

ARMENIA  
Natural Resources Management and Poverty Reduction Project

## Project Appraisal Document

Europe and Central Asia Region

ECSSD

<b>Date:</b> January 31, 2002 <b>Country Manager/Director:</b> Judy M. O'Connor <b>Project ID:</b> P057847 <b>Lending Instrument:</b> Specific Investment Loan (SIL)	<b>Team Leader:</b> Adriana Jordanova Damianova <b>Sector Manager/Director:</b> Laura Tuck <b>Sector(s):</b> VM - Natural Resources Management <b>Theme(s):</b> Environment <b>Poverty Targeted Intervention:</b> Y							
<b>Global Supplemental ID:</b> P069917 <b>Focal Area:</b> B - Biodiversity <b>Supplement Fully Blended?</b> No	<b>Team Leader:</b> Adriana Jordanova Damianova <b>Sector Manager/Director:</b> Laura Tuck <b>Sector(s):</b> VM - Natural Resources Management							
<b>Project Financing Data</b>								
<input type="checkbox"/> Loan <input checked="" type="checkbox"/> Credit <input type="checkbox"/> Grant <input type="checkbox"/> Guarantee <input type="checkbox"/> Other:								
<b>For Loans/Credits/Others:</b> <b>Amount (US\$m):</b> IDA Credit US\$8.3 equivalent; GEF Grant US\$5.1								
<b>Proposed Terms (IDA):</b> Standard Credit								
<b>Grace period (years):</b> 10 <b>Years to maturity:</b> 40 <b>Commitment fee:</b> 0.50% <b>Service charge:</b> 0.75%								
<b>Financing Plan (US\$m):</b> <b>Source</b> <b>Local</b> <b>Foreign</b> <b>Total</b>								
BORROWER	1.40	0.12	1.51					
IDA	5.82	2.48	8.31					
SWEDEN: SWEDISH INTL. DEV. COOPERATION AGENCY (SIDA)	0.28	0.78	1.06					
GLOBAL ENVIRONMENT FACILITY	2.72	2.40	5.12					
<b>Total:</b>	10.22	5.78	16.00					
<b>Borrower/Recipient:</b> REPUBLIC OF ARMENIA <b>Responsible agency:</b> MINISTRY OF NATURE PROTECTION Address: 35,Moskovian Str., Yerevan <b>Contact Person:</b> Mr. Vardan Ayvazyan, Minister of Nature Protection Gohar Chazynian, PIU Director, Ministry of Nature Protection Tel: 374-1-521099                      Fax: 374-1-531861                      Email: NRMPRP@netsys.am								
<b>P057847 Estimated Disbursements ( Bank FY/US\$m):</b>								
<b>FY</b>	2003	2004	2005	2006	2007	2008		
<b>Annual</b>	1.00	2.70	4.40	3.10	1.70	0.50		
<b>Cumulative</b>	1.00	3.70	8.10	11.20	12.90	13.40		
<b>P069917 (GEF) Estimated Disbursements ( Bank FY/US\$m):</b>								
<b>FY</b>	2003	2004	2005	2006	2007	2008		
<b>Annual</b>	0.75	1.00	1.25	1.00	0.70	0.42		
<b>Cumulative</b>	0.75	1.75	3.00	4.00	4.70	5.12		
<b>Project implementation period:</b> 6 years <b>Expected effectiveness date:</b> 07/31/2002 <b>Expected closing date:</b> 07/31/2008								

## **A. Project Development Objective**

### **1. Project development objective: (see Annex 1)**

*Development objective.* The project's development objective is adoption of sustainable natural resource management practices and alleviation of rural poverty in mountainous areas of Armenia where degradation of natural resources is now reaching a critical point. The project will help avert further deterioration of natural resources (soil, water, forest, fishery, and biodiversity) and stabilize incomes in the local communities.

#### *Project Background*

Armenia is a mountainous country with a territory of 29,000 sq. km, and a population of 3,740,000 people. More than 50% of the population is rural and living in poverty. Only 28% of the land area is below 1,500 m elevation with an annual precipitation in the lower bound of 330-600 mm. The mountain ecosystems of Armenia are a productive asset that produces a valuable flow of goods and services of local and global significance. Unsustainable exploitation of natural resources is eroding the asset's productivity. The project area include a variety of mountain, forest, meadows, aquatic and steppe ecosystem, which host a significant share of country's biodiversity resources. Forests in the project area have a significant role in fauna conservation and creation of the transboundary wildlife corridor between Armenia and Georgia. Two main protected areas in the geographic area of the project are the Sevan National Park (1,500 sq.km) and Dilijan State Preserve (280 sq.km). In addition the area is rich for its cultural heritage amenities, which together forms a unique ecosystem which has significant potential for developing eco and natural heritage tourism. The proposed project is a long term investment for sustainable management of the country's natural resources.

Natural landscapes in the project area are managed by the following Government institutions: state forests are managed by Forest Administration (Hyantar) and protected areas are managed by the Department of Bioresources and Land Protection under the Ministry of Nature Protection (MONP); and Village Councils (Haymanks) have legal responsibility for community pastures whilst overseeing management of privately held land within the village area. Since the end of Soviet times, the landscapes have not been managed in a planned or coordinated way. As a result of this, and the economic hardship experienced during the past decade, the natural resource assets of Gegharkunik and Tavoush marza are degrading.

### **2. Global objective: (see Annex 1)**

*Global environmental objective.* The global environmental objective of the proposed project is to preserve the mountain, forest, and grassland ecosystems of the Southern Caucasus, through enhanced protected area and mountain ecosystem conservation and sustainable management.

### **3. Key performance indicators: (see Annex 1)**

Performance indicators measuring progress towards achieving the project development objective agreed during pre-appraisal *inter alia* include:

- (a) increase in income (or expenditure) in project villages compared to non-project villages;
- (b) increased crop and livestock productivity in project villages compared to non-project villages;
- (c) increased community participation in natural resources management decisions, as perceived by stakeholders in target communities;
- (d) reduced illegal activities destroying forest cover;

- (e) reversal of degradation in pasture vegetation cover; and
- (f) increased quality, quantity and productivity of forest cover in the project area;

Performance indicators measuring progress toward achievement of project global environmental objectives will be monitored according to the *Guidelines for Monitoring and Evaluation of GEF Projects*. This would include:

- (a) development of protected areas management plans for Lake Sevan National Park and Dilijan Nature Reserve- supported by local communities, adopted by Government, implemented in year two, and made subject to annual review; and
- (b) stable or increasing numbers of key indicator species according to population censuses taken in two of the last four years of the project.

## **B. Strategic Context**

### **1. Sector-related Country Assistance Strategy (CAS) goal supported by the project: (see Annex 1)**

**Document number:** 16899-AM **Date of latest CAS discussion:** 07/31/1997

The project would further the CAS objectives of supporting social sustainability and poverty alleviation and mitigating environmental degradation, the latter one of the key medium-term risks to sustainability of economic growth identified in the CAS (dated July 31, 1997, No. 16899-AM). A new CAS consistent with Government's Interim Poverty Reduction Strategy Paper (I-PRSP) is currently under discussion between IDA and the Government of Armenia. Like the 1997 CAS, the I-PRSP emphasizes protection of environment and regeneration of natural resources as a basis for sustaining local economies and reducing rural poverty.

#### **1a. Global Operational strategy/Program objective addressed by the project:**

**GEF Operation Program Objective.** The project is consistent with GEF objectives in the Biodiversity focal area – specifically, GEF Operational Program #3 “Forest Ecosystems,” and GEF Operational Program #4, “Mountain Ecosystems” – and also with GEF Operational Program #12, “Integrated Ecosystems Management.” The protected area sites on which the project focuses are regionally significant for protection of biodiversity corridors in Southern Caucasus area. Outside the protected areas, the project supports conservation and sustainable use of biodiversity by improving mountain forest and grassland management through involvement of local communities who depend upon them for their livelihood. Beyond Armenia, the project’s proposed re-vegetation measures may mitigate anthropogenic releases of carbon dioxide. As a whole, the project is responsive to COP III guidance in that it promotes capacity building promotes conservation and sustainable use of natural resources through adaptive management of forest landscapes, and supports the objectives of other international conventions.

Armenia ratified the Convention on Biological Diversity (CBD) in May 1993. Recognizing the importance of contributing to the international effort to mitigate greenhouse gas emissions, Armenia also ratified the UN Framework Convention on Climate Change (UN FCCC) in May 1993. In order to fulfill the basic provisions of these conventions, Armenia has committed to contribute to international objectives by developing two national projects (i) First National Report to CBD and Biodiversity Strategy and Action Plan, and (ii) Country Study on Climate Change, which were funded by GEF. As a result, Armenia has identified at national and regional levels, natural ecosystems and spheres of activity which are most vulnerable to climate changes effects and ecological consequences that need to be addressed through practical actions. The proposed project is directly linked to the efforts of the Government of Armenia to address national and global priorities by reversing land degradation, improving carbon sequestration and enhancing biodiversity.

## **2. Main sector issues and Government strategy:**

*Rural poverty.* Since the dissolution of the former Soviet Union, Armenia has suffered a number of serious setbacks that have led to the impoverishment of many rural communities, especially in the remote mountain and border areas. The withdrawal of Soviet subsidies and markets has destroyed industries that once provided employment and declining public spending have led to the deterioration of rural infrastructure. At present, some 55% of the Armenian population is classified as poor. Rural poverty is particularly evident among those living in high altitude mountain areas such as Tavoush and Gegharkunik. The primary activity of approximately 70 percent of rural households in the project area is subsistence farming with small amounts of agricultural surplus bartered in local markets. Remittances, pensions and day labor provide cash. The rural economy has provided a "safety net" during the crisis years and absorbed a significant share of Armenia’s excess labor, as rural communities have been able to buffer themselves somewhat through their access to natural resources. The majority of farmers are cash constrained and are unable to invest in their land and pasture, which leads to slow mining of renewable natural resources. By the same token, rural people have had little choice but to exploit the natural resource base for survival. For example, timber and non-timber products in Dilijan State Reserve are illegally harvested, as are fish of Lake Sevan. Over time, this “mining” of natural resources has led to severe degradation of forests, fish stocks, pastures and soil, with consequent loss of habitat and decline in indigenous flora and fauna.

*Declining soil fertility and degradation of pastures.* Since the transition land that is near villages, where cost of access is lower, has been farmed more intensively, while remote land is left idle. More intensive farming of land near villages has led to reduced application of crop rotation techniques, leading to declining soil fertility and nutrient mining, while use of production inputs that could protect the soil from exhaustion remains sub-optimally low. At the same time, inappropriate farming techniques, especially on slope lands, have increased soil erosion. It has been estimated that more than 60% of Armenia’s arable land now needs

improved soil management.

Grazing patterns, like crop production patterns, have undergone a fundamental shift since the economic transition began. Small average household livestock numbers, collapse of organized grazing arrangements, high costs of accessing more distant pastures, and limited availability of labor have led to increased use of pastures located around villages. These areas have become subject to heavy pressure from overgrazing, even while more-remote summer pastures and Alpine meadows remain under utilized. Pressure on village pastures is further increased by the shortened pen-feeding periods that are increasingly farmers' practice as winter fodder and farm by-products become relatively more expensive. In a further turn of the vicious cycle, declining livestock productivity has pushed households to generate income through increasing their livestock numbers, which have added further pressures on pastures. Most community pastures are now overgrazed, subject to various forms of degradation that range from change in vegetative cover to generation of erosion centers, leading in turn to landslides and mudflows.

*Degradation of forests.* The rising cost to Armenians of other fossil fuel sources has increased reliance on wood as a source of heating and cooking fuel, in both rural and urban areas. The demand for wood, including both fuel wood and also the timber illegally harvested, now seriously exceeds the sustainable cut, resulting in significant loss of forest cover from year to year. Overgrazing in forest areas contributes to loss of forest cover. For all these reasons, forest cover has diminished 10% over the last ten years. Moreover, as a result of overlogging, soil erosion has increased in the mountain areas, contributing to increased siltation of irrigation structures and surface waters. An inadequate legal and policy framework for forest stewardship exacerbates these problems, and sustainable management of forests is limited by the weak capacity of the Forest Administration (Hayantar) to implement or enforce sustainable forest management practices.

*Weakness of protected areas network.* Armenia has a network of protected areas. However, the network is geographically fragmented. In a number of cases, park boundaries omit areas of high biodiversity value that are just beyond the boundary, while including large-scale farming areas and high-intensity tourism sites. In addition, the reserve, recreation and economic zones are far too broadly defined.

In addition, management effectiveness is very low. The various environmental and conservation laws, decrees and regulations developed over the past decade do not provide a clear and effective enabling environment for protected areas management, and the protected areas generally operate as "paper parks." Management of natural resources within both protected areas is largely restricted to minor enforcement of laws and regulations. Monitoring systems are not well developed. Communication and transport equipment required for even a minimal level of management and enforcement is lacking. Infrastructure development and maintenance is nonexistent due to financial constraints. Outdated materials and the poor condition of visitors' centers hamper public awareness and education programs. Scientific studies within protected areas have been very limited in the past decade and are not well integrated into protected management decisions. Planning for biodiversity conservation in protected areas is constrained by weak financial, human and technical capacity, and does not employ participatory management planning or make a primary goal of maintaining ecological integrity. Local people are largely unaware of the protected areas system values it protects, while the resource managers often view communities in the vicinity as enemies rather than potential partners in biodiversity conservation.

*Global importance of Armenia's biodiversity.* Besides being of vital importance to those whose subsistence depends on them, the habitats and ecosystems under threat have global biodiversity significance. Armenia is located in the Caucasus Eco-Region, one of the Global 200 Eco-Regions, at the crossroads of three biogeographic zones, the European, Central Asian, and Middle Eastern. This

eco-region includes unusually rich flora, fauna and natural landscapes and ecosystems. Armenian habitats contain nearly every plant community found in the southern Caucasus and 50% of the region's floral diversity; a great variety of landscape zoning and climatic conditions in Armenia has resulted in the generation of plant forms in diversity centers independent of each other. These species are notable for their productivity and their resilience to unfavorable conditions, diseases, and pests; they constitute a significant basis for conservation of agro-biodiversity.

However, biodiversity is threatened by natural resource mining. Increasing pressures on critical rangelands and forest habitats have reduced to isolated areas of globally significant biodiversity, making the movement of wildlife increasingly difficult. Even within protected areas such Dilijan State Reserve, for example, many demarcated "protected" areas are becoming small islands rather than part of a larger mosaic of protected ecosystems inside and outside park boundaries.

Under-use of remote cropland and pasture also threatens agro-biodiversity, which depends on interaction with agricultural activities such as grazing and mowing. Due to the difficulty of access to them, many meadows are no longer used and may lose their global ecological value.

Rich forest biodiversity is subject to heavy pressure as well. Illegal logging often completely removes dominant trees and species, resulting in the loss of wildlife habitats in the forest ecosystem. In the legal sector, the historic forestry orientation of Armenia's resource managers means that they tend to support stand-level interventions, such as removal of over-mature trees and deadfall in accessible forest areas. In contrast to this, broader ecosystem management would allow some areas in different forest cover types to follow natural cycles, providing ecological and socio-economic benefits other than simply maximizing sustainable timber yields.

As for Armenia's fauna, about 330 of the 17,500 species found in Armenia are listed as rare or declining. The Armenian Red Book lists 99 vertebrates, among which are many considered internationally threatened by the IUCN.

#### *Government Strategy*

The following reform policies are relevant to the successful implementation of project interventions:

*Reduce rural poverty.* The immediate development goals of the GOA include mitigation of the social impact of the transition on the poor, and the Interim Poverty Reduction Strategy Paper (I-PRSP) identifies conservation and improved management of natural resources as one of Armenia's priorities in attacking poverty.

*Reverse declining soil fertility and degradation of pastures.* To reverse the spiral of poverty and natural resource degradation, the Government has initiatives underway to make agriculture more profitable and meanwhile to increase the incentives for good management of natural resources. The Government's strategy in agriculture includes further liberalization of the agriculture sector, support for the development of agricultural support services, and halting the deterioration of basic agricultural infrastructure. The Government is also committed to land-use policy reform and establishment of a functioning land market. Steps have been taken to establish a legal framework for land registration and titling. Land ownership is expected to increase incentives for sustainable land management. In the meantime, the Government has been granting short-term leases of state pasture lands to local households and communities. The Government has recognized, however, that these short-term leases have had a negative impact on the lands involved. In order to address the disincentive for sustainable management that is inherent in such leases, the new Land Code (adopted in 2000) sets up the legal framework for long-term lease arrangements. The

Government plans to undertake transfer of pastures to local communities on a long-term basis.

*Restore forests.* The GOA intends to declare the 21st century the century of Armenia's reforestation. It has initiated a process of reform in the forestry sector that aims to rationalize the functions of different state institutions, resolve overlapping responsibilities, and update the professional knowledge and skills of foresters. The Government has made attempts to increase the flow of revenue from utilization of state forests in order to generate the budget resources needed for forest management activities. To that end, it has set out to improve collection of taxes and social fees among citizens and enterprises and to better control black market activities in the forest sector. At the same time, public awareness of forestry issues needs to be raised, and the Government intends to re-institute community forests and facilitate local participation in forest management in rural areas.

*Conserve biodiversity and strengthen protected areas network.* Armenia ratified the Convention on Biological Diversity (CBD) in May 1993. Recognizing the importance of contributing to the international effort to mitigate greenhouse gas emissions, Armenia also ratified the UN Framework Convention on Climate Change (UNFCCC) in May 1993. In order to fulfill the basic provisions of these conventions, Armenia has committed to contribute to international objectives by developing two national projects (i) First National Report to CBD and Biodiversity Strategy and Action Plan (BSAP), and (ii) Country Study on Climate Change, which were funded by GEF. As a result, Armenia has identified at national and regional levels, natural ecosystems and spheres of activity that are most vulnerable to climate change effects and ecological consequences that need to be addressed through practical actions.

Armenia's strategy for biodiversity conservation, as identified in its National Environmental Action Plan (1999) and BSAP focuses on sustainable development of landscapes, building human capital and increasing financial investments to achieve improvements in four key areas: (i) institutional and community activities in sustainable development and the legal framework that would enable it; (ii) public awareness and participation; (iii) protected area network planning and management; and (iv) safeguarding of flora and fauna through mainstreaming of biodiversity conservation in agriculture, forestry and other sectors.

Armenia has ratified a number of international agreements and conventions relating to the protection of biodiversity, although implementation is not consistently sustained:

- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention, 1971). Armenia ratified the Ramsar Convention in 1993.
- Convention on Biological Diversity (UNCBD, Rio de Janeiro, 1992). This convention was ratified by Armenia in 1993, and the first stage of implementation has included development of a National Biodiversity Strategy and Action Plan, and the first National Report (Country Study of Biodiversity) to meet reporting requirements to the COP.
- Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention, Paris, 1972). This convention was ratified in 1993.
- Convention to Combat Desertification (UNCCD, Paris, 1994). The UNCCD was ratified by Armenia in 1997.
- Framework Convention on Climate Change (UNFCCC, Rio de Janeiro, 1992). The UNFCCC was ratified by Armenia in 1993, and production of a Country Study on Climate Change is underway.

The Government has established a National Steering Committee for the implementation of the BSAP. The Committee will form one avenue for mainstreaming biodiversity conservation into central and other line Ministries. The Committee comprises the Minister of environment (chairman), Deputy Minister, head of International Relations Department, head of Department of Fauna and Flora, the CBD focal point,

representatives of the Ministries of Agriculture, Education, Economy and Finance, Industry, Trade, and Tourism; representatives of the National Academy of Sciences, NGOs, UNDP, and the World Bank.

### **3. Sector issues to be addressed by the project and strategic choices:**

The project addresses *rural poverty* both through the creation of temporary jobs in the short term and also through increased agricultural productivity and improved management of natural resource base in the long term. Temporary jobs will be available in community implementation of project interventions in watershed management and forestry; meanwhile, the project will facilitate the transfer of use rights for pastures and some forests to communities on a long-term basis. Agricultural and livestock productivity is then expected to rise, first, as a consequence of the watershed management interventions for improved pasture and forest productivity; and second, as a consequence of the reduced pressure on natural resources following the spike in employment opportunities.

The project addresses *forest degradation* by supporting the Government's initiatives to improve forest management, protection, and regeneration; raise the productivity of existing stands; transfer management responsibility for certain forests to local communities; improve institutional capacity; and rehabilitate infrastructure. These activities are expected to create a large number of temporary jobs in the project area, which will contribute to the rural poverty alleviation objective of the project.

