation of proposals to the regional programs of socio-economic development,	Area of illegal dumps has been reduced by 50%. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-10 years	$

dealing with reduction of pollution level coming from tourist and recreational activity, and creation of sanitation control stations in tourist zones. (Supplementary)	Area where "back-country" tourism covered by a system of permanent collection of solid waste has been increased by 45%. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	ESI	1-5 years	$$$
	Number of upgraded wastewater treatment facilities for the tourism and recreation has been increased by 50%. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 7, Action 1. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-5 years	$$$
	At least 80% of tourist objects have treatment facilities. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 7, Action 1 Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-10 years	$$$
Strategic Action 12.3. Convert to sustainable tourism and recreation. (Strategic)	15% increase of the number of objects of tourist and recreational businesses which meet with the principles of environmental safety. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 7, Action 1. Russia co-financing: State program "Development of culture and tourism for 2013-2020".	PI	1-10 years	$$$
	45% increase of the territory with tourist and recreational facilities belonging to the "clean" category. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 7, Action 1. Russia co-financing: State program "Development of culture and tourism for 2013-2020".	ESI	1-5 years	$$$
Strategic Action 12.4. Expand the "Great Baikal Trail" project and the international route Khovsgol-Baikal project implementation; hand over completed facilities to municipal or commercial organizations for use.	20% increase in the length of the route "Great Baikal Trail" and the international route Khovsgol-Baikal.	PI	1-10 years	$$$

(Supplementary)				
Strategic Action 12.5. Strengthen the role of landscape planning in tourism. (Strategic)	Increase to 40% the amount of tourism and recreation projects implemented on the basis of landscape plans.	PI	1-10 years	$$$
Strategic Action 12.6. Establish and implement for purposes of management of recreational objects maximum admissible environmental pressure levels for recreational areas. (Strategic)	40% increase of the territories, which have normative regulated indicators of capacity of recreational areas to determine the maximum permissible loads. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 7, Actions 1 and 2.	PI	1-5 years	$$$
	A control system for recreational areas has been developed, which takes into account the maximum allowable environmental load. Mongolia co-financing: Action plan of Mongolian Government 2012-2016, Target 7, Action 1.	PI	1-5 years	$

Strategic Component 3 indicators

Strategic Actions	Indicator	Indicator type	Timeframe	
Sustainable Use of Fisheries, Game and Other Wildlife Resources				
Target 13. Enhancement of control, protection and system of management of fisheries, hunting and other wildlife resources. **Priority** - Very High.				
Strategic Action 13.1. Identify and monitor bio-resources and wildlife. (Strategic)	40% increase of coverage of the Lake Baikal basin territory with environmental monitoring, including: - Monitoring of water biological resources and their habitat; - Monitoring of wild life objects and their habitat; - Monitoring of hunting and resources and their habitat; - Forest pathology monitoring. Mongolian co-financing: National Program on Protection of Round fish & its breeding, 2.2.2; Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 5. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-10 years	$$$
	10% increase of number of identified endemic plant and animal species in the waters of Lake Baikal and Khovsgol, and their coastal areas. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its	ESI	1-10 years	$$$

	implementation plan, Target 234, Action 4. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".			
	5% increase of number of identified endemic plant and animal species in the basin of Lake Baikal.	ESI	1-10 years	$$
	The bioresources monitoring plan in the basin of Lake Baikal has been developed and approved. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 234, Action 4. Action plan of Mongolian Government 2012-2016, Target 37, Action 3.	PI	1-5 years	$$
Strategic Action 13.2. Assessment of condition and forecast industrial use of fish resources and inventory of natural spawning ground condition. (Supplementary)	Regular assessments of resources are made and fish catch quotas, based on assessment results, are set. Mongolian co-financing: National Program on Protection of Round fish & its breeding, 3.2; Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 5.	PI	1-10 years	$$$
Strategic Action 13.3. Improvement of effectiveness of fish farming plants' work. (Supplementary)	Key spawning grounds have been restored.	SRI	1-10 years	$$$
	50% increase of young fish produced by fish farms. Mongolian co-financing: National Program on Protection of Round fish & its breeding, 3.1. Russia co-financing: State Program "Fisheries industry development". Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-10 years	$$$
Strategic Action 13.4. Enhance legal mechanisms of nature resource use in the Lake Baikal basin and improve efficiency of regulatory agencies and law enforcement in order to suppress poaching (Strategic)	10% reduction of number of violations of hunting, fishing, and conservation regulations related to living aquatic resources and their habitats. Mongolian co-financing: National Program on Protection of Round fish & its breeding, 3.1.1; National Program on Protection of rare & very rare animals. Russia co-financing: State Program "Fisheries industry development"; State program "Reproduction and use of nature resources".	SRI	1-10 years	$$$
Strategic Action 13.5. Provide legal support for traditional nature management of indigenous peoples with official legal status.	20% increase in the income of indigenous peoples within the Lake Baikal Basin. Mongolian co-financing: Mongolian Government Action Plan 2012-2016 and its implementation plan, Target 228, Action 1. Russia co-financing: State Program "Regional policy and federal relations".	SRI	1-10 years	$$