The project addresses *biodiversity degradation* by developing and implementing participatory protected area management plans, strengthening institutional capacity, rehabilitating protected area infrastructure, restoring natural ecosystems, and encouraging trans-boundary cooperation. It also supports biodiversity in the production landscape by increasing species composition in rangeland and forest protection. Small grants designed to stimulate sustainable resource use will help alleviate poverty.

There is considerable experience worldwide on demand driven development projects promoting sustainable agriculture, increased productivity and environmentally responsible natural resource use. Watershed rehabilitation projects focusing on poverty and natural resources protection in Turkey, China, Panama, Brazil-Parana Province have been successful in providing short and long term socioeconomic and environmental benefits.

#### Strategic Choices

The Government selected the two marzes that comprise the project area, Tavoush and Gegharkunik, in light of several considerations. The incidence of rural poverty is very high in both areas. At the same time, these marzes include a variety of mountain, forest, meadow and steppe ecosystems and host a significant share of the country's biodiversity resources. Forests in these districts have a significant role in fauna conservation and creation of the transboundary wildlife corridor between Armenia and Georgia. Tavoush contains the largest share of the remaining forest resources in the country, although its resources are under severe pressure from illegal harvesting, while Gegharkunik contains the largest water basin in Armenia, Lake Sevan, which has high economic, environmental and cultural heritage values. The protected area sites on which the project focuses, Lake Sevan National Park and Dilijan State Preserve, were identified as national priorities in Armenia's Biodiversity Strategy and Action Plan (1998) and its National Environmental Action Plan (1999). Lake Sevan National Park harbors unique alpine lake ecosystem and littoral habitats. Dilijan State Preserve is a unique forest ecosystem that hosts 900 species, some of them endangered species in the southern Caucasus, which are dependent on broad-leaved forests for their existence. Conservation of the mountain broad-leaved forest and natural grassland ecosystems outside the protected areas, through the reforestation, re-vegetation and improved management activities projected for this project, would protect critical transboundary wildlife corridors between Armenia and Georgia, as well



as corridors between the protected areas.

If the project is successful, its experience will lead to wider adoption of sustainable resources management in Armenia.

*Community participation:* Transfer of resources user rights to communities is the means selected to create incentives to encourage communities to adopt environmentally sound practices. Increased accountability, together with investments to strengthen community capacity to undertake natural resources planning, is expected to improve management of the natural resource base as well as produce a sustainable flow of goods and services for the people living there. By the same token, community participation in decision making and implementation will make adoption of environmentally responsible practices more sustainable.

## **C. Project Description Summary**

**1. Project components** (see Annex 2 for a detailed description and Annex 3 for a detailed cost breakdown):

### *1a. Description of project areas.*

Project intervention will focus on Gegharkunik and Tavoush marzes located in Northern part of Armenia. The area of Gegharkunik marza is 4,055 sq.km, out of which Lake Sevan National Park consists of 1,500 sq. km. The altitude range in the marza is 2,000 to 3,500 m, and total population is 277,000 thousand (175,000 rural, which is 84% of total). It is estimated that extreme poverty in the area ranges from 30% to 70% depending on location. The area of Tavoush marza is 2,688 sq.km, with total population of 156,000 (98,000 rural which is 79% of total), of which Dilijan State Preserve consists 290 sq. km. Total area covered with forests in Tavoush is 131,800 ha. Altitude range in the marza is 400 to 2,800 m. Poverty is high among the 62 communities, where extreme poverty ranges from 30% to 70% depending on location.

The GOA has identified these two marzes as priority sites where project approaches will be piloted. Tavoush marza has the largest share of forest resources of any district in the country. Gegharkunik marza is selected because of strategic location of the Lake Sevan, which is the largest water basin in Armenia that has high economic, environmental and cultural heritage values. Both marzes have above national average rural poverty levels (51%, 72% and 65% for Armenia, Tavoush and Gegharkunik respectively).

*1.b Project Components:* The project will include four components: 1. Community-based Watershed Management; 2. State Forest Management; 3. Protected Areas Management and Biodiversity Conservation; and 4. Project Management and Administration. Annex 2 provides detailed description of project activities.

### **Component 1. Community-Based Watershed Management ( IDAUS\$4.9m, GEF US\$0.9m )**

This component will focus on Gegharkunik and Tavoush marzes located in northern Armenia (see Map). At the outset, it will focus on selected micro-catchments in eight watersheds. Watersheds identified during project preparation are as following: Gegharkunik marza: Maipor Getik, Antaramedj (Tchambarak), Dzoragyugh-Tzakkar and Gavar; Tavoush marza: Gosh (Ijevan), Polad Getik, Koghb (Noyemberyan), Hakum. However, identification and selection of additional watersheds will start during the second year of project implementation, based on agreed selection criteria. During the life of the project watershed rehabilitation activities will be undertaken on 40 watersheds. Estimated duration for micro-catchment planning is one year and for implementation two to three years.

The component would support preparation and implementation of community based micro-catchment rehabilitation plans. The plans will be generated by the community selecting from a menu of activities developed by the project (presented below). Participating communities will be eligible to apply for small grants to support small-scale local initiatives related to biodiversity conservation.

The menu of options from which communities will choose is as follows:

**1.1: *Community forest management.*** Support will be provided for preparation and implementation of community forest management plans including: rehabilitation and enriching of forests (under planting), reforestation and afforestation, thinning and tending, rehabilitation of forest pastures, demonstrations of sustainable pig-beech-oak silvo-pastoral agro-forestry; and demonstrations of bio-gas production installations.

**1.2: *Community small-grants for biodiversity conservation.*** Participating communities will be eligible for financial assistance (maximum \$5,000) to support local initiatives which benefit biodiversity conservation either directly or indirectly by supporting local livelihoods and reduce pressure on the protected areas and biological resources.

**1.3: *Community pasture management.*** This activity will undertake improvement of the management of natural grasslands and hay meadows in the project area, including rehabilitation of hay meadows, indigenous reseeded, rotational grazing and restoration of degraded pasturelands, construction of livestock watering points and re-introduction of forage legumes into crop rotations.

**1.4: *Sustainable agricultural practices.*** Financing will be provided for demonstration cultivation of improved variety of rainfed barley and wheat, improved soil fertility and improved methods of animal husbandry, and bee-keeping. The project will assist communities participating in the IFAD-supported irrigation project or the USDA agricultural-marketing project.

**1.5: *Community infrastructure and income generation.*** The project would also support small water-collection systems for irrigation, restoration of field tracks and culverts, road network rehabilitation for management and protection of community forests, and measures to control land slides and gully erosion. In collaboration with IFAD, the project would support improvement of small-scale on-farm irrigation systems. Other opportunities will be identified during implementation.

**1.6: *Development of Community Institutions.*** Logistical support will be provided to village councils, marza-level organizations and Village Resource Management Associations to develop capacity to implement and monitor watershed and community forest plans.

The project would finance small works, equipment, work hire and materials (e.g., seeds, tree seedlings, inputs, and fertilizers) and technical assistance (resources planning, training, outreach and awareness, and demonstrations). Communities are expected to contribute their labor. GEF funds would finance technical assistance for measures to conserve forest biodiversity and to co-finance the costs of recovery of alpine meadows and steppes, including re-seeding with indigenous grass species, native wild fruit trees and non-wood forest products.

**Component 2: State Forest Management** (IDA US\$2.8 million, GEF \$0.17 million). It will support rehabilitation, protection and sustainable management of state forests in the project area; improve the forest sector's institutional, legal and policy framework; and enhance institutional capacity to monitor and control

forest operations.

**2.1: *Demonstrate improved forest management practices.*** (IDA US\$2.48 million) This sub-component will undertake: (i) preparation of modern multipurpose state forest management plans in state forests; (ii) pre-commercial thinning and thinning of pole stands in naturally regenerated forests; (iii) measures for regeneration of over-mature, partially disintegrating stands by applying group selection felling and low-impact harvesting methods; (iv) reforestation of overlogged stands and afforestation of blanks in forests; (v) protection of forests against fires and insects; (vi) rehabilitation of road network for implementation of the approved forest management plans and for efficient forest protection; (vi) measures for strengthening the operational capacity of the forest service (Hayantar) and its local branches as well as to rehabilitate its offices and equipment.

**2.2: *Strengthen legal and institutional framework and increase human resources capacity*** for sustainable forest management and biodiversity conservation. (IDA US\$0.35 million; GEF US\$0.17 million; parallel financing from SIDA US\$1.0 million). This component will increase national and local capacity for implementation of sustainable forest management programs. I would support: (i) review and improvement of forest-related legislation; (ii) improved marketing and pricing of forest products, including initiatives to reduce illegal logging and to undertake forest certification; (iii) organizational reform of Hyantar; (iv) development and execution of training programs for staff of Hyantar, protected areas, extension and inspection services; (v) establishment of a national forest and biodiversity training center in Zikatar.

SIDA will provide technical assistance for studies, training and capacity building. GEF funds will be used for training and awareness activities, mainstreaming of biodiversity-conservation issues into national forest laws, and development of regulations and forest management plans.

**Component 3: Protected Areas Management and Biodiversity Conservation (GEF US\$3.48 million).** This component will support measures to: (i) improve the role of two key protected areas (Lake Sevan National Park and Dilijan State Reserve) in the conservation and sustainable use of the region's biodiversity, and sustain these improvements; (ii) improve the capacity of the Department of Bio-resources and Land Protection of the MoNP to meet its biodiversity conservation mandate inside and outside protected areas – including mainstreaming of biodiversity in government policies and laws as well as activities of the line ministries and marza governments.

**3.1: *Improve the management of Dilijan State Reserve and Lake Sevan National Park.*** This sub-component will support preparation and implementation of new management plans for Lake Sevan National Park and Dilijan State Reserve. The management plans will review the boundaries of these protected areas and propose more effective boundaries and zoning based on scientific knowledge and updated baseline inventory and maps. The planning process will take the view that protected area management plans are tools to address a wide variety of demands and values (biodiversity, human, cultural, socioeconomic) with a primary goal of conserving globally and nationally important biodiversity. In the case of Dilijan State Preserve, the management plan will be input for the decision of the Government of Armenia concerning the Preserve's proposed change in status. The planning process will acknowledge that protected areas management plans are tools to address a wide variety of demands and values (biodiversity, human, cultural and socio-economic) while acknowledging the primary goal of conserving globally and nationally important biodiversity. Specific activities under this component will include: (i) preparing participatory protected area management plans; (ii) developing monitoring systems and undertaking applied studies in support of improved management; (iii) providing professional development and training for protected-areas staff and local stakeholders; (iv) delivering environmental education and public community

programs to build local awareness of the protected area's multiple objectives and encourage participation of local communities; (v) establishing park infrastructure and logistical support at Dilijan State Reserve and Lake Sevan National Park.

**3.2: Build capacity in the MoNP to administer the system of protected areas, and build public awareness of biodiversity conservation.** Specific activities under this sub-component will include:

(i) reform of key legislation and regulations concerning conservation of flora and fauna of protected areas to strengthen the role of MoNP in protected areas management and create effective mechanism for revenue retention; (ii) mainstreaming biodiversity conservation into the planning and policy processes of central and sectoral ministries; (iii) strengthening information dissemination; (iv) rapid assessment for biodiversity conservation at the landscape level by establishing PC based GIS for integrated resource management and mapping; (vi) strengthening of transboundary cooperation in biodiversity monitoring and protected-areas management.

**Component 4: Project Management and Administration.** (IDA US\$0.5 million, GEF US\$0.5 million).

This component will support project administration and implementation. The project will finance the incremental operational costs of the project management team, essential technical assistance for project management (e.g., financial management and procurement training, project audit, institutional coordination, implementation assistance to communities and public sector training for capacity building, basic equipment and facilities, and 85 % of the operating costs of the PIU).

Component	Sector	Indicative Costs (US\$M)	% of Total	Bank financing (US\$M)	% of Total	GEF financing (US\$M)	% GEF financing
1. Community Based Watershed Management	Natural Resources Management	6.40	40.0	4.96	59.8	0.94	18.4
2. State Forest Management	Natural Resources Management	4.77	29.8	2.83	34.1	0.17	3.3
3. Protected Areas Management and Biodiversity Conservation	Natural Resources Management	3.67	22.9	0.00	0.0	3.50	68.4
4. Project Management and Administration	Institutional Development	1.16	7.3	0.51	6.1	0.51	10.0
<b>Global Components</b>		0.00	0.0	0.0	0.0	0.00	
<b>Total Project Costs</b>		16.00	100.0	8.30	100.0	5.12	100.0
<b>Total Financing Required</b>		16.00	100.0	8.30	100.0	5.12	100.0

Please make note that Component 3 Protected Areas Management and Biodiversity Conservation is being financed solely by GEF grant of an amount of US\$ 3.48.

## **2. Key policy and institutional reforms supported by the project:**

*Land Reform.* Through its support for community forests and long-term leases of state-owned pastures and forests to communities, the project tests transfer of resource user rights to communities, piloting implementation of the Government's decision to employ economic incentives and greater local authority as means to improve management of natural resources.

*Decentralization and Participation.* The project aims to develop an enabling environment for policy and institutional reforms facilitating institutional decentralization and increasing local participation in natural resource management. The project aims to develop the implementation framework in support of

community forest and long term land leases; microcatchment and forestry planning procedures, and to pilot good practices.

*Watershed Management.* The project will promote watershed management, facilitating horizontal and vertical integration of natural resources management. The project will test integrated resource planning approaches at community level, adding to the skills base for development and implementation of national landscape management programs.

*Biodiversity Conservation and Protected Areas Management.* The project will pave the road to concrete reform steps for defining the roles and responsibilities of MONP for protected area management, relative to other sectoral agencies; strengthening the enforcement powers of the State Inspectorate and protected areas guards; and establishing a legal mechanism for revenue retention.

*State Forest Management.* The project will support the Government of Armenia's initiative to increase the capacity of state forestry agencies for sustainable forest management and biodiversity conservation.

### **3. Benefits and target population:**

The two marzes that are the focus of the project are among the poorest regions in Armenia. The Marzes' rural population of 273,000 would benefit from increased incomes due to more productive cropland, pasture and forests. Directly the population of 100 villages will benefit from project activities. Pre-commercial thinning and conversion of coppice to high forest would produce a great deal of fuel wood that would benefit local people without harming the forests.

The project would benefit all living in Gegharkunik and Tavoush marzes through its protection of ecosystem services, such as watershed protection that will tend to secure the water supply during dry seasons and to improve the area's resilience to drought.

National, regional and local agencies responsible for natural resource management and biodiversity conservation and protected areas management will benefit from project assistance for integrated ecosystem management. The project will result in stronger community ownership and strengthen the roots of civil society.

Global benefits will accrue from conservation of globally important biodiversity in the Southern Caucasus Mountains and creation of a more effective protected area network. The project will help conserve globally significant wildlife and numerous threatened species as *Sorbus hajastana*, *Juniperus polycarpus* and *J. oblonga*, *Acantholimon gabrieljanae*, *Vicia akhmaganika*, *Vicia grossheimii*, *Larus komarovii*, *Achillea smirnovii*, *Crepis vildenovii* and other relic plants preserved from pre-historic times (golocen, plyocen). The project will strengthen Armenia's cooperation with Georgia and Azerbaijan on biodiversity conservation.

#### **4. Institutional and implementation arrangements:**

**Project Management Board.** The Project Management Board (PMB) is an interministerial body established for the preparation of the project and will continue functioning during the implementation phase. The Minister of Nature Protection will chair the PMB. Armenian regulations require that the Ministry of Finance and Economy should be represented as well. In addition, taking into consideration the multi-sectoral nature of the project, the Ministry of Agriculture, Ministry of Social Welfare and State Department of Cadastre will be represented on the Board. Representatives of Tavoush and Gegharkunik Marzes will have a deliberative voice in the Board. Participating rural communities will be represented at PMB meetings as needed. PMB will have the responsibility for overall supervision of project activities including approval of work plans and budgets and inter-agency coordination.

**Project Lead Agency and Participating Organizations.** The Ministry of Nature Protection (MONP) will be the lead Government institution responsible for project implementation in close coordination with other stakeholder agencies and beneficiary groups. However, the Department of Forestry (Hayantar) will be responsible through its district branches for implementation of Component 2, "Forest Management," under the supervision of the MONP and PMB; while Component 3, "Protected Areas Management," will be the direct responsibility of the Department of Biodiversity and Land Protection in close coordination with the Project Implementation Unit, administrations of Lake Sevan National Park and Dilijan Nature Reserve.

Hayantar will also provide forest extension services to community for implementation of forest management activities, and the Forest Research Center (FREC) will provide assistance in forest management planning and forest training activities.

**Project Implementation Unit.** A Project Implementation Unit (PIU) has been established in the MoNP. It will be responsible for administration and day-to-day management of project implementation.

Coordination among implementing agencies is crucial for project implementation, and therefore a well-functioning interface between local communities and government agencies will be established at the outset of project implementation. While coordination among institutional stakeholders at the central level will be carried out under the umbrella of the PMB, the PIU would be responsible for coordinating activities with project stakeholders and government institutions during project implementation.

A Project Implementation Unit staff in the Marzes will provide day-to-day implementation support to communities. PIU staff will: (a) provide planning and technical assistance to participating communities in the Marzes; (b) serve as liaison with the Marza governments and local agencies; (c) coordinate project activities with other donor-funded projects in the project area; and (d) popularize project activities and disseminate information. The project will provide logistical support and training for environmental and agricultural departments of the Marza governments that will be involved in monitoring project activities.

On behalf of the Government, the PIU will enter into Micro-catchment (MC) agreements with Village Councils that will specify the MC activities, implementation arrangements, monitoring requirements and budgets of annual village investment plans. The PIU will help Village Resources Management Associations (VRMAs, see below) to prepare and implement MC and forest management plans. The PIU will contract implementation services, such as technical support and supervision of implementation of annual community work plans, review of design works and supervision of work undertaken by contractors, and will carry out quality control by site visits.

**Implementation Arrangements at Watershed Level.** Implementation arrangements at the local level will

be as set out in the Guidelines for Participatory Watershed Management that were developed during project preparation. The project will strengthen existing village-level institutions and will support the establishment of VMRA as informal community-based groups which will take implementation responsibility at village level during implementation.

In each project area, the Marzpetaran's office will facilitate coordination between local stakeholders and participating communities.

Local service providers may qualify for provision of technical and implementation services and will be contracted by the PIU on a competitive basis. Existing Agricultural Support Centers in the two marzes could be contracted by the PIU to assist village resource management groups in planning and implementing community-based soil control, forestry, pasture and resource management sub-projects, farmers' training and extension support. The PIU will be responsible for independent monitoring to ensure efficient and transparent use of project funds by communities. Such monitoring will be carried out through frequent site visits, significant site presence, and preparation and dissemination of public information.

Detailed implementation arrangements are described in the PIP.

## **D. Project Rationale**

### **1. Project alternatives considered and reasons for rejection:**

**No-Project Alternative.** The alternative of delaying improvement in natural resources management to some future time was rejected because of the mounting economic and social costs associated with degradation of Armenia's nature capital and the approaching loss of globally important biodiversity in the two Marzes. In particular, more than 25% of Armenian land that was cropped ten years ago is no longer arable and 60% of the remaining cropland is in "poor" condition as defined by the FAO; 10 % of the country's forest cover has been lost in the last ten years; livestock production is declining at a rate of about 1% annually and has begun a downward spiral as a consequence of overgrazing in eroded pastures; poverty in Armenia's mountainous provinces is extremely high -- 72% in Tavoush and 65% in Gegarkhunik. Finally, at least 165 regional and endemic species are endangered as a result of poor stewardship practices such as overgrazing and ineffective erosion control.

**National-Level Multi-Sectoral Intervention through Adaptable Program Lending.** A three-phase project was considered, in which the first phase would concentrate on policy reform and institutional capacity building measures identified in the National Environmental Action Program, and the second and third phases would focus on environmental infrastructure investments. This alternative was rejected because: (i) it was judged so complex as to be not implementable; (ii) capacity to implement the broad program of legal and institutional reform that was proposed is uncertain; (iii) the impact on resource users' incomes was uncertain, and the framework offered limited opportunities for their meaningful participation and (iv) future availability of IDA funds for implementation of a national program in this area is uncertain.