(Strategic)	10% increase in the number of people within indigenous groups which use their rights to traditional lands.	SRI	1-10 years	$

Strategic Component 4 indicators

Strategic Actions	Indicator	Indicator type	Timeframe	
Control and Prevention of Biological Invasions.				
Target 14. Existing biological invasions are under control and decreasing; future biological invasions are prevented. **Priority** - Very High.				
Strategic Action 14.1. Identification and organization of scientific research of causes, sources and living environment of all existing invasive species. (Strategic)	20% increase of number of research projects in the field of invasions research concerning the aquatic and terrestrial ecosystems of the Lake Baikal Basin. Mongolian co-financing: National Program on Protection of Biological Diversity.	ESI	1-5 years	$$$
Strategic Action 14.2. Conduct monitoring to track the extent of existing invasive species and detect new invasive species both in aquatic and terrestrial habitats. (Strategic)	Increase to 20% of number of monitoring studies which include indicators on invasions. Mongolian co-financing: National Program on Protection of Biological Diversity; National Program on Protection of Round fish & its breeding, 3.1; National Program on Protection of rare & very rare animals (2011-2021).	PI	1-5 years	$$$
	Increase to 20% of the Lake Baikal Basin, where monitoring is conducted, including science-based indicators that are unique to the lake ecosystem. Mongolian co-financing: Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 3. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-10 years	$$
	60% increase of Lake Baikal Basin, where monitoring is designed to identify mechanisms for the introduction of new invasive species. Mongolian co-financing: National Program on Protection of Biological Diversity; National Program on Protection of Round fish & its breeding, 3.2; National Program on Protection of rare & very rare animals (2011-2021). Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-5 years	$$

Strategic Action 14.3. Systematize information about the existing invasive species including their influence on local biodiversity and functioning of ecosystems in general. (Supplementary)	Expansion by 40% of the waters of Lake Baikal and Lake Khuvsgul and their coastal zones, covered by complex monitoring, including invasive species monitoring. Mongolian co-financing: National Program on Protection of Biological Diversity; National Program on Protection of Round fish & its breeding, 3.2. Russia co-financing: Federal Target Program "Lake Baikal Protection and socio-economic development of Baikal nature territory in 2012-2020".	PI	1-5 years	$$$
	Regional reports have been prepared on existing invasive species, which will contain up to date information about the impact of invasive species on local biodiversity and ecosystems. Mongolian co-financing: National Program on Protection of Biological Diversity.	PI	1-10 years	$
	50% increase in the number of invasive species for which reduction technologies have been developed (adopted) and are used. Mongolian co-financing: National Program on Protection of Biological Diversity.	PI	1-10 years	$$
	20% reduction in the area of the Lake Baikal Basin, where invasive species are spread. Mongolian co-financing: National Program on Protection of Biological Diversity; National Program on Protection of Round fish & its breeding, 3.2.	PI	1-10 years	$$
Strategic Action 14.4. Develop strategies to reduce the existing invasions and/or localize their habitat areas, including application of international experience. (Strategic)	50% increase in the number of invasive species which have technologies for their reduction or control and technologies which exclude a stimulating effect on the reproduction of existing invasive species. Mongolian co-financing: National Program on Protection of Biological Diversity; Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 5.	SRI	1-5 years	$$$
	20% increase in number of industries, including infrastructure, which have conducted studies to assess the stimulating effect on the reproduction of existing invasive species. Mongolian co-financing: National Program on Protection of Biological Diversity; National Program on Protection of Round fish & its breeding, 3.	PI	1-10 years	$$
Strategic Action 14.5. Support development of technologies which replace those that have the effect of stimulating the growth and	20% increase in the number of enterprises and organizations embedding technologies excluding the growth and reproduction of invasive species. Mongolian co-financing: National Program on Protection of Biological Diversity.	PI	1-10 years	$$$