**Geographically-Focused vs. Country-Wide Scope.** A country-wide environmental and natural resources management project was considered. This concept was rejected on the ground of lack of experience and sufficient institutional capacity on the part of the lead implementing agency and other stakeholders to handle a large-scale national operation satisfactorily addressing the links among natural resources degradation, poverty and income generation. At the same time, Bank experience indicates that resource degradation can be best addressed only through a watershed approach to resource management with location-specific solutions, and by working closely with local communities. A design focusing on a limited



geographic area was therefore selected to test the "watershed development" approach in Armenia, paving the way for the future wider replication. Such a "learning-by-doing approach" will build the institutional and stakeholder capacity that is critical to sustain the results of the proposed interventions.

**Self-standing GEF intervention versus IDA/GEF project.** A project focusing on protected areas was rejected in favor of a project generating local and global benefits that are complementary and mutually reinforcing; after all, realization of biodiversity benefits depends on relieving anthropogenic pressures caused by poverty.

## 2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned).

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
<b>Bank-financed</b>			
Improve efficiency of farm water resources use	Irrigation Rehabilitation Project (FY95)	S	S
Increase agriculture productivity	Agricultural Reform Support Project (FY98)	S	S
Protect rural population and socio-economic infrastructure related to dam safety	Dam Rehabilitation Project (FY99)	S	S
Improved water and wastewater services for Yerevan.	Municipal Development Project (FY98)	S	S
Establish land title registration system	Title Registration (FY99)	S	S
Support lower income groups among through improvement of basic social services and creation of employment opportunities	Social Investment Fund (FY96)	S	S
Develop and strengthen Armenia's environmental institution's capacity	Strengthening Institutional Capacity in MoNP- IDF Grant (FY 96)	S	S
Develop a mitigation plan to address the ecological problems of Lake Sevan.	Lake Sevan Action Program – IDF Grant (FY96)	S	S
<b>Other development agencies</b>			
The Netherlands Government (Grant)	Integrated Water Resources Management Plan (Bank executed)		
FAO	Forest Sector Development, Phases 1 and 2, 07/94-04/97		
USAID	Coal Resources Usage and Assessment Program 12/95-12/97		
United Nations Environment Program –	Phasing out Ozone Depleting		



UNEP	Substances, 05/97-02/98		
Global Environment Facility - GEF,	Biodiversity – Strategy and		
UNDP	Action Plan 08/97-08/98		
GEF, UNDP	Armenia Country Study on		
	Climate Change 09/96-09/98		
UNDP	Strengthening MoNP		
	05/97-01/99		
Swedish International Cooperation	Forest Resources Assessment		
Agency – SIDA	Project 07/98-03/99		
UNDP and GEF PDF A Grant	Lake Gilli Biodiversity Project		
UNDP and GEF PDF B Grant	In-Situ Conservation and		
	Sustainable Use of		
	Agro-biodiversity in Armenia		
	05/98-01/00		

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

### 3. Lessons learned and reflected in the project design:

The proposed project builds on the Bank's global experience in natural resources management and poverty alleviation project ( East Anatolia Watershed Rehabilitation, Albania Forestry Project, natural resource management projects in Panama and China etc.). Lessons from a review of Bank experience in natural resources management and poverty alleviation include the following.

It is important clearly to identify the impact of project interventions on use of natural resources and on the incomes of rural poor who use these resources. The project needs to have clear development objectives and a simple yet flexible monitoring and evaluation system to avoid activities with questionable financial and environmental sustainability or which have little overall impact.

The project's rationale, benefits and objectives should be made known to all stakeholders, through consultations and public awareness programs.

Substantial capacity often exists at the local level, even though project beneficiaries may not be able to fully demonstrate their skills at the outset of project implementation. Beneficiary training and extension programs are important, therefore, to provide the skills necessary to utilize the investments and opportunities delivered by the project in the most profitable and sustainable way.

Active participation of project beneficiaries is important in identification of problems and solutions. Activities and strategic approaches will have greatest impact and full ownership by beneficiaries if problems are solved jointly with them, not for them. Capacity and skill transfer to beneficiaries leads to the best results in practice.

Project design should be within the limits of the Government's ability to implement the project. Past environmental and natural resources management projects often suffered from over-sizing, attempting to cover diverse issues and placing large implementation/coordination burdens on environmental/natural resources management agencies that are often young and inexperienced.

Environment-friendly agricultural activities should establish a link between environmental protection and tangible benefits for local communities and other key stakeholders.

The focus of the project on participatory, community-based activities that lead to improved management and conservation of resources should be maintained; focus should not be transferred to a rural development project.

Lessons learned from other Bank projects in Armenia point to additional critical issues.

It is important that the project addresses the need for better inter-sectoral and inter-agency coordination of implementation activities.

Sufficient time should be allocated for planning to ensure adequate participation of local population in project activities and full response to new ideas proposed by the community and its individual members.

Decentralization of decision-making to the local level is critical to make the project demand-driven and to strengthen project ownership among beneficiaries.

There is a critical need to strengthen the capacity of local government staff and communities so that they can fully participate in the preparation and implementation of the proposed project activities.

In accordance with GEF guidelines a STAP review was undertaken. The review was generally positive and approval was recommended, subject to minor modifications. The STAP reviewer (Dr. Norman Myers) provided useful and incisive advice on biodiversity conservation aspects of the project as a whole. Principal points, which could usefully be applied to biodiversity conservation and protected areas management in general, were:

- (i) The advisability of defining in better detail the linkages between poverty and biodiversity losses;
- (ii) The suggestion that the team outline the potential for tourism development in the project areas; and
- (iii) A need to indicate more clearly who is responsible for the project's success

The team appreciated these points. Item (i) will be addressed through further studies and social surveys as part of implementation work. Item (ii) has been addressed in the PA management and biodiversity preparation work. Point (iii) will be addressed in terms of project institutional structures now being developed and participatory project implementation.

In addition, the reviewer provided valuable comments on the justification for the project in terms of biodiversity conservation ( Annex [    ]).

#### **4. Indications of borrower and recipient commitment and ownership:**

Government commitment to and ownership of this project is evident in the actions it has taken to promote project preparation to date.

- The Government is aware of and has addressed project financing needs: (i) Project preparation was undertaken under a PDF Block Grant requested by the Government. (ii) The GOA submitted a PPF request for an advance of US\$450,000 to proceed with technical preparation of project activities including agricultural activities which require seasonal inputs. (iii) During pre-appraisal the MOFE indicated a commitment to allocate project counterpart funding in the required amount in its budget for 2002.

- The Government committed the time of senior ministers to the project in decreeing establishment of a Project Management Board with high-level ministry representation. The Project Ministry Board has met during project preparation and the members thereof have shown their interest and commitment, following preparation progress and resolving such issues as arose.
- The Government has, by decree, established the PIU (which is prepared to launch implementation).

The Government's commitment to addressing the underlying issues is also clear.

- Armenia's NEAP, adopted by the Cabinet of Ministers in December 1998, identified national environmental goals, objectives and priority activities.
- The Ministries of Nature Protection, of Finance and Economy, of Agriculture, and of Social Welfare have made a commitment to adopt demand-driven approaches to the provision of rural social and environmental services.
- The GOA has indicated its interest to use the project implementation experience to potentially replicate the project activities on a nationwide scale.

## **5. Value added of Bank and Global support in this project:**

The project is a logical follow up of the NEAP and Lake Sevan Action Plan, which identified a set of national priorities and will continue the support to the implementation of a number of measures of the environmental reform agenda. The project is in full correspondence with the NEAP and LSAP and BSAP priorities. The value added of Bank support in this project lies in its global experience in: (i) developing and implementing community-based strategies for natural resources management; (ii) establishing a community based institutional arrangements for natural resources management; and (iii) acting as a catalyst for mobilizing co-financing from various multilateral and bilateral sources to contribute towards project needs and future investments.

Furthermore, the Bank's involvement would promote valuable lessons and initiatives tested by the project to be scaled up into a larger program in the future and to be used for the development and implementation of the similar initiatives in other CEE/NIS countries. The GOA has indicated its interest to use the project implementation experience to potentially replicate the project activities on a nationwide scale. Specifically, the project implementation experience will be used to replicate project activities as part of a national system of protected areas.

The GEF value added comes from its global experience in the design, implementation, and financing of biodiversity conservation projects. GEF support is justified by the global importance of the province's biodiversity and by the unique opportunity to strengthen the management of globally and regionally important protected areas. The Bank's suite of GEF and biodiversity projects in the Caucasus region provides opportunities for promotion of exchange of ideas, cross-fertilization with other GEF projects in the region, and strengthened trans-boundary cooperation in biodiversity monitoring and evaluation, review, and scientific oversight. Finally, the value of the GEF support comes from providing additional funds in a form of grants to allow the farmers to be involved in biodiversity conservation projects.

Without the Banks and GEF support the GOA and NGOs will not be able to ensure protection of Armenia's

diverse and abundant biodiversity, which is likely to continue from unsustainable timber and fuel wood harvesting, overgrowing and associated disturbance, illegal hunting and habitat loss and fragmentation.

## **E. Summary Project Analysis** (Detailed assessments are in the project file, see Annex 8)

### **1. Economic (see Annex 4):**

- ☒ Cost benefit      NPV=US\$1.5 million; ERR = 20 % (see Annex 4)
- ☐ Cost effectiveness
- ☐ Incremental Cost
- ☐ Other (specify)

*Economic (the details of economic and financial analysis are presented in Annex 4).*

**General.** An overall cost-benefit analysis has been carried out for the Community-Based Watershed Management Component and the State Forest Management Component.

Net present value (NPV) and Economic Rate of Return (ERR) have been estimated for each project micro-catchment and for the project area as a whole. The economic analysis includes direct economic benefits from goods and services that can be quantified based on observable quantities and existing market prices. The incremental benefits quantified in the analysis come from: (a) increased crop production; (b) improved livestock production; (c) incremental timber productivity from improved forest management and better harvesting techniques; and (d) selected non-timber products (i.e., honey). Other economic benefits generated by the project include (a) benefits from rural infrastructure (i.e., access roads, landslide control, pasture watering points, and biogas production); (b) non-timber forest benefits (berries, mushrooms, etc.); (c) downstream environmental benefits (reduced sedimentation from soil erosion); and (d) regional and global environmental benefits (biodiversity conservation) are evaluated in qualitative terms.

The ERR for the Community-Based Watershed Management Component over the whole project area is estimated at 23%, based on the implementation plans for the first year's micro-catchments. Individual micro-catchment investments will be subject to separate economic and financial analysis during the project implementation period, before they are eligible for project financing. Investments in small-scale irrigation infrastructure are subject to a separate technical and economic feasibility analysis carried out by IFAD. It is expected that the appraisal of individual sub-projects will eliminate economically non-feasible sites and increase the overall ERR of the project.

The ERR for the State Forest Management Component is estimated at 16%. The total ERR (economic and full environmental benefits) of the project is estimated at 20%.

**Incremental Cost Analysis.** The Baseline Scenario includes expenditures of the Government of Armenia on natural resources management and biodiversity conservation; forestry management and rural development activities carried out by a number of donor agencies (SIDA, UNDP, FAO) and several World Bank rural development projects that indirectly promote sustainable natural resource use and mitigate environmental pressures through investments into basic village infrastructure and alternative income-generating activities within project marzes. The cost of the Baseline Scenario over the life of the project is estimated at US\$20.1 million. The GEF Alternative will finance incremental costs of project activities that generate global environmental benefits. The cost of implementing the GEF Alternative during the same time period is estimated at US\$25.1 million. The incremental cost of protecting global biodiversity is US\$5.0 million, estimated as a difference between the cost of the GEF Alternative and the Baseline Scenario.

## **2. Financial (see Annex 4 and Annex 5):**

NPV=US\$ 0.44 million; FRR = 14.7 % (see Annex 4)

### **Fiscal Impact:**

The Government contribution of direct fiscal resources to the project is US\$1.51 million. It is expected that the project will generate a significant economic surplus, with has a positive long-term fiscal effect.

The direct fiscal benefits of the project would include increased land taxes, as a result of higher yields and improved crop productivity. It is expected that the *potential* land tax revenue, which can be collected would be in average some US\$50,000 per year, or US\$0.3 million over the six-year project implementation period. Positive indirect fiscal impact is also expected from payments of pasture and forest use fees. In addition, by raising the value of marketable farm production output the proposed project is expected to have a positive impact on the national and local budgets through increased agricultural tax revenues (i.e. VAT, income tax, etc.).

The project would involve hiring contractual labor for community investment and forest plantation programs on a short-term basis, offering additional employment opportunities in this way to surplus household labor. The Forest Management component is estimated to generate 1,269,000 labor-days over a project period of five years.

There is a potential to collect and retain sufficient revenues to cover minimum recurrent costs related to the management and operation of protected areas by the end of the project. For Dilijan State Reserve alone, potential revenues are at least US\$65,000 per year by the end of the project. For Lake Sevan National Park, the potential for revenue generation is significantly higher. The project would increase the capacity of the protected areas to capture these revenues through strengthening the management and enforcement and providing investment into basic park infrastructure. The project would review legal and regulatory impediments for the protected areas to collect and retain a portion of revenues from commercial and noncommercial activities in the protected areas, and possibly in the surrounding buffer zones.

There is also a great potential for revenue collection through the State Inspectorate, which presently collects about US\$300,000 from Tavoush and Gegharkunik Marzes through various resource user fees. These revenues only represent 20% of potential collections. The project will develop a more rational system of user fees for natural resources (i.e. fish, timber, fuelwood, mushrooms, sea buckthorn berries, fodder, medicinal plants) and levies on tourism and recreation industries, and will strengthen institutions responsible for the collection and enforcement of these fees.

## **3. Technical:**

Armenia is blessed with a core of highly educated and experienced technical specialist and scientists who will be able to make solid contributions to project implementation and to the development and operation of effective project monitoring. While this will reduce the requirement for external specialists and scientists, it does not obviate the need entirely. Highly specialized external consultants working in partnership with country experts will still be required at various points to help guide the development of forest management and protected area planning, legal, policy and regulatory review/reform, planning within the protected areas, design of monitoring systems, tourism planning and marketing, etc. The project contains a substantial training element. While a large portion of this investment is made locally for greater cost-effectiveness, there are provisions for a few specialized study tours and a twinning arrangement

specifically targeting exchange of experience with appropriate protected areas in other countries.

The technical features of Components 1 and 2 (the production components) will be based on successful experience from other projects in Armenia and past scientifically based practices abandoned during the transition period. Specific technology or technical packages used in the project are simple and already well known and established in the country or in the region. Local design and supervisory capacity will be used for infrastructure. The project will apply site-specific approaches for rotational grazing under dryland conditions; techniques for prevention of soil erosion; crop rotation; and both afforestation and natural regeneration of forests. In terms of physical infrastructure and equipment, with some minor exceptions, these will be locally purchased so that they can be maintained and operated at an appropriate level of recurrent cost. The principal exception however, is the GIS to be established in the MoNP to support protected area monitoring and mapping. While the technology is well known and not overly complex, the MoNP has no experience with these systems. The Environmental Research and Management Center at the American University of Armenia (Yerevan) has a GIS as well as international expertise in GIS design and applications. This would be applicable to protected area monitoring and mapping, including advice on aerial photographs and satellite imagery, training, thematic mapping and applications.

#### **4. Institutional:**

*National Level.* The management of natural resources is the responsibility of the Ministry of Nature Protection, through its mandate for environmental and nature protection policy development and implementation, monitoring of resource utilization and environmental compliance, dissemination of environmental information and biodiversity conservation in Armenia. The Ministry of Agriculture (MOA) is also responsible for promotion of agricultural land productivity and pasture management through its local departments. MONP and MOA staff members are well educated and trained in technical areas and are highly committed to their current mission that focuses on protection of natural resources. Despite problems of low pay and periods of nonpayment of salaries, staff members maintain high professional standards and are committed to making changes in the management of environment and natural resources and conserving biodiversity within the national system of protected areas. An institutional capacity assessment of key implementing agencies carried out during project preparation identified the following areas for improvement:

- development of stronger organizational identity and understanding and ownership of new policy principles for sustainable natural resources management;
- development of the planning and implementation capacity and the management skills needed for decentralized management of natural resources involving communities;
- improved communication and institutional collaboration among government agencies (MOA, State Department of Cadastre, Ministry of Social Welfare, local governments and Haymanks) whose cooperation is essential to the success of the project.

Management of state forests is carried out by the Hayantar and its regional enterprises, while FREC is responsible for forestry statistics and forest planning. In general, agency responsibilities for state forest functions in Armenia are not clearly outlined; tasks are duplicated and responsibilities not well defined. Only part of the staff of Hayantar have appropriate professional forestry education, personnel turnover is high, and widespread corruption is a problem acknowledged by the Government. Knowledge of new forestry methods is very limited among forest workers and contractors. Vocational training for the Government's forest work force, or for rural people in forestry, does not exist at present. The emergence of a private sector in the forestry will require substantial support from extension services, accompanied by law enforcement and implementation measures. The following areas for improvement critical to the success



of the project have been identified

- greater openness and transparency in the forest sector;
- adoption of a new mandate for Hayantar that concentrates on management of state forests;
- development of human resource and institutional capacity for modern forest management incorporating biodiversity conservation;
- development of an extension system that meets the needs of communities involved in community forests.

The project's approach is to shift forest and protected areas management from its historic focus, conservation and restricted visitor activities, to a focus on sustainable use and ecosystem management that builds on stakeholder participation while remaining compatible with the vitally important goal of conserving globally important biodiversity. To that end, the following areas for improvements to be supported by the project have been identified:

- reorientation of the MoNP and its protected areas to user-oriented institutions charged with facilitating people's access to and education about protected area resources;
- updating protected area management policies and practices and developing capacities in marketing, public outreach and service delivery;

*Marz level.* At the marz level, agencies responsible for monitoring and administration of environmental resources include marz environmental inspectorates, local departments of environment and agriculture, and the administrations of protected areas (e.g. Dilijan State Preserve and Lake Sevan National Park authorities). The functions of the natural resources management are based on one-way administration and implementation from central to local level, while the communication with local communities and monitoring of their resource use has been rather weak. Their main strengths are established connections and status among the communities and knowledge of their problems and development potentials. Their main weaknesses are lack of adequate technical capacities, shortage of qualified specialists, which may affect their project implementation capacities.

Agricultural extension programs are implemented through Marz Agricultural Support Centers. Despite their highly qualified technical staff and their experience, they lack information about new technologies and monitoring skills.

*Project Capacity Building.* During the first year and the second year of project implementation the project will help address these institutional issues at both the national and local levels, based on the collaboration built during preparation. Capacity building, organizational and functional improvements will be initiated through training for capacity building, study tours, public outreach and establishing a participatory planning process for watersheds, forests and protected areas.

#### 4.1 Executing agencies:

The Ministry of Nature Protection (MONP) will be the lead agency responsible for project execution in close coordination with other stakeholder agencies and beneficiary groups. The Department of Forestry (Hayantar) will be responsible through its district branches for implementation of Component 2, "Forest Management," under the supervision of the MONP and PMB. Component 3, "Protected Areas Management," will be the direct responsibility of the Department of Biodiversity and Land Protection in close coordination with the administrations of Lake Sevan National Park and Dilijan Nature Reserve. Hayantar will also provide forest extension service to community forest management activities (Component 1), and the Forest Research Center (FREC) will implement forest management planning and forest

training/extension activities.

#### 4.2 Project management:

The Project Management Board (PMB) has been established for the preparation of the project and it will continue functioning during project implementation. The Minister of Nature Protection will be the Chairman of the Board. Although the MONP is the lead coordinating agency in project implementation, the active participation of other Ministries, local governments, scientists and local communities will be critical to successful implementation. Therefore, adequate composition of the PMB, envisioned as the project coordinating mechanism, is important, and the PMB will be maintained throughout the project with membership and functions satisfactory to the Bank. The same will be true of the PIU, which has been administratively established within MONP. Although the PIU is familiar with small-scale procurement and financial management it needs to build capacity for project implementation. Adequate staffing of the PIU will be a condition for project effectiveness.

#### 4.3 Procurement issues:

An assessment of the PIU's capacity to carry out procurement according to the Bank guidelines was carried out during pre-appraisal. With regard to procurement capacity, the review rated the PIU in the high-risk category. Appropriate technical assistance will be provided to enhance the PIU's management and financial capacity before effectiveness and during the first two years of implementation.

Proposed procurement arrangements are summarized in Annex 6 and Tables [ ] and [A1]. Procurement plans will be updated on an annual basis in line with the micro-catchment plans. Consulting services, goods and works financed or co-financed by the Bank shall be procured in accordance with the Bank's procurement guidelines.