reproduction of invasive species. (Supplementary)				
Strategic Action 14.6. Raise awareness of key stakeholders about potential after-effects of biological invasions. (Supplementary)	Interested businesses and individuals have been provided with information concerning invasive species in the Lake Baikal Basin. Mongolian co-financing: National Program on Protection of Biological Diversity; Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 5.	PI	1-5 years	$$
Strategic Action 14.7. Enhance legislation to prevent and control invasions. (Supplementary)	Regulations or laws have been adopted or modified as necessary, for the suppression of invasive species in the Lake Baikal Basin. Mongolian co-financing: National Program on Protection of Biological Diversity; Millennium Development Goals (MDGs)-based Comprehensive National Development Strategy of Mongolia. SIX. ENVIRONMENT. Strategic Target 5.	PI	1-5 years	$$
Strategic Action 14.8. Investigate mechanisms by which new invasive species may penetrate into the Baikal Basin. (Supplementary)	Establish the mechanisms in which new invasive species can penetrate into the basin of Lake Baikal. Mongolian co-financing: National Program on Protection of Biological Diversity; National Program on Protection of Round fish & its breeding, 3.	PI		$$$
	2-fold increase of the number of peer-reviewed publications on the topic of sources of invasions. Mongolian co-financing: National Program on Protection of Biological Diversity.	PI	1-10 years	$$

Strategic Component 5 indicators

Strategic Actions	Indicator	Indicator type	Timeframe	
Adaptation to Climate Change				
Target 15. Increased capabilities to monitor and adapt to climate change. **Priority** – High.				
Strategic Action 15.1. Assess ecosystem vulnerability and flexibility to climate change impacts in the lake Baikal Basin. (Strategic)	Recommendations of the Intergovernmental Panel on Climate Change, assessment of impact of climate change on the Lake Baikal basin ecosystem condition and functioning have been adopted. Mongolia co-financing: National Action Programme on Climate Change.	PI	1-5 years	$$$
	Quadrennial assessments of flexibility to climate change of most sensitive ecosystems of Lake Baikal Basin have been conducted. Mongolia co-financing: National Action Programme on Climate Change.	SRI	1-10 years	$$
	The plant and animal species most sensitive to climate change have been identified. Mongolia co-financing: National Action Programme on Climate Change.	PI	1-5 years	$$
	Models of impact of climate change on key species of plants and animals have been developed. Mongolia co-financing: National Action Programme on Climate Change.	PI	1-10 years	$$
	Development of the agreed Mongolian-Russian program of monitoring of negative climate impacts in the Lake Baikal basin and implementation of an early warning system of negative climate impacts. Mongolia co-financing: National Action Programme on Climate Change, First Phase, 1-2.1.	PI	1-5 years	$$
Strategic Action 15.2. Develop and implement strategies to increase ecosystem resilience and adaptation to climate change. (Supplementary)	Pilot projects have been implemented in terrestrial and aquatic ecosystems designed to increase the flexibility of ecosystems to climate change impacts. Mongolia co-financing: National Action Programme on Climate Change, First Phase, 1-2.1.	PI	1-5 years	$$$
	10% increase of share of territory developments projects, which should consider survival in conditions of climate change.	PI	1-5 years	$$
	Technologies have been evaluated for adaptation of agriculture to climate change and embedding of selected technologies in agriculture on the Mongolian part of the basin of Lake Baikal. Mongolia co-financing: National Action Programme on Climate Change, First Phase, 1-1.8.	PI	1-5 years	$$

	A guidance document has been developed and implemented on adaptive management for climate change in the Lake Baikal Basin.	PI	1-10 years	$
	Technologies have been introduced that support the adaptation of an ecosystem to climate change. Mongolia co-financing: National Action Programme on Climate Change, First Phase, 1-3.18.	PI	1-5 years	$$$
Strategic Action 15.3. Conduct breeding to enhance certain qualities of plants and animals which assist their adaptation to climate change. (Supplementary)	List of effectiveness of selection strategies to identify certain qualities of plants and animals to facilitate their adaptation to climate change has been prepared. Mongolia co-financing: National Action Programme on Climate Change.,First Phase, 1-3.18.	PI	1-5 years	$$
	Increase by 10% the number of breeding works aimed to produce climate resilient species of plants and animals. Mongolia co-financing: National Action Programme on Climate Change.,First Phase, 1-3.18.	PI	1-5 years	$$
Strategic Action 15.4. Conduct economic assessment of climate change impact on economic activities involving the use of biological resources. (Supplementary)	An assessment of the impact and economic losses from climate change has been conducted. Mongolia co-financing: National Action Programme on Climate Change.,First Phase, 1-4.15.	PI	1-5 years	$$$
	Technologies have been introduced that support the adaptation of economic sectors to climate change. Mongolia co-financing: National Action Programme on Climate Change.,First Phase, 1-4.15.	PI	1-5 years	$$$
Strategic Action 15.5. Support climate change mitigation through increased investments in environmentally friendly alternatives. (Strategic)	Increase by 10% investments in projects and technologies, which can reduce greenhouse gas emissions. Mongolia co-financing: National Environmental Action Plan of Mongolia, 2012-2021, 9-6; National Action Programme on Climate Change.,First Phase, 1	PI	1-10 years	$$$