#### 4.4 Financial management issues:

The financial management arrangements that the PIU have established cover all the phases of the NRMPPR project that are:

1. Preparation Phase (PDF Block B GEF Grant)
2. Project Preparation Facility (IDA Advance)
3. NRMPPR Project implementation (IDA, GEF, SIDA and Counterpart funding).

The system for the Preparatory Phase is currently in use and proves to be satisfactory. The same basic arrangements used for the Preparation Phase have also been put in place for the PPF advance and NRMPPR project implementation phases and will be used as soon as they will become effective.

The PIU in the Ministry of Nature Protection is responsible for the financial management of the project. A project accountant has been hired in September 2001. A computerized accounting system able to produce the Financial Monitoring Reports (FMRs) have been set up for project implementation.

The banking system in Armenia is well developed though still weak. A Special Account in US dollars and a sub-account in DRAM has been opened during preparation phase for the purpose of PDF Grant resources, in local branch of HSBC Bank Armenia, acceptable to the Bank. The sub-account is used for small payments in local currency. Since the implementation of this preparatory phase has started in early October 2001, the accountant has been able to familiarize with the Bank financial management requirements while setting up a spreadsheet based accounting system that has been recently replaced by the software.

The Financial Management Assessment has confirmed that the arrangements currently in place satisfies the Bank's minimum financial management requirements. It is expected that during the course of the project, once PIU capacity is fully built, and the credit and grant disbursements will be carried out in



accordance with the Bank project financial management requirements, using the Financial Monitoring Reports (FMRs).

## **5. Environmental:**

### **Environmental Category: B (Partial Assessment)**

5.1 Summarize the steps undertaken for environmental assessment and EMP preparation (including consultation and disclosure) and the significant issues and their treatment emerging from this analysis.

*Environmental Assessment.* Based on the Environmental Assessment conducted during preparation, the project is classified as Category B. The project objectives are to achieve a range of positive environmental and social impacts, and the components of the project have been designed to enhance the positive outcomes and to also include mitigation measures for possible adverse or negative impacts. The EA process involved a secondary assessment of possible impacts, both positive and negative as well as an assessment of the proposed enhancement and mitigation measures.

The project will have an overall positive environmental impact by reversing current trends of natural resources degradation in mountainous areas through improved watershed management. The project will have positive impact by conserving globally and nationally significant biodiversity in two protected areas and in watersheds in the project area. The environmental benefits of improving natural resource management would include increased productivity of grazing lands, better protection against soil erosion, and more sustainable use of biological resources. In the short term, unsustainable forest and pasture use in the project areas would be reduced. These benefits are expected to have a noticeable impact before the end of the GEF funding. The primary major impacts are not individually significant but have the potential to be cumulatively significant.

Public consultations were held in project communities during project preparation and during the EA public consultations and Disclosure process. Participating communities, stakeholders and interested parties were fully informed of the environmental assessment process and given opportunity to voice their concerns and opinions. Consultations were carried out at two levels: national and local level.

The major expected positive and potential negative impacts identified in the EA are summarized in Annex 14 .

Given the nature of the work to be financed under this project, the project is classified as Environmental Category "B."

d. Status of Category A assessment: B	EA start-up date:	08/15/2001
	Date of first EA draft:	10/18/2001
	Current status:	Final draft completed on December 18,2001. Public consultations completed in January 2002. Final EA issued February 1, 2002.

**Proposed Actions:** The MONP and PIU will be responsible for ensuring that mitigation measures included in the EMP are incorporated in micro-catchment, forest management and protected areas management

plans.

**Status of any other environmental studies:** Completed National Environmental Action Plan, Lake Sevan Action Program, and National Biodiversity Strategy and Action plan.

## 5.2 What are the main features of the EMP and are they adequate?

The EMP identifies minor issues identified as having potential for negative impacts and makes recommendations for mitigation measures. To ensure that these measures are closely monitored regular inspections will be carried out by Marza environmental departments and supplemented by PIU and Bank supervision during implementation. Management plans have been worked out in detail for each project component and activity and are included in the EA. The issues included in the environmental management plan and in relation to each project component include:

- institutional roles and responsibilities in relation to each of the mitigation and monitoring measures;
- any additional training which will be required to successfully undertake the measures described;
- timing in relation to the project process; and
- provisional cost estimates of specific mitigation measures (including any required training).

The main mitigation measures are increased institutional and management capacity, and the project components incorporate these mitigation measures. In addition to management plans which include impacts, mitigation measures and best practices, institutional responsibilities, monitoring and technical assistance requirements and cost estimates the EA contains environmental management guidelines for contractors which will be developed in more details during implementation.

Specific issues covered in the environmental management plan are:

- small scale construction including rehabilitation of degraded field and forest and tracks for implementation of MC plans and Forest management plans, with potential negative impacts from increased noise, soil compaction, disturbance on wildlife. Implementation of Best Practice Manual for Road Rehabilitation and guidelines to contractors will be implemented during the design and construction, with adequate supervision and monitoring from the PIU;
- small-scale construction and/or renovation of national park infrastructure, including visitor centers, central offices, field stations, checkpoints and guard stations, a rustic hut, trails and other tourism infrastructure, will have minor direct impacts on flora and fauna;
- increase in recreational use of the two protected areas under the protected areas component would have minor increases in noise and disturbance to wildlife and may require refuse collection at frequently visited sites. Tourism will be restricted to appropriate zones developed during management planning for each protected area.

Details of EMPs, environmental screening and monitoring are provided in Annex 14.

## 5.3 For Category A and B projects, timeline and status of EA:

Date of receipt of final draft: December 18, 2001

Final EA released on February 1, 2002.

## 5.4 How have stakeholders been consulted at the stage of (a) environmental screening and (b) draft EA

report on the environmental impacts and proposed environment management plan? Describe mechanisms of consultation that were used and which groups were consulted?

Public Consultation and Disclosure Plan (PCDP) was prepared for the project. The objective of the PCDP was to ensure that all stakeholders and interested parties were fully informed of the environmental assessment process and that they had the opportunity to voice their concerns and opinions on environmental issues and management during the EA preparation process. Consultation has been carried out at national and local levels.

Public consultation took place in two phases. Firstly, consultation during the EA preparation process helped to identify key environmental issues and provide information on stakeholders' concerns about and views of potential environmental impacts. Secondly, consultation at the draft EA stage allowed stakeholders to review findings and comment on proposed mitigation and management options.

During implementation public consultations on annual community MC and FM plans will take place and will be facilitated by the PIU staff.

#### 5.5 What mechanisms have been established to monitor and evaluate the impact of the project on the environment? Do the indicators reflect the objectives and results of the EMP?

Measures for mitigation of potential impacts and monitoring arrangements will be included in the MC, FM and PA plans, which will be used as a basis for monitoring of project impacts. EPMs will include in parallel impacts and mitigation measures, responsibility and frequency of monitoring and will determine specific technical training needs for carrying out impact monitoring. Marza environmental and agricultural departments will carry out impact monitoring supplemented by PIU and Bank supervision.

### 6. Social:

#### 6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes.

The project beneficiaries are a homogenous group of cash poor subsistence farmers (See Annex 11 for detailed social assessment). The project is designed to improve the livelihoods of these farmers through an integrated program of interventions in agriculture, forestry, and protected areas. Between 65 and 72 percent of households live below the poverty line. Household size and altitude, which are close correlates of poverty, are also above average in the project area. Education, another close correlate of poverty, is below average in the project area.

The target population relies heavily on the natural resource base for its livelihood. While farms are slightly larger than normal, production is rainfed and extensive. The primary activity of approximately 70 percent of rural households is subsistence farming, with small amounts of livestock bartered in local markets. The most commonly grown crops are potatoes, beans, and wheat. The most common livestock are cattle, sheep, and poultry.

The project will contribute to the following socioeconomic development outcomes:

*Equity.* Labor intensive project interventions, such as tree planting, will offer poor villagers income-earning opportunities. New management regimes on agricultural lands, high mountain pastures, and community forests will enhance the productivity of resources on which the poor are most dependent.

*Social Cohesion and Empowerment.* The project encourages development of community structures and

their organizational capacity (such as watershed management boards and village user groups). It empowers beneficiaries by giving them a voice in natural resource management decisions and giving them a role in the development of park management plans and local infrastructure development.

*Transparency and accountability.* Institutional reform, decentralization, and local participation in developing resource management plans contribute to more transparent and accountable government and state management of land, forest and protected area resources.

## 6.2 Participatory Approach: How are key stakeholders participating in the project?

The project has been developed in a participatory manner and these activities will serve as a template for implementation. Key stakeholders consulted during preparation include villagers and their representatives, Government staff involved in implementing the project, and environmental Nongovernmental Organizations.

Villagers participate in the project through Participatory Planning Workshops. Government staff will participate in implementation and will receive training on methods to encourage and manage community involvement. For example, tree planting activities will all involve community participation in species selection, priority areas for plantings, undertaking the work, and taking care of seedlings. Local NGOs will be involved in supervising and monitoring implementation.

### a. Primary beneficiaries and other affected groups:

Primary beneficiaries and other affected groups include local forest, agricultural and pastoral communities, forest harvesters, agricultural products marketing agents, local and national environmental NGOs, local government and local units of the implementing agencies. The project aims to involve through wider participation and diversity of age, gender and social status all community members that are particularly vulnerable to current economic transition. The social assessment has identified that a large share of men seek employment in urban areas or abroad, while farm work remains the responsibility of women. Therefore, women are expected to be among the primary beneficiary group of the project. Approximately 15% of the project beneficiaries are refugees, who are especially vulnerable social group, as they often lack opportunities for alternative employment. The project will strengthen community social structures which is expected to lead to greater cohesiveness and cooperation to use and manage common resources.

b. Other affected groups: These include local NGOs (Green Union, Eco-Club Tapan, Byurakn), academic institutions (National Academy of Sciences and universities), local /marza and village government, private sector (e.g. small rural enterprises, tourism operators, etc.), and people using the resources in the protected areas.

## 6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

Civil society organizations and NGOs have shown interest in the project and have been consulted during preparation. The involvement of NGOs has been actively sought through identification and design process in accordance with Good Practices Guide on involving Nongovernmental Organizations in Bank supported activities. (GP 14.70). A consultation was undertaken with representatives from environmental NGOs to discuss the forestry component of the project and their views have been incorporated into the project design. Civil society and NGOs will continue to be involved during implementation. Specifically, they are expected to play a role in monitoring, training awareness raising, institutional capacity building and supporting community associations, implementation support to concrete poverty reduction activities.

#### 6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?

The project will support establishment (or work with existing) of water, pasture and forest resource user associations, which are voluntary community based implementing organizations. They will be empowered by participating in the preparation and implementation of village micro-catchment plans. They will have the opportunity to participate in the workfare program. They will be consulted in the development of management forest and protected area plans. The resource user associations will be supported by locally elected Village Councils. Village Councils represent the interests of the communities in the Marza governments. The project will involve independent local NGOs who will monitor implementation of micro-catchment plans and ensure equitable and transparent distribution of benefits to all beneficiary groups.

#### 6.5 How will the project monitor performance in terms of social development outcomes?

The social development outcomes will be monitored and evaluated through a simple system of annually administered rapid household surveys and focus group discussions. The household survey instrument has already been developed during project preparation and a baseline survey has been completed. Follow-up surveys will be conducted in project and non-project villages. The surveys will measure the change in productivity and incomes associated with the project interventions. PIU is responsible to carry out annual surveys as part of overall monitoring and evaluation work. The focus group discussions will monitor transparency, accountability, social cohesion and empowerment in target communities. Feedback from the focus group discussions will be evaluated and used to improve project implementation.

### 7. Safeguard Policies:

#### 7.1 Do any of the following safeguard policies apply to the project?

Policy	Applicability
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Natural Habitats (OP 4.04, BP 4.04, GP 4.04)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Forestry (OP 4.36, GP 4.36)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Pest Management (OP 4.09)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Cultural Property (OPN 11.03)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Indigenous Peoples (OD 4.20)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Involuntary Resettlement (OP/BP 4.12)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Safety of Dams (OP 4.37, BP 4.37)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)*	<input type="radio"/> Yes <input checked="" type="radio"/> No

#### 7.2 Describe provisions made by the project to ensure compliance with applicable safeguard policies.

The project triggers OP 4.01 which requires preparation of EA and a plan of mitigation measures for activities having potential environmental impacts. The EA and EMP contain measures, responsibilities and monitoring requirements to ensure that Bank safeguard policies are complied with. Requirements for implementation of mitigation measures will be integrated in the MC, FM and PA management plans. These will become part of project implementation and supervision arrangements. Specific legal provisions in the Credit Agreement and Grant Agreements ( see Section 3.01) will ensure adequate implementation of EMPs and compliance with safeguards.

The project complies with the objectives of OP 4.36 Forestry, namely " to reduce deforestation, promote afforestation, reduce poverty and encourage economic development". The forest management component applies the Sustainable Forest Management concept where the protection and production functions of

forests are given equal value. Sustainable forest management also supports an ecosystems approach and pays attention to landscape protection in order to reduce the impact of forestry operations on natural ecosystems and landscapes. Exotic species and provenance will not be used in reforestation activities. Forest management plans will identify and protect critical habitats and threatened species or ecosystems. The Government is committed to improve the ecological value of forests and to secure their sustainable management which is promoted by the project and therefore the policy OP 4.36 is not triggered.

The project is designed in compliance with OP 4. 04, Natural Habitats. It does not involve conversion of natural habitats and is designed to improve natural habitats protection.

Finally, the project is designed in compliance with OP 4.12. Due consideration has been given to the perceived welfare risks from enforcement of protected area management plans and possible new zoning, and enforcement of existing laws on activities in certain zones of the protected areas. The zoning restrictions on grazing, fuel wood and timber extraction, fishing and hunting will be identified in the management plans for protected areas that host globally important biodiversity. The plans will be developed through participatory process involving local communities. The Process Framework (see Annex 13) has been designed and will be implemented in accordance with OP 4.12 para [ 7 b ].

## F. Sustainability and Risks

### 1. Sustainability:

The project will create conditions for land use that address the sustainability of proposed interventions at watershed and household level; in particular, institutional stability, financial sustainability, and a high level of ownership.

*Institutional stability* is being promoted by consensus-building on the project design among a wide range of stakeholders and by adopting a participatory process throughout. Most of the implementing institutions are at the local level, and therefore strong participation and better coordination among the Ministries responsible for natural resources planning and management (MOA and MONP and Hayantar) and their local departments and district branches are critical for sustainability of project investments.

Second, *financial sustainability* is a clear necessity. This is to be pursued by a selection of investments and activities that will generate income streams over time, often in the sense of increased profitability of ongoing natural resources use, and which rural communities and producers' organizations will become capable of managing and maintaining over time.

Third, a *high level of ownership* of the planning and implementation process by project beneficiaries is critical for the project success. Early involvement of key stakeholders ( i.e. village communities, farmers, NGOs, local authorities) in decision making and later during implementation will increase the chances of sustainability. The project will promote equity among community members as most households will gain access to project investments.

The sustainability of GEF biodiversity projects elsewhere in the region has been considered good ( Romania, Ukraine). The project will address the problem of financial sustainability by designing the project with activities that promote nature-based tourism, and by strengthening mechanisms for the MONP to collect user fees and other charges that finance the long-term maintenance cost of protected areas.

### 2. Critical Risks (reflecting the failure of critical assumptions found in the fourth column of Annex 1):

Risk	Risk Rating	Risk Mitigation Measure
------	-------------	-------------------------



<p><b>From Outputs to Objective</b></p> <p>Impacts of subprojects on incomes and non-cash benefits is lower than estimated.</p> <p>Weak local institutions to provide adequate technical assistance.</p> <p>Local communities do not understand benefits of sustainable use of natural resources or have insufficient interest to participate in project activities.</p> <p>Pilot projects are not replicated country wide.</p> <p>Central line ministries fail to provide coordinated support for integration of biodiversity conservation into their planning systems</p> <p>Water level and waters quality of Lake Sevan continues to decline, further compromising water quality and aquatic biodiversity</p> <p>Illegal resources use does not decrease in response to better understanding and participation in management planning and implementation, and improved monitoring and enforcement</p> <p>GOA and MONP are unable to overcome resistance to implement PA management plans and remove defunct structures</p>	<p>M</p> <p>M</p> <p>M</p> <p>M</p> <p>S</p> <p>S</p> <p>M</p> <p>S</p>	<p>Detailed financial analysis of the natural resources management and income generating activities to be financed by the project will be carried out. Transparent procedures to select and reach target population will be prepared.</p> <p>Training will be provided to local institutions and NGOs.</p> <p>The project will provide extensive support at the community level. Supported activities must be able to generate financial benefits quickly. Wide dissemination of information about economic and financial benefits of proposed activities. Ensure that the local communities are allowed to retain the benefits.</p> <p>The project will disseminate results of projects.</p> <p>PMB and Steering Committee for the BSAP which includes central key Ministries will be involved in mainstreaming activities</p> <p>Beyond the scope of the project, the Government implements measures to improve institutional coordination of water balances; an EA for the Sevan park basin will be undertaken and built into park management planning; new economic incentives will be proposed to reduce effluent levels into the lake; the park will be equipped with improved outflow meters and water quality monitoring equipment.</p> <p>Integration of the three project components will provide substantial opportunities for local people earn income, directly through project activities and small grant programs</p> <p>PA management plans implementation will start after PA plans are developed and enforcement capacity of respective departments strengthened; owners of defunct structures identified for removal will be given full recourse under the law to remove them on their own accord.</p>
--	---	---

Project agencies do not maintain cooperation and collaboration	S	Project approach builds on strong local ownership to ensure smooth implementation: Inter-agencies collaboration will take place within the PMB, established to ensure horizontal coordination of multi-sectoral solutions at the watershed level.
<b>From Components to Outputs</b>		
Failure of local communities to organize themselves to participate	M	Ensure that some preparatory work is done (i.e., intensive consultation with communities, development of micro-catchment development plans) before project effectiveness.
Delays in project implementation as a result of the limited capacity of the PIU. Continuity in PIU staffing is not assured by the implementing agencies	M	Enhance local staff capacity prior to project effectiveness. TA will be provided to enhance project management and financial capacity before effectiveness to enhance the overall execution capacity of the recipient. PIU staff changes will be approved by the Bank
Inadequate Government co-financing of project activities	S	Macroeconomic stabilization and revived economic growth are expected to continue. Counterpart financing will be a condition for effectiveness
Parliament will delay ratification of the loan	S	Carry out policy dialogue by the MoNP in close consultation with top decision-makers
Project inputs not available in a timely manner	S	The village annual plans will be prepared at approved at the end of the planning year
Lack of governance and improper use of project funds	S	Adopt accounting standards to be maintained by the PIU and implementation assistance consultants; devolve management and implementation to beneficiaries where peer group pressure can reduce the risk of corruption
<b>Overall Risk Rating</b>	S	

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N(Negligible or Low Risk)

### 3. Possible Controversial Aspects:

It is not expected that the project will be controversial. The proposed interventions build on international and regional experience and have been given high priority by the Government, civil society and local people. One potential area of controversy has been noted, and the project design has sought to address it. There may be controversy arising from community perception of restricted access to resources in the protected areas. Management of possible concerns is addressed in the project design, which tests participatory planning and community management of landscape resources. This information sharing is expected to result in the free adoption of a new attitude to common resources and corresponding changes in natural resources use.



## G. Main Loan Conditions

### 1. Effectiveness Condition

- (i) Provide evidence to the Association that PIU has been established and is operational in a manner satisfactory to the Association. This includes staffing, training and premises for the PIU offices.
- (ii) GEF grant has been executed and delivered and all conditions precedent to its effectiveness have been fulfilled;
- (iii) Project Operational Manual, satisfactory to the Association prepared and approved by the Project Management Board;
- (iv) Deposit initial Government financial counterpart contribution of US\$75,000 in the Project Account as agreed during negotiations.

### 2. Other [classify according to covenant types used in the Legal Agreements.]

#### *Conditions for Board approval*

- (i) Prior to the Board the Borrower shall carry out a time bound action plan acceptable to the Association for the establishment of a fully operational project financial management system.