Strategic Component 6 indicators

Strategic Actions	Indicator	Indicator type	Timeframe	
Preparation for Natural Disasters				
Target 16. Enhancement of forecasting, warning and responding to natural disasters (fires, floods, droughts, hurricanes, mudslides, earthquakes, dzud and so on) and epizootics. **Priority** – High.				
Strategic Action 16.1. Enhance methods of forecasting and modelling; and develop a system of training for specialists in seasonal weather forecasting and prediction of river run-off. (Supplementary)	New methods have been developed and implemented for modeling of seasonal weather forecasts and river flows. Mongolia co-financing: National Action Programme on Climate Change, Mongolia, First Phase, 1.	PI	1-5 years	$$$
	50% increase in the number of trained professionals for seasonal weather forecasts and river flow predictions. Mongolia co-financing: National Action Programme on Climate Change, Mongolia, First Phase, 1 Russia co-financing: State program "Environment protection".	PI	1-5 years	$$
	10% increase of emergency forecast verification. Mongolia co-financing: National Action Programme on Climate Change, Mongolia, First Phase, 1 Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety".	PI	1-5 years	$$$
	A super-computer network has been created with a maximum load capacity of 50 teraflops, and simulation systems and training for seasonal weather forecasts and river flow in the Mongolian part of the Baikal area. Mongolia co-financing: National Action Programme on Climate Change, Mongolia, First Phase, 1	PI	1-5 years	$$$
Strategic Action 16.2. Develop and implement risk reduction systems for natural disasters at the national and transboundary levels to prevent or reduce impacts of natural disasters. (Supplementary)	2-fold increase of the total area of buildings and structures, with enhanced earthquake resistance. Mongolia co-financing:: National action programme on developing capcity preventing natural disasters; National action program on Climate Change, Mongolia first phase 1-2.1. Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety".	PI	1-10 years	$$$
	Develop a system of disaster risk reduction at national and transboundary levels to prevent or mitigate the impacts of natural disasters.	PI	1-10 years	$$$

Strategic Action 16.3. Implement joint assessments and management of ecosystem services; and organize streaming information for forecasting, warning and responding to natural disaster challenges. (Supplementary)	An early warning system has been established for forecasting hydrometeorological disaster events, including exchange of information and analytical data between Russian and Mongolian services. Mongolia co-financing: National Action Programme on Climate Change, Mongolia, First Phase, 1-2.1	PI	1-5 years	$$
Strategic Action 16.4. Enhance the disaster response system when natural disasters occur. (Strategic)	Fire department and law enforcement agencies have been trained in emergency response to natural disasters.	SRI	1-5 years	$$
Strategic Action 16.5. Develop improved transboundary preventive and warning system for the protection of wildfires and flooding. (Supplementary)	A transboundary system for prevention and joint actions to protect against forest fires and floods has been developed.	PI	1-5 years	$$$
	Increase to 10% of population covered by transboundary warning systems to protect against forest fires and floods. Russia co-financing: Federal Target Program "Civil and territory protection in emergency situations, ensuring of fire safety and water safety"; Federal Target Program "Development of water industry of the Russian Federation for 2012-2020".	PI	1-5 years	$$$
Strategic Action 16.6. Enhance resilience to climatic disasters through adoption of groundwater emergency plans for more vulnerable and densely populated areas. (Strategic)	Evaluations have been conducted to determine the amount of groundwater (m^3) which can be secured for emergency supplies in response to drought conditions.	SRI	1-5 years	$$
	Evaluations have been conducted to determine the amount of flood-resistant groundwater identified (m^3) in response to flooding.	SRI	1-5 years	$$
	Evaluations have been conducted to determine the amount of flood-resistant groundwater for emergency drinking water supply secured.	SRI	1-5 years.	$$
Strategic Action 16.7. Work toward eradication of epidemic and epizootic outbreaks. (Supplementary)	Decrease to 80% Epidemic and epizootic outbreaks.	PI	1-10 years	$$$

Annex II TDA

http://baikal.iwlearn.org/en/project/tda

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