#### *Specific legal covenants measuring implementation progress and agreed during negotiations are as follows:*

- (ii) Project mid term review will be carried out by the Armenian authorities, with scope to be agreed with the Bank, by March 31, 2005;
- (iii) Initiate organizational and change management process for the Hyantar, in accordance with an action plan satisfactory to IDA, by December 31, 2003;
- (iv) Adopt and initiate implementation of protected area management plans for Dilijan Reserve and Sevan Park not later than eighteen months after project effectiveness;
- (v) Independent annual financial audits of Hayantar should start not later than June 30, 2003;
- (vi) Present to the National Assembly draft regulations providing for legal and regulatory framework for the transfer of forest management and user rights to territorial and local administrative governments by September 1, 2004;
- (vii) Establish and operate according to a business plan an education center under FREC training not later than December 31, 2003, and
- (vii) Establish an inter-ministerial task force to strengthen prevention and elimination of illegal harvesting formed by the Government by December 31, 2002.

## H. Readiness for Implementation

- ☐ 1. a) The engineering design documents for the first year's activities are complete and ready for the start of project implementation.
- ☒ 1. b) Not applicable.
- ☐ 2. The procurement documents for the first year's activities are complete and ready for the start of

project implementation.

- ☒ 3. The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.
- ☐ 4. The following items are lacking and are discussed under loan conditions (Section G):

Micro-catchment Plans have been prepared for 19 villages in eight watersheds during project preparation. During negotiations the GOA will name four watersheds which will implement MCP during year 1.

## **I. Compliance with Bank Policies**

- ☒ 1. This project complies with all applicable Bank policies.
- ☐ 2. The following exceptions to Bank policies are recommended for approval. The project complies with all other applicable Bank policies.

---

Adriana Jordanova Damianova  
**Team Leader**

---

Laura Tuck  
**Sector Manager/Director**

---

Judy M. O'Connor  
**Country Manager/Director**

## Annex 1: Project Design Summary

### ARMENIA: Natural Resources Management and Poverty Reduction Project

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<p><b>Sector-related CAS Goal:</b> Environmentally sustainable growth through improved management of ecosystems.</p> <p><b>GEF Operational Goal:</b> Protect and conserve regionally significant biodiversity in sensitive mountain and forest ecosystem in the Southern Caucasus.</p>	<p><b>Sector Indicators:</b> Resource based economic growth in participating rural communities/villages attributable to the project.</p> <p>Implementation of landscape watershed plans linking protected areas and critical ecosystems;</p> <p>Effectively managed protected areas in the project area;</p> <p>Stabilization of key threatened ecosystems and critical habitats in the project area.</p>	<p><b>Sector/ country reports:</b> Economic, Social and Sectoral country reports.</p> <p>Ministry of Social Welfare (MOSW) household survey data and poverty head count.</p> <p>State statistics</p> <p>Official reports registering illegal logging;</p> <p>Study on illegal forestry, forest surveys and project reports;</p> <p>Biodiversity monitoring reports;</p> <p>Independent monitoring of project implementation progress.</p>	<p><b>(from Goal to Bank Mission)</b> Continued economic growth and political stability.</p> <p>Return to average climatic conditions.</p> <p>Local communities honor their commitment to implement all project activities identified in tradeoff matrix.</p> <p>Commitment of local stakeholders to global biodiversity conservation objectives.</p>
<b>GEF Operational Program:</b>			

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<p><b>Project Development Objective:</b></p> <p>Adoption of sustainable natural resource management practices and alleviation of rural poverty in mountainous areas of Armenia where degradation of natural resources is now reaching a critical point.</p> <p><i>Global environmental objective:</i> Protect and enhance the unique mountain, forest and grassland ecosystems and habitats of Armenia in the Southern Caucasus ecosystem, which host regionally and globally important biodiversity.</p>	<p><b>Outcome / Impact Indicators:</b></p> <p>Increase in income (or expenditure) in project villages compared to non-project villages;</p> <p>Increased crop and livestock productivity in project villages compared to non-project villages;</p> <p>Increased community participation in natural resources management decisions, as perceived by stakeholders in target communities;</p> <p>Reduction in illegal activities destroying forest cover;</p> <p>Reversal of degradation in pasture vegetation cover;</p> <p>Increased quality, quantity and productivity of forest cover in the project area</p> <p>Development of protected areas management plans for Lake Sevan National Park and Dilijan Nature Reserve- supported by local communities, adopted by Government, implemented in year two, and made subject to annual reviews; and</p> <p>Stable or increasing numbers of key indicator species according to population censuses taken in two of the last four years of the project.</p>	<p><b>Project reports:</b></p> <p>State statistical reports</p> <p>Project Progress Reports, Supervision Reports.</p> <p>Hayantar records.</p> <p>Household baseline surveys at mid-term and project completion.</p> <p>Perception survey of village participants verified by biological surveys.</p>	<p><b>(from Objective to Goal)</b></p> <p>Key stakeholders will consent to new management approaches.</p> <p>Pace of legal reforms sustained</p> <p>Community needs in correspondence with government interest.</p> <p>Communities subscribe to project objectives and willing to participate in project implementation, and in monitoring and evaluation surveys.</p>
<b>Global Objective:</b>			

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<b>Output from each Component:</b> <b>A. Community Based Watershed Management.</b>  (1) Village micro-catchment (MC) plans implemented, including: <ul style="list-style-type: none"> <li>establishment of multipurpose trees, agro-forestry on field boundaries and forest margins;</li> <li>stabilization and rehabilitation of active gullies;</li> <li>rehabilitation of hay meadows;</li> <li>sustainable management of community forests and high pastures;</li> <li>adoption of improved agricultural practices;</li> <li>rural infrastructure improvement.</li> </ul> (2) Community capacity for sustainable use of common resources developed. <ul style="list-style-type: none"> <li>Community forest and pasture management plans implemented.</li> </ul> (3) Measures for effective protection of mountain biodiversity at watershed level effectively implemented through: <ul style="list-style-type: none"> <li>Improvement and rehabilitation of existing hay meadows;</li> <li>enrichment planting and sustainable harvesting of non-wood forest products;</li> <li>effective measures for preservation beech and oak forest systems.</li> </ul> (4) Income opportunities of rural communities increased.	<b>Output Indicators:</b>  Community MC plans and annual investment programs developed and funded (up to 40 MC plans and 100 villages);  Reintroduction of forage legumes into crop rotation (1,500 ha covered);  Field roads rehabilitation completed in 800 km;  1,500 ha new plantations of multipurpose shrubs and trees in project area;  Number of watering points established in community pastures in project sites (up to 200 units);  Increased awareness of forest conservation needs [up to 1,000 families involved in reforestation and enrichment of planting];  Community participation in forest grazing increased [# of forest user groups]; [X] ha areas community forests (specify locations).  Increased vegetation cover and species diversity  [Number] of projects for effective biodiversity conservation funded under Small Grants Scheme in the selected watersheds  Surplus production increased (income\expenditure pattern based on baseline consumption basket).	<b>Project reports:</b>  Project progress reports  Land monitoring surveys  Socio-economic survey, project reports and reports from nurseries and extension and monitoring unit  Forest management plans  Benchmarks against international forest certification standards  Annual audited project accounts  Bank mission reports/Project mid-term report  Baseline surveys, annual surveys.  Participatory Monitoring Reports.  Forest management survey of villages.  Perception survey of village participants and MoA, MoNP staff.  Biodiversity monitoring reports  Project Implementation Consultant quarterly progress report.  Interim socio-economic survey, project reports.  End-of-project social assessment.	<b>(from Outputs to Objective)</b>  Appropriate enabling environment is created to allow community forest management.  Staff and workforce available & trained  Decentralization leads to improved management of environmental and natural resources.  Micro-catchment plans completed and resources allocated for implementation effectively and efficiently used.  Local communities honor their commitment to implement all project activities identified in trade-off matrix.  Timely availability of extension and TA support services (e.g., technology, knowledge dissemination).  Appropriate enabling environment is created to allow forest management.  General public aware of need to conserve biodiversity.  Local workforce available and trained.  Adequate response to workfare

		[Number] of poor employed in the community/workfare/programs in project area.	Progress reports/PIU spot checks and community sub-project and community sub-project and implementation report.	programs.  Community commitment for funding of recurrent costs.
<b>B. Improved Management of State Forests.</b>  Sustainable forest management practiced in selected pilot areas on state forest land.		Sustainable forest management practices adopted in forest units the two project areas by mid-term.  [Number ] of forest management plans prepared in the project area by mid-term.  Wood volume increment (measured on permanent sample plots) and increment/legal harvest ratio [%].  Area of forests under improved management [% of forest area with forest management plans and area under pre-commercial thinning].	Hayantar annual reports  Project progress reports  Legislation by-laws  Reports from nurseries.  Forest/pasture management plans.  Benchmark against international certification standards.  Hayantar annual reports  Project progress reports	Commitment to fight illegal cutting/logging & combat corruption and release information.  Appreciation of transparency.  Hayantar in consent with project objectives.
<ul style="list-style-type: none"> <li>● Technical assistance for effective forest management delivered to Hayantar district branches, Department of Protected Areas, local environmental authorities and communities.</li> </ul>		Establish interministerial task force on illegal logging December 31, 2002.  Establish a system for registering and monitoring illegal logging by mid-term.  Number of illegal logging cases reduced by mid-term (2005).  Draft regulation on procedures for community forests submitted to National Assembly by September 1, 2004.	Reports on illegal logging activities.  Reports on land use.	
<b>C. Improved Management of Project Protected Areas</b>  (1) Effective management of		Number of forest staff trained [X] by mid-term ; [Y] by project end in two districts and Hayantar head office.		

Dilijan Reserve and Lake Sevan Parks.	Legal and regulatory changes implemented to facilitate boundary and zoning changes in protected areas, revenue retention and stronger role regarding development of economic activity within protected areas by mid term.		
(2) Enhanced planning and management capacity of protected areas and increased public awareness.	<p>Conversion of two paper parks into functional and well managed protected areas.</p> <p>Adopt management plans for Dilijan Reserve and Lake Sevan Park in year 2 of project and implement is subsequent 4 years.</p> <p>Areas of important biodiversity in buffer areas outside the two PAs identified by mid-term.</p> <p>Upgrade PA facilities and remove defunct structures by end of project.</p> <p>Measurable reduction of illegal resource use in the two PAs.</p> <p>Bio and landscape monitoring system (GIS) established in the two parks.</p> <p>Training assessment needs carried out and targeted training of DLBP of MONP and PA staff delivered by year 3.</p> <p>Adequate staffing of Dilijan and Sevan park administration.</p> <p>Park rangers services established and training delivered to [# of rangers].</p>	<p>Laws/regulations//GOA decrees</p> <p>Records of public consultations</p> <p>Project progress reports</p> <p>Protected areas law and regulations</p> <p>Project progress reports</p> <p>Field surveys</p> <p>Thematic GIS maps for both PAs.</p>	<p>Consensus on national biodiversity objectives.</p> <p>Quality proposals for grant funding.</p>
<b>D. Efficient Project Management</b>			
<ul style="list-style-type: none"> <li>provide support to project administration and in project activity implementation.</li> <li>provide support in areas of financial management training, project audit, capacity building etc.</li> </ul>	<p># of micro-catchment plans prepared and agreed;</p> <p>Contracts with local service providers for implementation assistance signed.</p> <p>Organizational and functional structure established prior to project effectiveness;</p>	<p>PIU progress reports, including disbursements and procurement reports.</p> <p>Project progress and supervision report.</p> <p>Project audits.</p>	<p>PIU records are maintained in transparent manner.</p> <p>Project staff is competent and dedicated.</p> <p>Sufficient counterpart funds available through project life.</p>

	<p>Operational manual approved by PMB;</p> <p>PIU office secured and equipment procured;</p> <p>PIU staffing completed by effectiveness;</p> <p>FM and project management system in place;</p> <p>Staff training provided;</p> <p>Counterpart annual budget allocations transferred to the Project Treasury Account</p>	Project account disbursement reports.	Selection of project sites according to agreed criteria.
--	---	---------------------------------------	--



Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<b>Project Components / Sub-components:</b> A. Community based Watershed Management B. State Forest Management C. Protected Areas Management and Biodiversity Conservation  D. Project Management and Coordination <b>Total Project Cost</b>	<b>Inputs: (budget for each component)</b> US\$6.4 million  US\$4.8 million US\$3.6 million  US\$1.2 million US\$ 16.0 million	<b>Project reports:</b>  See below.  See below. See below.  See below.  Annual monitoring reports including financial monitoring and disbursement report.  Contracts, training and performance evaluation.  Management and financial reports, procurement records, contracts, audits, evaluation reports. Project launch Workshop Report. Bank supervision mission reports. Mid-term review. Implementation Completion Report.	<b>(from Components to Outputs)</b> See below.  See below. See below.  See below.  Strong support and commitment from local and national government agencies.  Timely availability of budgetary resources from GoA.  Implementation agencies have sufficient capacity to manage the project activities. Implementation agency and sectoral ministries are willing to cooperate effectively.  Highly qualified counterpart staff can be assigned to work on a full-term basis.  Sufficient interest in local communities/villages to participate in project activities.  Adequate cost-sharing arrangements with project beneficiaries established.  Adequate implementation of the participatory approach.

## **Annex 2: Detailed Project Description**

### **ARMENIA: Natural Resources Management and Poverty Reduction Project**

#### *Project development objective:*

The project development objective is to promote sustainable natural resource management practices and to alleviate rural poverty in degraded hilly and mountainous areas of Northern Armenia. The project will help prevent further deterioration of natural resource base (soil, water, forest, fishery, and biodiversity) and stabilize the local incomes. The global environmental objective of the proposed project is to protect and enhance the unique mountain, forest, and grassland ecosystems in the project area, including their habitats which host regionally and globally important biodiversity and endemism in Southern Caucasus, with a focus on strengthening of in-situ management of project protected areas.

#### *Project area and context:*

Gegharkunik is 4,055 sq. km, of which 1,500 sq. km. is Lake Sevan National Park. The altitude ranges from 2,000 to 3,500 m and the population is 277,000, of which 84% are rural. Tavoush is 2,688 sq. km, of which 290 sq. km. is Dilijan State Preserve. The altitude ranges from 400 to 2,800 m and the population is 156,000, of which 79 percent are rural. A sample of rural villages in the two marza indicates that the incidence of poverty is much higher than the national average for rural areas.

The project integrates environmental and social concerns into the management of upper watersheds and will help restore forest, range and farming activities. It offers incentives for adoption of sustainable practices which are expected to reduce pressures on environmentally sensitive areas in selected watersheds located in Gegharkunik and Tavoush Marzes. A watershed in the context of this project is the geographical landscape that feeds the water to a drainage line and from which area communities living within it make their living, dependent on the local natural resources. During preparation eight watersheds have been selected, including nineteen villages that will start the implementation of project activities during the first two years. These are the following: Gegharkunik marza: Maipor Getik, Antaramedj (Tchambarak), Dzoragyugh-Tzakkar and Gavar; Tavoush marza: Gosh (Ijevan), Polad Getik, Koghb (Noyemberyan), Hakum. Identification and selection of additional watersheds will start during the second year of implementation and based on agreed selection criteria.

More specifically, the project will: (a) develop and implement participatory micro-catchment plans in selected local communities; (b) support implementation of on-site technical packages that would promote sustainable management and conservation of biodiversity and natural resources while generating economic benefits to local communities; and (c) strengthen the capacity of local institutions responsible for natural resources management and moderate conflicts between various resource users.

Project components are inextricably linked with one another inasmuch as they have the same overall objective and are based on an integrated watershed approach. Sustainable farming and grazing practices resulting in increased crop and livestock productivity, together with income generating opportunities and improved forest management, will result in alleviation of rural poverty in project locations and eventually lead to enhancement and preservation of the natural resource base and to improved species biodiversity. The forest management and biodiversity conservation are part and parcel of watershed management and as such are contributing to the integrated ecosystems approach taken by the project.

#### **Project components**

The project has four components: (i) Community Based Watershed Management; (ii) State Forest

Management; (iii) Protected Areas Management and Biodiversity Conservation. Provisions for project management and coordination between the “content” components and actors involved in their implementation are included in component four "Project management". The project is expected to finance civil works, equipment and materials, training and technical assistance services to implement the project components.

#### **By Component:**

##### **Project Component 1 - US\$6.40 million**

**Community-based Watershed Management.** Component 1 focuses on the rehabilitation, conservation and management of natural resources through sustainable management of agricultural land for crop production and sustainable management of community pastures and hay meadows for increased livestock production.

A demand driven “Menu of Options” outlines the project’s activity mandate, from which participating communities will develop micro-catchment plans which will be complemented with special forest and pasture management plans. The micro-catchment plans will set out a program of activities that meet village needs and overlap with the project mandate. The plans will be negotiated with participating communities, and a framework agreement formalized for implementation by Resource User Associations under the Village Council. When choosing menu activities participants will be encouraged to balance both resource use activities that generate short-term direct benefits, and forest and watershed resource management activities, which generate long-term public / private benefits. Demonstration activities aim to improve general knowledge and skills and to demonstrate joint production and sustainable resource use and conservation benefits. Following consultation with stakeholders in the two Marzes, the following activities are included in the “Menu of Options”:

**1.1: Community forest management.** On a pilot basis the project will support community forest management and agro-forestry interventions that complement Component 2 (Management of State Forests). Access to grants for inputs and local technical support would be conditional on completion of community forest management plans and organization of a Resource User’s Association under the Village Council by participating families. The specific activities identified in the menu of options will include the following technical interventions that are eligible for funding:

- (a) reforestation, afforestation and rehabilitation of forests (underplanting);
- (b) forest protection against fire, insects and animals
- (c) thinning and tending of forests
- (d) regeneration of forests, especially by applying natural regeneration methods

The specific activities identified will include the following technical interventions that are eligible for funding:

(a) *Plantation of multipurpose shrubs and trees* (up to 1500 ha.). Reforestation of degraded community land areas with local and adapted tree species or with multi-purpose fuelwood species, such as Robinia (*Robina pseudoacacia*), honey locust (*Gleditsea triacanthos*), poplar, and native softwood species. Improvement of shrub and degraded beech vegetation through coppicing and temporary protection from grazing livestock (using exclusion by agreement in the grazing management plans developed by community participants). Trees will be planted around edges of arable fields and contours, particularly on slope lands, to manage landslides, reduce soil run-off and erosion, and provide coppice fuelwood. Outcomes include: improved on-farm soil conservation and increased crop productivity; erosion control and reduced downstream sedimentation and run-off; increased fuelwood supply and reduced pressures on native forests;

diversification of farm incomes (e.g honey source for bee keeping, etc.). Inputs funded by the project include: materials (seedlings and seasonal inputs),; and locally provided technical assistance (technical support, awareness raising and training).

*(b) Enrichment planting and sustainable use of non-wood forest products (berries, fruits and mushrooms) (up to 25 families per watershed equivalent to a total of 5,000 ha).* Enrichment planting of indigenous understorey species in community forests including blackberry, raspberry, plum, pear and rosehip. Technical support to communities would come from local technical service providers who would also oversee maintenance of plantings by participating families. Outcomes include: increased abundance of productive understorey species in natural forests, opportunities for non –destructive harvesting of non-wood forest products, and income generation incentives for conservation of the forest environment, which is currently under heavy pressure. Inputs include: materials (seeds and seedlings) and local technical assistance (awareness and training). The community is expected to contribute labor for planting and maintenance of seedlings in return for the exclusive right to harvest fruit and berries from their plantings.

*(c) Demonstration of Biogas production system (up to 100 demonstration units).* The activity provides an opportunity for generation of methane gas from animal manure to be used for household cooking and heating before returning nutrients to the soil. This technology has already been successfully demonstrated in other areas of Armenia and is a proven alternative to using dung as fuel. Contractors working with beneficiaries to construct and manage use of household biogas digesters will use standard adapted designs. Outcomes include: alternative energy from livestock production at farm level; development of energy substitute for fuel wood and reduced pressures on forests; organic fertilizer as residue for crop production; and improved indoor environment. Inputs include: equipment and materials and technical assistance (standard designs, construction supervision and training in use and management of digester).

**1.2: Community small-grant for biodiversity conservation.** Participating communities will be eligible for financial assistance (maximum \$5,000) to support local initiatives which benefit biodiversity conservation either directly or indirectly by supporting local livelihoods that reduce pressure on the protected areas and biological resources. Activities such as, but not limited to, plantation of multipurpose bush and trees, enrichment planting and sustainable use of non-wood forest products will be eligible for financing. Community projects financed by the grant program will be developed and implemented by local communities as part of watershed management plans – thus integrating community elements of forestry and protected area management plans. NGOs and individuals living around the two protected areas would be eligible for specific biodiversity grants. The grant scheme will be implemented using the same service provider that is contracted to provide assistance to local communities under the watershed management component (Component 1). Outcomes include: increased abundance and conservation of threatened species and income generation from sustainable use activities consistent with the selection criteria. Inputs include: small grant applications, technical review, grant assistance and monitoring supervision.

**1.3: Community pasture management.** These menu options support sustainable livestock production while protecting globally significant high altitude pasture biodiversity – much of which is the origin of globally significant pasture species used in agriculture. Activities will support management of natural pastures in state forest lands and village lands as well as hay meadows owned by participating households. Access to grants for inputs and local technical support would be conditional on completion of grazing management plans and organization of a Resource Users' Association under the Village Council by participating families – thus ensuring that project supported interventions result in improved resource management and contribute to poverty alleviation. Technical description of specific interventions follows:

*(a) Construction of stock watering points in high summer pastures (estimated 200 units).* The project

will support will be provided for rehabilitation or construction of stock watering points to reduce grazing pressure around existing water points and spread the grazing pressure more evenly across the grazing resource. Standard designs for concrete troughs and hard stand with float valve and buried high density polyethylene pipe will be used. Labor from members of the Resource Users' Association used in construction would be paid for through project workfare programs. Outcomes include: improved utilization and productivity of pastures and provision of drinking water for animals; reduced grazing pressure on soils and vegetation currently located in watered areas; and improved livestock productivity. Inputs include: materials, works (community labor) and technical assistance. Pasture User's Associations are required to sign a maintenance agreement with the Marza Authorities as part of the procurement arrangements.

*(b) Sustainable management of community pastures (estimated 9,500 ha).* The project will support adoption of best practice management of natural pastures by participating communities. Pastures on village, state forest and state land are all eligible, with the management techniques, location and extent of interventions identified in grazing management plans. Management activities include fertilizer spreading on intensively grazed areas, rotational grazing, identification of zones from which grazing is excluded, and timing of grazing to allow establishment and flowering of palatable species. Grazing management plans will specify the locations for management interventions and start and finish dates for grazing. Communities are expected to enforce these regulations with self-regulating contractual mechanisms administered through the Village Council in return for grant funds. Outcomes include: rehabilitation and improvement of pasture ecosystems, restoration of herb: grass balance in treated pastures, conservation of biodiversity and species habitat for endemic flora and fauna; reduced soil erosion; introduction of improved grazing systems; and improved livestock productivity. Inputs include: materials (fertilizer program for 3 years), works (equipment hire) and local technical support (extension, training, demonstration activities).

*(c) Improvement and rehabilitation of village hay meadows (estimated 3,300 ha.).* Project support will be provided for rejuvenation of native hay meadows using best practice harvesting and fertilizer regimes. Demonstrations will be used to improve hay nutrition, cutting and management techniques. Outputs include: improvement of the productivity of hay meadows and conservation of meadow biodiversity and species habitat; creation of the improved forage supply required for shed-feeding in winter; and improved livestock productivity. These outputs are essential to enable delayed commencement of spring grazing, which in turn reduces pressure on spring pasture growth, and soil resources during snow melt. Inputs include: materials (phosphorus, nitrogen and potassium fertilizers as well as lime where needed), and technical support (extension, training, demonstration activities). Communities are expected to contribute their labor in return for access to project inputs.

*(d) Re-introduction of forage legumes into crop rotations (estimated 1,500 ha.).* Grazing management plans focus on management of soil resources and watershed forage balance by production of cultivated fodder in rotation with cereals. The project will support re-introduction of the following proven crop rotation system: alfalfa, vetch or sainfoin (3 years), winter wheat (1 year) and potato (1 year). Outcomes include: improvement of fodder base and winter feed supply, which would increase the shed-feeding period and reduce pressures on pastures in early spring and late fall; increased livestock productivity; land improvement through crop rotation, which will reduce dependence on mineral fertilizer and reduce the incidence of soil-borne diseases. Inputs include: materials (seeds of local alfalfa, vetch or sainfoin provenances, phosphate fertilizers), works (equipment hire for land preparation), and local technical support (extension, training, demonstration activities). Communities are expected to contribute their labor for all crop management activities in return for access to project resources on their land.

**1.4: Sustainable agricultural practices.** These menu options are designed to increase local knowledge and skills by demonstrating livelihood improvement opportunities through improved productivity and

diversification of farm production systems. Support will be provided to enable participating communities in remote areas to access extension and technical support from contracted extension service and training providers in the two marzes to demonstrate and promote adoption of best management practices. Access to grants for demonstrations and local technical support would be conditional on completion of watershed management plans under the Village Council – thus ensuring that the demonstrations have positive natural resource management and poverty alleviation outcomes. Technical description of the specific activities includes:

*(a) Demonstration and training for sustainable production of rainfed winter wheat and spring barley (estimated 2,000 ha).* Demonstrate proper farm practices, such as seed selection and treatment, land preparation and cultivation and plant disease control. In addition, demonstrations would introduce crop rotation, particularly with forage legumes, which will help to improve soil fertility and extend the sustainable use of formally cropped land. Outcomes include: improved food security and income from farming activities; reduced soil erosion and land degradation caused by poor land use practices. Inputs include: materials (seeds, fertilizers), works (equipment hire for ploughing and harvest); and local technical support (extension, training, demonstration activities). Communities are expected to contribute their labor for all crop management activities in return for access to project resources on their land.

*(b) Demonstration and training in sustainable irrigation management (estimate for 75 villages)* The activity will be implemented in collaboration with the on-farm irrigation rehabilitation and Water Users' Associations capacity building activities implemented by the IFAD financed Agricultural Services Project. Agreement has been reached with IFAD for their collaboration in village selection and watershed management planning to reduce the risks of community confusion. The NRMPR project will support community labor required to implement IFAD-financed capital works in collaboration with Village Councils and water user associations. Outcomes include: improved water conservation and land productivity; improved crop yields; reduced crop yield variability; diversification of farm production systems.

*(c) Bee keeping for comb honey production (estimate 1,500 bee hives).* Where pasture user's associations develop grazing management plans that require reduction of stock numbers, affected families will be offered the opportunity to develop an alternative livelihood from bee keeping for comb honey. The project will support provision of bee hives and required equipment for families that give up grazing livestock (up to 4 hives per family). The focus of bee keeping will be leguminous pasture species endemic to the region and leguminous forage crops. The grant funds will be provided to demonstrate implementation of best management practice bee keeping. Outcomes include: income generation opportunities; pollination of pasture legumes, forage crops and fruit trees. Inputs include: materials and local technical support (extension, best practice manuals, post-harvest handling, and marketing support) and local labor from participants.

*(d) Demonstration and training for sustainable cattle and sheep production (estimate for 100 villages).* To complement the community pasture management sub-component, the project will support demonstration of proper sanitation and feeding regimes, veterinary control, improved livestock shelters, combination of shed and pasture feeding, and post harvest handling and storage. Activity implementation will require certain commitments and change in management practices from communities, including enforcement of livestock carrying capacities and adoption of improved pasture and grazing management methods as identified in grazing management plans developed under the project. The project will not support increased livestock numbers – the focus being on increased productivity of existing livestock resources. The project will collaborate with USDA financed agricultural marketing program, which supports small, medium and large-scale milk processing enterprises in the project areas. Outcomes include: improved farm income from

livestock production. Inputs include: materials and technical assistance (demonstrations and training). Communities are expected to contribute their labor in return for access to technical support and extension demonstrations with their livestock.

**1.5: Community infrastructure and income generation.** These menu options are designed to support restoration of community infrastructure and natural assets that are directly linked with natural resource management. Technical description of specific activities follows:

*(a) Restoration of existing field tracks (estimate 500 culverts and 800 km).* The project will support community activities to improve access to remote fields, pastures and meadows that were formally used. Community labor and equipment hire required to restore field tracks would be financed for communities that have completed an approved watershed management plan. Outcomes include: improved accessibility of under utilized fields, mountainous pastures and meadows through rehabilitation of field tracks. Inputs include: materials; civil works (culverts and community labor); and local technical support (standard designs, permitting, contractor supervision).

*(b) Stabilization of areas at risk from land slides and rehabilitation of gullies to control erosion (estimate 500 gullies and 660 land-slide sites).* The project will support construction and placement of gabions for gully erosion control where this is approved as part of a watershed management plan. The activity will be carried out, to the extent possible, in conjunction with restoration of field tracks. Outcomes include: reduced gully erosion through combination of construction and rehabilitation measures; reduced the watershed-scale sediment yield. Inputs include: materials; civil works (community labor); and local technical support (standard designs, permitting, contractor supervision)

*(c) Rehabilitation of community forest access roads (estimate 30km).* The project will provide funds for labor hire and supervision to rehabilitate degraded and eroding roads that provide access to community forests for implementation of reforestation and forest rehabilitation activities (1.1). Outcomes include: reduced erosion, increased management efficiency in community forests and access for forest maintenance and protection. Inputs include: materials; civil works (community workfare); and local technical support (standard designs, permitting, contractor supervision).

**1.6: Development of community institutions and planning.** The project will support establishment and strengthening of watershed and community based institutions that will be responsible for developing and implementing watershed management plans and grazing management plans. Technical assistance support will be provided for activities which include:

*(a) Watershed management planning (estimate 40 watersheds and 100 villages).* Marza-level technical and participatory planning staff engaged by the PIU ( Component 4) will work with Village Councils, Resource Users' Associations and project beneficiaries to prepare comprehensive watershed management plans using the process outlined in the PIP. Project resources are provided for transport, data acquisition and analysis, field work and supplies for participatory processes. In addition, resources are provided for map and report translation and production.

*(b) Community forest management (estimate for 14 watersheds).* Marza-level technical and participatory planning staff engaged by the PIU (Component 4) will work with Hyantar, Village Councils, Resource Users' Associations and project beneficiaries to prepare comprehensive community forest management plans using the process outlined in the PIP. Project resources are provided for transport, data acquisition and analysis, field work and supplies for participatory processes. In addition resources are provided for map and report translation and production.



*(c) Establishment of Resource Users' Associations (100 villages).* Informal and voluntary Resource Users' Associations will be established for those community members who use grazing, community forest and irrigation resources. They would be developed under the Village Council with support from Marza-level participatory planning staff and service providers engaged by the PIU (Component 4). Their role would be to coordinate and self-regulate use of community grazing, forest and irrigation water resources. Project assistance will be provided for these associations in the early stages of implementation to lead the planning and implementation of the natural resource base and implementation of project activities. This will include training of the village staff and members of local administrative bodies.

*(d) Strengthening the capacity of existing organizations (100 villages).* Project assistance will be provided for existing village organizations in the early stages of implementation to lead the planning and implementation activities. This will include training of the village staff and members of local administrative bodies. Capacity building for Water User Associations, required by law for irrigation activities, would be provided by the IFAD financed Agricultural Services Project in a coordinated and collaborative way to ensure consistency and effectiveness. Various seminars will be arranged at watershed, community or user group level, adjusted to the specific local needs.

*(e) Community awareness (100 villages).* The project will support environmental awareness and sustainable natural resources management, as well as general project approach and its development objectives, through training programs which will be undertaken in each watershed during the initial stages of project implementation. Attendance at training will be a prerequisite for individuals and resource users' associations that wish to participate in project activities.

*(f) Local technical support for implementation and facilitation (estimate for 100 villages).* Local technical support will be provided to enhance the capacity of Village Councils and Marza Environment Director's to manage natural resources and implement project activities. Technical service providers will be contracted to provide these services using local competitive bidding. Existing Agricultural Support Centers, private sector specialists, research institutions, and NGOs already exist to compete for delivery of these services.

## **Project Component 2 - US\$4.78 million**

**Management of State Forests.** The objective of Component 2 is to increase social, economic, environmental and global biodiversity benefits by rehabilitating and sustainably managing degraded state forests. In line with the project development objective this component will assist the Ministry of Nature Protection and the Hyantar in addressing and curbing ongoing degradation of Armenian state forests in the project area. The specific outcomes of this component is (1) establishing and implementing a system for sustainable forest management on selected pilot areas in the project area; and (2) develop the legal, institutional, policy framework and human capacities for sustainable forest management and biodiversity conservation. The direct beneficiaries of this activity will be Hyantar, the Ministry of Nature Protection, FREC and village councils. Area covered by project activities includes state forests in Tavoush and Gegharkunik of about 140,000 hectares. In this context project support will focus on:

### **2.1: Demonstration of improved forest management practices.** This includes:

*(a) Resuming forest management planning* by developing new, improved forest management plans on about 70,000 hectares of State forests in Tavoush and Gergharkunik. Forest management plans will be based on new guidelines that will take account of non-wood economic aspects, forest ecological, biodiversity and social functions, and will be based on a participatory approach. Participation is critical to ensure integration and coherence of forest management plans with micro-catchment plans. Each forest

management plan will be based on a forest inventory [(US\$ 2.0/ ha base cost)]. Outcomes include: state forest management plans as a basis for sustainable harvesting in state forests. Risks associated with sustainable harvesting will be minimized through the safeguards for any funding of such actions.

(b) *Reforestation of over-logged and scarcely stocked stands and afforestation of blanks* by supporting complementary regeneration (reforestation by plantation or direct seeding). Reforestation will be based on using autochthon and locally adapted tree species. Reforestation and rehabilitation of forests will be executed on an area of about 1,100 hectares in areas of high forests where natural regeneration has partially or totally failed (production forests), and where degraded forests are located on highly erosive (steep slopes etc). The activity would include rehabilitation and expansion of nurseries [ca. US\$... base cost]. Reforestation activities would be agreed with IDA during the review of the annual project work program and budget. Inputs include local labor for implementing reforestation and rehabilitation activities to maintain the growing stock at a level which is economically, ecologically and socially sustainable.

(c) *Pre-commercial thinning and thinning of pole stands* would be undertaken on 1,000 hectares for the purpose of improving the stability of young beech, oak and pine regeneration as well as to improve growth and form remaining trees. Outcomes include: improved forest health, reduced fire and pest risks, increased yields of fuel wood for populations. Inputs include: equipment and local labor

(d) *Regeneration of over-aged, partially disintegrating stands* would be undertaken in production forests in the remote parts of the selected watersheds. Interventions would return over-aged, partly decaying beech/oak forests which are lacking increment and value into productive forest management by applying low impact harvesting techniques and sound silvicultural intervention methods (selective felling, group felling), leaving sensitive areas untouched for biodiversity, habitat protection reasons. Standing and fallen dead wood, hollow trees, old groves and special rare tree species left in quantities and distribution necessary to safeguard biological diversity. Outcomes include: improved forest health and growth by applying innovative methods for regeneration and low impact harvesting techniques, adoption of innovative methods for biodiversity conservation in state forests. Inputs include: local labor and equipment.

(e) *Rehabilitation of road network for implementation of forest management plans* would reduce severe erosion damages from uncontrolled accessing of forests, over-exploitation in easily accessible areas, reduce harvesting damages and costs and would allow modern silvicultural intervention techniques. Road rehabilitation would be undertaken on about 70 km in areas where new management plans exist; illegal logging is under control; specific sites detailed EIAs show favorable results and after Best Practice Manual with Guidelines to contractors are prepared and approved. Project funds would be used for the design and the implementation of rehabilitation and maintenance works. Such sites would be used for demonstration of low impact and environmentally friendly harvesting and extraction techniques. Outputs include: 70 km of road network rehabilitated. Inputs include: services, local labor, materials and equipment

(g) *Mitigation of risks from forest fires and insect attacks*. The project would provide assistance to improve fire prevention and fire fighting capacities in the project area. The support would include communication equipment, fire fighting tools (fire fighting gears, hand pumps and tools) and in case of insect attack would fund applications for integrated pest management.

(h) *Strengthen operational capacities of Hyantar, the Ministry of Nature Protection, FREC and village administrations involved in project operations*. Project funds will support capacity building in forest management and conservation of Hyantar's field services by providing improved office buildings, radio-communication, office and transportation equipment and funding of related operational costs. Civil works and goods and materials will be procured in implementing these activities. Maximum use would be

made of locally available work force in creating cash incomes for poor and unemployed rural people.

**2.2: Strengthening of legal, institutional, and policy framework ( SIDA US\$ 1.08 equivalent).**

Project support will focus on strengthening of the legal, institutional and human resources platform for implementation of sustainable forest management and biodiversity conservation. Technical assistance will be provided by SIDA to enable project implementation and build capacity in the Hyantar, FREC, Ministry of Nature Protection and Marzes and village councils. Technical assistance will engage primary stakeholders through training, consultations and in supporting change processes. Project funds would be used for work, organization of decision making processes, training, establishment of demonstration sites and procurement of demonstration equipment. This includes:

(a) *Improvement and adaptation of legal framework for sustainable forest management, biodiversity conservation and communal involvement.* The activity will focus mainly on the provisions in the forest law dealing with the definition of forests, afforestation on private land, communal forest management, short and long-term lease arrangements and forest planning. The project would be instrumental in completing outstanding regulatory framework (transfer of forests to communes, forest management plans, marketing and pricing, disease control, biodiversity protection, etc.), as needed for project implementation.

(b) *Development of a national forest policy, strategy and action program,* which translates legal obligations and overall national objectives in into action. The national forestry program would use the recommendations of the UN-Intergovernmental Forum on Forests as a reference document.

(c) *Re-defining the role and functions of the forest administration* to new requirements arising from the transition process. The project would assist in restructuring and reorganizing the structures of Hyantar and the forest authority in the Ministry of Nature Protection. Recommendations to Government on institutional responses to separation of commercial and administrative functions, involvement of communes as forest managers, decentralization of key functions, applying of participatory processes, measures for increasing efficiency and quality of forest administration etc would be prepared on the basis of analytical work provided through technical assistance. A key outcome of this process would be a thoroughly revised financial management and accounting system of Hyantar which would allow a clear distinction of commercial and administrative tasks. The process would lead to a phased and costed implementation plan for the forest sector reform which would be funded by the project.

(d) *Introduce innovative marketing and pricing methods* through developing market economy skills for bidding, contracting marketing, financial management and involvement of the private sector. Project activities would lead to improved financial viability, improved re-financing of the forestry sector and reduced corruption through improved transparency by applying modern information management systems.

(e) *Assistance to the Government's program against illegal logging and corruption.* The project would be instrumental in undertaking analytical and independent analysis and monitoring of the state of illegal logging and corruption in the forest sector, in developing mitigation plans and in building capacities of an independent forest inspection service.

(f) *Develop human resources and implement training program for key forest stakeholders* (including private contractors) including participatory management and innovative planning methods. The project will finance training of forest staff on sustainable forest management methods and practices, forest management planning , marketing and pricing, financial management, silvicultural management, forest extension and communal forest management, IT-technologies and information management systems, governance. The project also will provide funds for awareness campaigns and study tours for key Hyantar and Ministry

professionals.

(g) *Rehabilitate Zikatar training demonstration center.* The project will finance the rehabilitation of the Zikatar site and provide the necessary equipment for demonstrating sustainable forest management on the 6,000 ha of experimental forests surrounding the center. It will also support the development of curricula and training of trainers. Funding would be dependent on presentation and acceptance of a viable long-term financing strategy of the center. The Zikatar center would offer additional capacities for environmental and biodiversity training purposes in Armenia.

(h) *Independent forest certification and auditing in a pilot area* (Zikatar experimental and demonstration forest). Project funds will be used for developing standards, management plan and implementation of all necessary steps for achieving recognition from and internationally recognized certification scheme, verified by an independent and accredited certifier. The Zikatar forest will be the national reference forest for sustainable forest management and will be used as a demonstration and training area for all Armenian foresters.

### **Project Component 3 - US\$ 3.67 million**

**Protected Areas Management and Biodiversity Conservation.** The project will support measures to: (i) improve the role of two key protected areas (Lake Sevan National Park and Dilijan State Reserve) in the conservation and sustainable use of the region's biodiversity, and sustain these improvements; (ii) improve the capacity of the central PA department to meet its biodiversity conservation mandate inside and outside protected areas, including through mainstreaming efforts in government policies and laws and activities of the line ministries and Marza governments. These biodiversity conservation investments are closely integrated with those being financed in the buffer zones of the protected areas and elsewhere in the project area watersheds, under Component 1 (Community Based Natural Resources Management) and Component 2 (Management of State Forests).

Two activities below will benefit from GEF funding. To promote greater integration between project components and extend biodiversity conservation outside the protected areas US\$250,000 in GEF funding for a small grants program will be delivered through the Community-based Watershed Management component and US\$175,500 through the Forestry Management Component.

**3.1. Improve the management of Dilijan Reserve and Sevan Park.** The project will support preparation and implementation of new management plans for Lake Sevan National Park and Dilijan Nature Reserve. The management plans would review and propose more effective boundaries and zoning based on sound scientific knowledge and updated baseline inventory and maps. For Dilijan, the management plan will guide the GOA decision over possible change in status. The planning process will acknowledge that protected area management plans are tools to address a wide variety of demands and values (biodiversity, human, cultural, socio-economic) while acknowledging the primary goal of conserving globally and nationally important biodiversity. Specific activities are:

(i) *Preparing participatory protected area management plans through:* assisting protected area management to establish appropriate planning teams; consultation with local and national stakeholders; developing an appropriate local institution for regular review of performance of plan implementation against targets.

(ii) *Developing monitoring systems and undertaking applied studies to inform improved management by:* species and ecosystem research to build baseline inventories for key biodiversity and habitat mapping; research on forest and range productivity; tourism development studies, visitor impact research, and visitor

surveys; research to facilitate local resource allocation and access, develop more efficient policies for benefit-sharing with local communities and increase revenues for sustainable financing of protected areas.

(iii) *Providing professional development and training for protected areas staff and local stakeholders by:* undertaking a detailed training needs assessment; implementing a phased training program to address priority needs; providing specialized training in priority subjects such as protected area management and planning, conservation and awareness, protection and enforcement, monitoring and visitor management; and organizing regional and overseas study tours to exchange knowledge on best practices in protected areas management.

(iv) *Delivering environmental education and public community programs to build local awareness of the protected area's multiple objectives and encourage participation of local communities in the project by:* planning and implementing appropriate approaches for community participation and outreach, and general awareness raising; producing relevant material to guide local conservation and sustainable use of bio-resources, eco-tourism, etc.

(v) *Establishing infrastructure and logistical support at Dilijan State Reserve and Lake Sevan National Park by:* strengthening transport, computer, monitoring, scientific and communication capacity in central offices, outlying field stations; providing uniforms and field and equipment; upgrading visitor/interpretation centers; and developing low-impact recreational facilities in appropriate zones.

**3.2. Build capacity in the MoNP to administer the system of protected areas and public awareness for biodiversity conservation:** The project will enhance the capacity of MoNP to deliver its national mandate for policy, planning, monitoring and enforcement, and resource allocation for the system of protected areas. Specific activities are:

(i) *Strengthening the capacity of the department of PAs to deliver its mandate for protected area policy, planning, monitoring and resource allocation by:* improving transport, computer, office equipment and national and international communication capability; providing appropriate training in protected area policy and planning (including study tours) for senior staff.

(ii) *Reforming key national and site-level legislation and regulations for protected areas and flora and fauna conservation by:* providing local and international specialists to work with the MoNP and Parliamentary committee on environment to review existing legislation and draft new laws and supporting regulations to strengthen roles and responsibilities of MoNP in protected area management and create effective mechanisms for revenue retention. This should include provisions for retaining of a reasonable and negotiated proportion of all revenues generated by protected areas, and any other appropriate financial mechanisms with safeguard of national budget revenues.

(iii) *Mainstreaming biodiversity conservation into the planning and policy processes of central and sectoral Ministries by:* implementing workshops with senior economic planners and policy analysts to increase their awareness of biodiversity conservation, and positive/negative linkages with national and sectoral policies and programs.

(iv) *Strengthening information dissemination by:* providing equipment and training for desktop publishing; supporting the production of material on protected areas, biodiversity conservation, and the project for mass media; supporting the publication of scientific research at the site level under the project in peer reviewed journals; establishing and maintaining a web site.

(v) *Undertake a rapid assessment for biodiversity conservation at the landscape level by:* establishing a small PC-based GIS in the MoNP for integrated resource information management and

mapping ( maps at least of scale 1:50,000); completing field studies and research; producing a report that identifies and maps biodiversity hotspots and critical corridor linkages, which warrant special protection. The GIS will require a mix of satellite imagery, aerial photographs and ground verification to be an effective supporting tool for site-management planning and implementation.

(vi) *Strengthen transboundary cooperation in biodiversity monitoring and protected areas management by:* joint training sessions for wardens and protected areas managers with the teams engaged in implementation of biodiversity projects in Georgia and Azerbaijan.

Communities located inside or in buffer zones adjacent to the protected areas will be eligible for financial assistance through Component 1- Community Based Forest Management (maximum \$5,000). Project grants supported by GEF financing will assist small-scale initiatives, which generate incremental benefits to globally significant biodiversity by supporting local livelihoods that reduce pressure on the protected areas and biological resources. Projects financed by the grant program will be developed and implemented by local communities, NGOs and individuals.

#### **Project Component 4 - US\$1.16 million**

**Project Coordination and Management.** The project will provide support to project administration and implementation, including 100% of specific items of the incremental operation cost of Project Implementation Unit. This includes essential technical assistance for financial management and procurement and other implementation targeted training of PIU staff, project audit, cost of field travel of PIU staff, bank charges, implementation assistance for institutional coordination and implementation assistance of communities, basic equipment and facilities for operation. The project implementation unit has been established in Yerevan within the Ministry for Nature Protection, which would have the responsibility for day- to- day management and coordination of project implementation, including monitoring, procurement, financial management, coordination of activities and reporting. The Government has established a Project Management Board which is in charge of overseeing project preparation and implementation. The PIU will operate on the basis of a Project Operational Manual, which will be prepared by the PIU and approved by the Project Management Board prior to project effectiveness. Establishing and maintaining the PIU with staff and functions satisfactory to the Bank will be another condition.

Two specialists, one responsible for technical coordination of activities, the other for planning and working with communities, would be staff of the PIU and located in each Marza. Marza PIU experts would work closely with communities and other stakeholders at local level. The PIU staff will be recruited competitively prior to project effectiveness. The project would provide basic logistical support and training to the Ministry and Marza PIU staff and village councils as needed to support implementation.

Administratively the PIU management will comprise PIU Director, financial management specialist and accountant, procurement and contract specialist, contract supervising engineer and sector professionals. Foreign and local consultant services will be provided for specific technical expertise, when needed. In many cases sufficient and appropriate skills to ensure successful project implementation are limited to the local expertise and experience. Therefore, it is particularly important that adequate training to PIU and other implementing agencies be provided first, for which project resources will be allocated. Organizational chart of the PIU is attached in PIP.





**Annex 3: Estimated Project Costs**  
**ARMENIA: Natural Resources Management and Poverty Reduction Project**

<b>Project Cost By Component</b>	<b>Local US \$million</b>	<b>Foreign US \$million</b>	<b>Total US \$million</b>
Community Based Watershed Management Component	4.50	1.18	5.68
State Forest Management	2.34	1.98	4.32
Protected Areas Management and Biodiversity Conservation	1.63	1.70	3.33
Project Management and Administration	0.67	0.37	1.04
<b>Total Baseline Cost</b>	9.14	5.23	14.37
<b>Physical Contingencies</b>	0.41	0.25	0.66
<b>Price Contingencies</b>	0.71	0.26	0.97
<b>Total Project Costs<sup>1</sup></b>	10.26	5.74	16.00
<b>Total Financing Required</b>	10.26	5.74	16.00

<b>Project Cost By Category</b>	<b>Local US \$million</b>	<b>Foreign US \$million</b>	<b>Total US \$million</b>
<b>Works</b>	4.53	1.83	6.36
<b>Goods</b>	0.57	1.99	2.56
<b>Consultants Services</b>	1.04	1.26	2.30
<b>Training, Workshops and Study Tours</b>	2.50	0.43	2.93
<b>Incremental Operating Costs</b>	0.95	0.23	1.18
<b>Recurrent Costs</b>	0.67	0.00	0.67
<b>Total Project Costs<sup>1</sup></b>	10.26	5.74	16.00
<b>Total Financing Required</b>	10.26	5.74	16.00

Figures may slightly differ due to rounding

<sup>1</sup> Identifiable taxes and duties are 0 (US\$m) and the total project cost, net of taxes, is 10.88 (US\$m). Therefore, the project cost sharing ratio is 76.34% of total project cost net of taxes.

## **Annex 4: Cost Benefit Analysis Summary**

### **ARMENIA: Natural Resources Management and Poverty Reduction Project**

#### **Background for economic analysis**

Watersheds in Armenia provide essential environmental benefits, such as soil and water retention flood control and hydrological services in downstream areas. These benefits have an economic value as they directly or indirectly affect several key sectors in the economy, principally agriculture, irrigation and hydropower generation. Improper use of land by local population and degradation of forest resources has led to serious environmental degradation in the form of soil erosion, with a consequent impact on water delivery potential of watersheds.

In addition to environmental costs, soil erosion has also direct economic consequences for local farmers, leading to depletion of soil fertility and declining crop yields. Farmers in project areas have partly offset the resulting loss of income by growing more erosive but in the short term more profitable crops such as potatoes. Other major contributors for soil loss are over-grazing in nearby pastures and degradation of nearby community forests.

The project improves 40 upper watersheds in forested and mountainous areas of Tavoush and Gegharkunik Marzes, which are degraded by widespread deforestation, overgrazing and inappropriate cultivation practices. These watersheds play an important role in providing water for agricultural production and hydropower generation in downstream areas. The project will address land degradation, forest destruction and poverty by: (a) increasing forest and vegetative cover; (b) supporting sustainable community forest management; (c) rehabilitating degraded pastures and increase fodder production; (d) increasing crop and livestock productivity through the promotion of conservation-oriented farm production systems; and (e) strengthening the capacity of local communities to continue implementation of sustainable land use practices.

#### **Summary of Benefits and Costs:**

The project addresses watershed development in a holistic way with an integrated set of interventions and mutually re-enforcing activities across different components. The economic and environmental benefits of these and most other measures can not be assessed individually but only in the context of the comprehensive watershed level analysis. For example, improvement of soil and water conservation on slopelands and reduction of sedimentation in downstream areas requires substantive changes in the way natural pastures and forests are managed. This, however, is only sustainable if proposed project investments into pasture improvement and forest rehabilitation will generate among long term environmental benefits short-term economic benefits to local communities.

An integrated cost-benefit analysis has been undertaken on all quantifiable economic and environmental benefits generated by the project. Table 1 summarizes main economic, environmental and social benefits of the project. It is expected, however, that non-quantifiable benefits, mainly environmental and social benefits, are likely to be several times larger than are the quantifiable economic benefits. The total benefits quantified in cost-benefit analysis should be thus interpreted as a conservative lower bound estimates.

<b>Activities</b>	<b>Economic Benefits</b>	<b>Environmental Benefits</b>
Community forest management:	<ul style="list-style-type: none"><li>• Income from sustainable</li></ul>	<ul style="list-style-type: none"><li>• Downstream water and</li></ul>

<ul style="list-style-type: none"> <li>• Tree planting</li> <li>• Forest rehabilitation</li> <li>• Plantation of multipurpose shrubs and trees</li> <li>• Enrichment planting</li> </ul>	<p>harvests of timber and fuelwood.</p> <ul style="list-style-type: none"> <li>• Income from sustainable use of non-timber products</li> <li>• Increased annual increment as a result of improved forest productivity.</li> <li>• Increased value of forests as a result of better management.</li> <li>• Reduced cost of forest management</li> <li>• Reduced forest losses from forest fires and pest attacks</li> </ul>	<p>sediment retention benefits.</p> <ul style="list-style-type: none"> <li>• Climatic benefits from carbon sequestration.</li> <li>• Conservation of globally important forest biodiversity.</li> <li>• Reduced forest losses from forest fires and pest attacks</li> <li>• Improved natural forest regeneration from pigs and acorns.</li> </ul>
<p>Community pasture management:</p> <ul style="list-style-type: none"> <li>• Construction of stock watering points</li> <li>• Sustainable management of community pastures</li> <li>• Improvement of hay meadows</li> <li>• Production of legume fodder crops</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect income through improved livestock productivity as a result of increased forage and fodder supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Downstream water and sediment retention benefits.</li> <li>• Conservation of globally important native grass and legume species.</li> <li>• Climatic benefits from carbon sequestration.</li> </ul>
<p>Sustainable Agricultural Practices:</p> <ul style="list-style-type: none"> <li>• Demonstrations for rainfed wheat and barley;</li> <li>• Demonstrations for bee keeping</li> <li>• Demonstrations and training for livestock production</li> </ul>	<ul style="list-style-type: none"> <li>• Income from increased crop yields.</li> <li>• Income from comb honey production.</li> <li>• Indirect income from improved livestock productivity.</li> </ul>	<ul style="list-style-type: none"> <li>• Downstream water and sediment retention benefits.</li> </ul>
<p>Community infrastructure and income generation:</p> <ul style="list-style-type: none"> <li>• Culverts from track rehabilitation;</li> <li>• Restoration of existing field tracks;</li> <li>• Stabilization of landslides;</li> <li>• Rehabilitation of gullies;</li> <li>• Rehabilitation of community forest roads</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced transportation and access costs.</li> <li>• Income from the previously unused crop lands (increase in cropping area).</li> <li>• Reduced risks of property loss from land slides.</li> </ul>	<ul style="list-style-type: none"> <li>• Downstream sediment retention benefits.</li> </ul>
<p>Demonstration of improved forest management practices:</p> <ul style="list-style-type: none"> <li>• Resuming forest management planning</li> <li>• Reforestation of over-logged and scarcely stocked stands and afforestation of blanks</li> <li>• Pre-commercial thinning and thinning of pole stands</li> <li>• Regeneration of over-aged, partially disintegrating stands</li> <li>• Rehabilitation of road network for implementation of</li> </ul>	<ul style="list-style-type: none"> <li>• Income from sustainable harvests of timber and fuelwood.</li> <li>• Income from sustainable use of non-timber products.</li> <li>• Increased annual increment as a result of improved forest productivity.</li> <li>• Increased value of forests as a result of better management.</li> <li>• Reduced cost of forest management.</li> <li>• Reduced forest losses from forest fires and pest attacks.</li> </ul>	<ul style="list-style-type: none"> <li>• Downstream water and sediment retention benefits.</li> <li>• Climatic benefits from carbon sequestration</li> <li>• Conservation of globally important forest biodiversity.</li> <li>• Reduced forest losses from forest fires and pest attacks.</li> </ul>

forest management plans <ul style="list-style-type: none"> <li>• Mitigation of risks from forest fires and insect attacks</li> <li>• Strengthen operational capacities of Hyantar, the Ministry of Nature Protection, FREC and village administrations involved in project operations.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced illegal harvests if timber.</li> <li>• Increased value of timber as a result of reduction of policy distortions and better marketing skills and improved work organization.</li> </ul>	
---	---	--

### **Analytical Approach:**

The economic analysis of the project focuses on the three major areas of quantifiable benefits. These are: (a) incremental production from of cereals and livestock products; (b) incremental forestry production; and (c) environmental benefits from reduced sediment retention and carbon sequestration from additional protection forest and rehabilitation of natural pasture vegetation. The economic analysis is based on 6-year project implementation period, and the following assumptions:

- (a) The period for evaluation of crop and livestock production activities is 20 years. For all other project activities the project life of 30 years is assumed;
- (b) Discount rate of 12% is used in the economic and financial analysis.
- (c) All benefit-cost calculations are carried out in constant prices ( 2000 base year) ;
- (d) Financial analysis is carried out using minimum wage rate of 1,000 AMD day. Given high unemployment in rural areas of Armenia the economic wage rate is 0.5 times the financial rates, or 500 AMD per day. An average project household is assumed to have 250 man days available per year, based on the assumption that family head and his spouse spend some 50 percent of their labor time on working in the farm. Therefore, it is reasonable to assume that sufficient labor can be obtained for project activities without jeopardizing the regular economic activities in the project area;
- (e) Most of the quantified economic benefits are derived using salable incremental output such as cereals, livestock products, comb honey, timber and fuelwood. Armenia is a net importer of cereals and timber; there is a growing domestic demand for livestock products, timber and fuelwood. Therefore it is reasonable to assume that incremental output is saleable; and
- (f) Import parity prices are calculated for important traded inputs such as fertilizer. The prices of outputs not traded internationally are based on field observations and interviews with producers in the project areas.

### **Evaluation of economic benefits**

#### *Crop and livestock production.*

To capture the mutual benefits and costs of different project measures, the economic analysis of sustainable agricultural and livestock production activities quantifies all inputs and outputs and estimate a net value of production for an entire project area. The estimated incremental benefit stream is derived from comparing the ‘without’ and the ‘with project’ net value of production. The ‘without project’ case assumes a continuation of present yields and productivity of livestock. The ‘with project’ case reflects the gradual improvements in yields and livestock productivity that will result from the project interventions. By-products and intermediate products used in the farming systems (i.e. manure, crop residuals, fodder, etc.) are valued only so far as they replace traded products. All other by-products are quantified as they mostly determine inter-dependence among agricultural activities at the watershed level. This is a preferable method as it avoids double-counting of benefits and valuation of problems for intermediate and by-products, and it integrates mutually beneficial interactions between the activities.

The project will improve productivity of 2,000 ha of winter wheat and barley. Current crop production in project areas is based on low input quantities over the last 8 years, which has led to gradual mining of soil nutrients. The project will provide local communities sustainable crop production packages which includes fertilizers, improved seeds and introduce more sustainable farming practices. As a result of these interventions the average yields of cereals is expected to increase some 25% from current average levels of 2,000 kg per ha, under normal weather conditions.

The area of cropland under production in project micro-catchments varies from 20 to 60 percent. The project will rehabilitate access roads and field tracks to more remote croplands which are currently prone to soil erosion. These investments reduce the cost of access which would bring some of these previously unused lands back into production. It is assumed that the land under crop production will increase in average 10% as a result of these investments. The benefits from these investments are evaluated through incremental crop output from increased cropland area.

Benefits from livestock production are evaluated through improved animal productivity as a result of rehabilitation of natural pastures and increased production of fodder. Animal productivity in project areas is far below the genetic potential of farm animals. The main reasons for the low animal productivity lie in poor feeding and nutrition, husbandry and management leading to low yields, long calving interval, long dry period (the period when milk is not produced); low fertility disposal and poor feeding of female calves. As a result, farmers seek to generate income by increasing the livestock numbers, which has led to further degradation of nearby natural pastures and community forests, while a large share of high elevation meadows remain underutilized.

The project will bring some 9,500 ha of community pastures under introduce sustainable grazing management, and finance construction of 200 stock watering points. Management activities include fertilizer spreading on intensively grazed areas, rotational grazing, identification of zones from which grazing is excluded, and timing of grazing to allow establishment and flowering of palatable species. In addition, the project will improve 3,300 ha of village hay meadows and re-introduce forage legumes into crop rotations on 1,500 ha. It is assumed that these investments are able to close the gap in feed deficit in the project watersheds, providing thus the basis for improved animal productivity.

The investments into improvement of pastoral resources and fodder production are treated as production costs associated with livestock production. It is assumed that overall livestock numbers will remain constant, while the average calving rates will increase by 10% (from current 50% to 60%) and lambing rate will increase by 15% (from 60% to 75%). It is assumed that the mortality rates will be reduced from 10 to 5 percent. It is assumed that the milk and wool yields and animal live weight remain constant. Increased meat and milk output is assumed to come from increased birth rates and take-off and larger share lactating animals. Economic and ecological sustainability of production activities will be achieved through adoption of sustainable grazing management practices, monitoring of the resource use, capacity building of local communities, and training and extension services to farm households.

The project will rehabilitate access roads and field tracks which would reduce the access cost to remote pastures and hay meadows. These investments provide significant environmental benefits as it is expected that local communities are more willing to move their livestock on remote mountain pastures mitigating thus grazing pressures on nearby grasslands and forests which are currently under heavy grazing pressures.

The project will provide investments for 1,500 bee hives as a alternative livelihood for households who are willing to give up grazing livestock (up to 4 hives per family). The focus of bee keeping will be leguminous pasture species endemic to the region and leguminous forage crops. It is assumed that comb honey

production will increase up to 25 percent during the project.

#### *Forest production.*

The project will plant 2,000 ha of currently tree-less lands, which were formerly under forests. Out of this area, 300 ha of land will be reforested in protected areas, 600 ha on communal lands and 1,100 ha in other areas. In addition, the project will rehabilitate 500 ha of existing forests in protected areas, 300 ha. of forest on communal lands and 1,000 ha in other areas over the 5 year period (i.e. pre-commercial thinning, enrichment planting, conversion of coppice to high forest, regeneration felling, and other operations). Calculation of benefits is carried out as following:

*Sustainable harvests of timber and fuelwood.* The value of timber harvests is determined based on the sustainable annual cut (SAC). The SAC is based on a long-term average increment of the timber from the total forest area in the project region, not on immediate increment of new forest plantations, which can be very low during the initial years. The economic analysis is based on assumption that plantation of additional forest would allow to increase SAC as the harvests will be carried out in the overmature forests with age class distribution towards the group of 100 – 180 year old trees. The sustainable timber harvest levels are thus based on natural increment from old productive forest stands. Sustainable timber harvest benefits are calculated by assuming that 75% of the gross increment can in the long run be taken out as utilizable yield, i.e. 2.4 m<sup>3</sup>/ha/year, which corresponds to the SAC.

*Improved forest productivity:* The benefits from forest rehabilitation activities (i.e. thinnings, coppice conversion, and regeneration felling) are two-fold. First, there will be immediate generation of additional wood of 10m<sup>3</sup> saleable sawlogs and fuelwood per ha. However, the main source of economic benefits is increased forest productivity as a result of increased usable incremental growth per hectare; reduced losses of wood from pests and forest fires; increased value of forest as a result of changes in tree composition towards higher value species. Additional productivity gains will be achieved through implementation of state and community forest management plans and procurement of modern forest management equipment. Modern equipment and better planning of forest management works will increase harvest efficiency and reduces wood losses. It is assumed that investments into forest rehabilitation and adoption of better management would increase the forest productivity by 20% per hectare. The capitalized value of improvement of forest productivity is calculated as US\$96 per ha. at the discount rate of 12%, based on timber and fuelwood production only. This is a very conservative estimate since it does not take into account the protective function of the forest, as well as the production of non-timber products.

*Increased value of timber:* Border/market prices were used to estimate benefits from wood timber and fuelwood production. In general 70% of the timber harvested in the project areas is beech, 20% oak and 10% of hornbeam, pine, lime and other species. The stumpage prices have been derived from the price of sawlogs on the roadside in Tavush Marza. While Armenia is net importer of wood, it is currently net exporter of beech logs. The value of quality beech logs has been derived from export prices at the Turkish border. For oak and other species domestic prices of sawlogs were used. Stumpage value of fuelwood was derived from the price of fuelwood in Yerevan.

Table below presents the assumptions made on border/market prices, economic prices and stumpage values for export quality beech logs, domestic saw logs and fuelwood per cubic meter in Tavoush Marza. The weighted stumpage value was derived assuming that export beech logs make up 17 percent from total harvests; domestic sawlogs of oak and other species make up 8 percent of total harvests and remaining 75 percent is sold as fuelwood.

	<b>Beech export sawlogs (US\$/m3)</b>	<b>Oak/other domestic sawlog (US\$/m3)</b>	<b>Fuel- Wood (US\$/m3)</b>
Border/market price	120	104	35
Transport to border	10	0	0
Transport to market	15	15	8
Additional equipment c	15	15	0
Transport to roadside	5	5	5
Logging	13	13	9
Transport to roadside	5	5	5

The increase in weighted timber and fuelwood price is expected to come from two sources. First, it is assumed that project interventions would reduce illegal logging and eliminate policy distortions which suppress domestic timber prices which would make the use of quality logs for fuelwood less attractive. The share of fuelwood from total wood harvests is assumed to decline from 75 percent to 65 percent, while the share of quality beech export logs and domestic saw logs is expected to increase to 23 and 12 percent respectively. As a result, the weighted stumpage price of timber is expected to increase from US\$24.8 per cubic meter to US\$27.6 per cubic meter. Secondly, it is assumed that timber prices will by 5 percent by year 6 as a result of the project. This timber price increase reflects better marketing skills of Hayantar and higher timber quality resulting from the application of modern harvesting technologies and better work organization.

*Reduced management costs:* The project will rehabilitate 71.5 km of existing forest roads in state and community forests. The forest rehabilitation will not only make the reforestation and the forest rehabilitation possible, but it would also reduce the costs of forest management. The benefits from forest road rehabilitation have been estimated by assuming that 20 m of road would serve 1 ha of forest. The cost of harvesting wood is estimated at US\$14 per cubic meter. It is assumed that the road rehabilitation would reduce this cost by 25% assuming sustainable harvest rate of timber 2.4 m3 per hectare. The true benefits of forest road rehabilitation, however, are much larger because they do not only serve to reduce the cost of harvesting, but also for forest protection (i.e. fire protection) and for forest management in general.

### **Economic valuation of environmental benefits.**

#### *Reduced sediment flows and improved water retention in downstream areas.*

The project will improve management of 9,500 ha of pastures and plant 2,000 ha of new forest and 1,500 ha of multi-purpose trees and shrubs, and implement gully erosion control measures. These investments are expected to generate improved watershed protection services from reduced soil erosion and sediment inflow to surface waters and structures in downstream agricultural and urban areas. Sedimentation reduces the quality of drinking water and aquatic ecosystems and causes choking of irrigation canals, which increases the operating and maintenance cost of irrigation systems. It has been estimated that some 60 percent of agricultural land in Armenia is affected by soil erosion. Specific information about the extent of soil loss in the project areas is missing, but it may be as high as 40 ton/hectare/year in some denuded areas. According to the NEAP, soil erosion is generally considered to be worst in forested areas which has a greater proportion of steep slopes and arid steppe areas where soils are less stable, both common landscape and ecosystem features in the project areas.

Other important watershed benefits come from improved water retention. For example, it has been



estimated that natural grasslands are capable of storing up to 80 to 90 percent of the rainfall in the soil, compared to 55 to 70 percent in forest lands. Rehabilitation of grassland vegetation cover through improved management activities would thus improve soil structure and soil water retention capacity, especially in the deep drainage level, controlling potential floods and improving water storage for downstream areas, mitigating the impact of drought periods.

It has been estimated that economic values of watershed protection services of forests range from of US \$7-20 per hectare for hydrological and ecosystem services within, and beyond, immediate project county boundaries. The figure of US\$10 per hectare of forest is used to evaluate watershed benefits from tree plantation and re-vegetation over 30 year period. It was assumed that rehabilitation of degraded community and state forests would generate half of the downstream watershed protection benefits compared to new tree plantations (i.e. US\$5 per ha per year). Watershed protection benefits from pasture rehabilitation and improved management are evaluated at US\$5 per ha/year, as their impact is more location specific compared to forests and depend largely on specific grazing management practices.

#### *Carbon sequestration.*

The project will plant 250 ha of new protective forests and 1,500 ha of multi-purpose trees and shrubs. Studies have shown that one hectare of forest cover is able to sequester between 6 and sequestration 16 tons of carbon annually. Carbon sequestration gives rise to important environmental benefits because carbon emissions result in climate change and associated damages. To be conservative the lower bound for carbon sequestration figures is used (i.e. 6 tons per ha per year). Rehabilitation of degraded forests is expected to fix incrementally 2 tons on carbon per ha/year. It is assumed that a carbon sink will be built starting from year 5 over the 30 year period up to 50 tons per hectare. Carbon sequestration benefits were calculated only for new protection forest and shrub plantations. Carbon sequestration benefits were not applied on plantation of production forests since wood harvests will release already fixed carbon.

Additional carbon sequestration benefits will be generated through rehabilitation and improved management of natural pastures. Grasslands and natural pastures are capable of fixing significant amounts of carbon in the soil and vegetation cover. It has been estimated that adoption of better management practices on the pastures would elicit a carbon gain of 0.1 – 0.5 Mg/ha/year or about 3 – 15 tons of carbon per year, depending on the degree of pasture degradation. To be conservative the lower bound for carbon sequestration figures is used (i.e. 3 tons per ha per year). It was assumed that carbon sink will build up starting from year 3 over 30 year period up to 50 tons per hectare.

The economic benefits of carbon sequestration were calculated using the shadow price of CO<sub>2</sub> damages at US \$20 per ton of CO<sub>2</sub> per year (discounted at 12 percent interest rate over the 20 year period), which is equivalent to US\$5.5 per ton of carbon. Various studies have estimated the net present value of damages associated with the release of a ton of carbon in ranged from US\$5 to 40. It is considered that the shadow price of carbon damages used here forms the conservative lower bound estimate of global benefits.

#### *Project costs.*

The project costs combine the production costs for community based natural resources management (i.e. agricultural and livestock production, bee keeping, forestry, agro-forestry, soil erosion control, etc.), community labor for implementation of MC plans, demonstrations and extension, and technical assistance services. The investment cost estimates of the State Forest Management Component include the cost of reforestation and forest rehabilitation (both community and state forests), road rehabilitation (state forests) and institutional strengthening activities, implementation of forest management plans, institutional capacity building (communities and government agencies), and procurement of vehicles and equipment.

## Results:

**Economic Rate of Return (ERR).** A cost-benefit analysis has been carried out for the Community Based Watershed Management Component and the Forest Management Component combined. Total economic rate (ERR) of the project is 20%. ERR based on economic benefits only is 16% (see table below). The total ERR of the Community Based Natural Resources Management component is 23%. ERR based on economic benefits only is 17%. The total ERR of the State Forest Management Component is 16%. ERR based on economic benefits only is 14%. Capitalized value of economic benefits is US\$8.5 million (discounted at 12% rate) or 90% of the total project benefits. The cost-benefit analysis does not quantify economic benefits from non-timber forest products, which can make up to 50% from the total economic value of standing forest stock. Capitalized value of environmental benefits quantified in economic analysis is US\$0.9 million or 10% from total benefits. This should be considered as a conservative lower bound estimate of total environmental benefits as it does not include many existence, option and bequest values associated with environmental resources. The economic analysis has not quantified any social benefits generated by the project.

	ERR economic benefits only	NPV economic benefits only (US\$)	ERR economic and environmental benefits	NPV economic and environ-mental benefits (US\$)
Community Based Natural Resources Management Component	17%	350,239	23%	1,287,125
State Forest Management Component	14%	139,972	16%	260,705
Total Project	16%	670,211	20%	1,547,830

**Financial rate of return (FRR).** Financial rate of return (FRR) has been calculated for 8 project micro catchments. FRR varies from 9 to 39%. The analysis shows that FRR is lower in communities, which have, in general, larger livestock numbers with limited pastoral and fodder resources (i.e. Dzoragyugh-Tsakkar and Koghb micro-catchments). FRR is generally higher in micro-catchments which have already relatively less degraded pastures and good potential to increase feed supply (i.e. Antarmedj-Getik, Miapor-Getik, and Polak-Getik micro-catchments). It should be noted that FRR presented here are only indicative as communities are free to choose specific project activities from the menu of options. The actual choice of activities and technical packages will be determined by the communities during project implementation based on the individual micro-catchment management plans.

Micro-catchment	FRR	FNPV
Antaramedj -Getik	22%	15,477
Dzoragyugh-Tsakkar	9%	-16,796
Gegharkunik	23%	52,745
Gosh	16%	7,708
Hakhum	12%	445
Koghb	9%	-7,261
Miapor-Getik	23%	32,703
Polat-Getik	23%	34,708

### Sensitivity Analysis:

A sensitivity analysis that the project returns are robust. Quantified economic benefits of project activities need to decline 20% in order for ERR drop below 12%. Variations in investment costs, incremental operating costs and economic benefits are presented below.

Scenario	ERR
10% increase of investment cost	18%
20% increase of investment cost	16%
10% increase of operating cost	18%
20% increase of operating cost	15%
10% decrease of quantified economic benefits	16%
20% decrease of quantified economic benefits	11.2%

### Fiscal Analysis:

The project will not have significant budgetary costs. It is expected that the project will generate economic surplus, which has a positive direct and non-direct fiscal effect. The major fiscal benefits of the project would come from increased land taxes, as a result of higher yields and improved crop productivity. According to the Armenia Tax Code the land tax is calculated at 15% of net income from land determined by the “cadastral” evaluation. The project will improve the crop production on 2,500 ha of agricultural land. It is estimated that this will increase the net incremental income from crop production activities to US\$140 thousand by year 6. The *potential* land tax revenue, which can be collected from these activities would be in average some US\$21,000 per year, or US\$72,000 over 6 years of project implementation period. It should be noticed that this is a conservative lower bound estimate of tax revenues from agricultural production, as it does not take into account the potential incremental tax revenues from increased livestock sales, and other indirect tax revenues the generated by the project (i.e. VAT, income tax, etc.).

Additional fiscal revenues would be generated through strengthening of Hayantar. Hayantar’s annual revenues, and resulting tax revenues, from timber and fuelwood sales could be increased some 15 times over a period of 10-15 years through institutional strengthening, elimination of policy distortions and controlling of illegal forest harvests. Last year Hayantar collected about 75% of its AMD 500 million budget from net forest revenues, i.e. about \$683,000. But the collectable amount is more like some US\$8m, or 12 times the present revenue assuming 215,000 m3 timber sales (half the sustainable annual cut of 430,000 m3/year).

The project would involve hiring contractual labor for community MC plans and forest plantation programs on a short-term basis, offering thus additional employment opportunities to surplus household labor. The Forest Management component is estimated to generate 1,269,000 labor-days over a project period of five years. It is expected that the employment opportunities generated under the project would reduce the dependence of some households from Government Paros payments.

**Table 3: Armenia: Natural Resources and Poverty Reduction Project. Economic Analysis Summary**

Year	Costs		Economic Benefits		Environmental Benefits			
	Investment	Operating	Total	Net	Sediment	Net Env.	Carbon	Net Env.
	Cost	Cost	Benefits	Benefits	retention	Benefits	sequestr.	Benefits
1	-592,594	-97,333	163,616	-526,311	0	-526,311	0	-526,311
2	-823,473	-316,333	419,851	-719,955	8,680	-711,275	0	-711,275
3	-790,667	-517,339	720,393	-587,613	25,710	-561,903	5,400	-556,503
4	-751,681	-658,721	979,755	-430,647	47,080	-383,567	5,400	-378,167
5	-777,522	-800,103	1,510,061	-67,564	67,280	-284	21,510	21,226
6	-381,636	-884,933	1,561,581	295,012	87,980	382,992	37,906	420,899
7		-884,933	1,552,696	667,763	100,000	767,763	56,708	824,471
8		-884,933	1,547,656	662,723	100,000	762,723	70,928	833,651
9		-884,933	1,542,406	657,473	100,000	757,473	78,259	835,732
10		-884,933	1,534,846	649,913	100,000	749,913	82,350	832,263
11		-884,933	1,527,286	642,353	100,000	742,353	84,805	827,158
12		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
13		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
14		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
15		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
16		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
17		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
18		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
19		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
20		-884,933	1,519,726	634,793	100,000	734,793	84,805	819,598
21			207,965	207,965	100,000	307,965	84,805	392,769
22			207,965	207,965	100,000	307,965	84,805	392,769
23			207,965	207,965	100,000	307,965	84,805	392,769
24			207,965	207,965	100,000	307,965	84,805	392,769
25			207,965	207,965	100,000	307,965	84,805	392,769
26			207,965	207,965	100,000	307,965	83,168	391,133
27			207,965	207,965	100,000	307,965	72,826	380,791
28			207,965	207,965	100,000	307,965	52,216	360,181
29			207,965	207,965	100,000	307,965	33,005	340,970
30			207,965	207,965	100,000	307,965	13,795	321,759
Share of benefits:			90%		6%		4%	
ERR (economic benefits only)				16%				
ERR (economic benefits + sediment retention)				19%				
ERR (economic benefits + full environmental benefits)				20%				

### Main Assumptions:

### Sensitivity analysis / Switching values of critical items:



## II. Incremental Cost Analysis and Global Environmental Benefits

### Overview

The project development objectives are to alleviate poverty and promote sustainable natural resource management practices in degraded hilly and mountainous areas of Northern Armenia. The project will help prevent further deterioration of natural resource base (soil, water, forest, fishery, and biodiversity) and will stabilize local economy. The global development objective of the project is to conserve ecosystems of global biodiversity significance through involvement of local communities, in partnership with state and local governments. The GEF Alternative intends to achieve these objectives at a total incremental cost of approximately **US\$ 5.12 million** above the Baseline. The proposed GEF Alternative should be viewed as complementary to existing biodiversity conservation activities in Armenia.

### Context and Broad Development Goals

Armenia is situated in the meeting zone of the Caucasian, Iranian and Mediterranean flora and fauna region and has a territory of 29,000 sq. km which contains extremely diverse natural landscapes and ecosystems. It is a mountainous country with only 28 percent of land area located below 1,500 m elevation. Armenia's habitats contain nearly all plant communities found in the southern Caucasus and 50% of the region's floral diversity. Of around 17,500 species of invertebrate and vertebrates recorded in Armenia, approximately 300 are considered to be rare or declining. A total of 99 vertebrates are currently listed in the Armenian Red Data Book, and a number are considered internationally threatened (according to the IUCN Red List of Threatened Animals). Some of the threatened vertebrates include mouflon (*Ovis orientalis gmelinii*), wild goat (*Capra aegagrus*), marbled polecat (*Vormela peregusna*), European otter (*Lutra lutra*), brown bear (*Ursus arctos*), manul (*Felis manul*), lammergeier (*Gypaetus barbatus*), imperial eagle (*Aquila heliaca*), great bustard (*Otis tarda*), little bustard (*Tetrax tetrax*), and Caucasian black grouse (*Tetrao mlokosiwiczii*). Large portions of endemic plant and animal species are available only on this land as a potential source of genetic resources.

The project area will include a variety of mountain, forest, meadows and steppe ecosystems in Gegharkunik and Tavoush districts, which host a significant share of the country's biodiversity resources. Specifically, forests in these districts have significant role in fauna conservation and for creation of transboundary wildlife corridor between Armenia and Georgia. Two main protected areas in the geographic area of the project are the Sevan National Park (1,500 sq.km) and Dilijan State Preserve (290 sq.km). Specifically, Lake Sevan National Park harbors unique alpine lake ecosystem and its littoral habitats. Dilijan National Reserve is a unique forest ecosystem preserving many endangered species in southern Caucasus which are dependent on broad-leaved forests for their existence. In addition the area is rich for its cultural heritage amenities, which together with unique ecosystems carries significant potential for developing eco- and natural heritage tourism.

Despite its extensive legislative framework, Armenia's rich natural and biodiversity resource base is under serious threat. The major threats to natural resources and biodiversity can be summarized as:

- Increasing soil depletion by small-scale agricultural activities as a result of poor farming practices, lack of rotation and nutrient enhancing inputs (i.e. fertilizers, manure);
- Degradation of communal pastures due overgrazing has accelerated soil erosion and desertification process on deep slopes;

- Degradation of forest resources near the roads and population centers due to illegal cuttings for timber and fuelwood and grazing of livestock in nearby forests;
- Degradation of critical natural habitats in high mountain forest, steppe and meadow ecosystems due to unsustainable/inadequate management is causing changes in both vegetation and species composition; and
- Poor conservation of protected areas, coupled with weak monitoring and enforcement capacity.

The first three of these threats will be addressed by the Baseline Scenario, as they have direct impact on national benefits. The last two of these threats will be addressed by the GEF Alternative as they affect the globally and regionally important biodiversity resources.

It should be noted that pressures on the environment and natural resources are expected to increase during the ongoing economic crisis as gradual degradation of rural infrastructure (i.e. irrigation systems, energy supply) and decreasing living standards of rural population, are further increasing pressures on forests and agricultural lands.

Despite current economic hardships, the Government of Armenia (GOA) has remained committed to sustainable use of natural resources and improvement the quality of life in the communities that are reliant upon them. The immediate development goals of the GOA include restoration of macroeconomic stabilization and mitigation of possible social impacts of the crisis on the poor. The long-term development goals of the country are poverty alleviation, conservation of its natural and biodiversity resource base, and sustainability of natural resource use. Improved management of natural and biodiversity resources in pilot micro-watershed areas in Tavoush and Gegharkunik marzes in Armenia, which will be achieved by this project, will also contribute toward achieving the country's conservation goals as identified in the Lake Sevan Action Plan (1999), National Environmental Action Plan (1999) and the Biodiversity Strategy Action Plan of Armenia (1999).

#### Baseline Scenario

The Government of Armenia, through the Ministry of Nature Protection (MONP) and Agriculture (MOA), are undertaking a variety of nature conservation programs in Tavoush and Gegharkunik Marzes specifically and in Armenia in general administered by the Department of Forestry (Hayantar); Departments of Protected areas and Biodiversity Conservation and Marza Departments of Agriculture located in Tavoush and Gegharkunik Marzes). The activities include management of existing protected areas (Dilijan State Reserve and Lake Sevan National Park), inventory and data collection, conservation of agro-biodiversity and forest management. The total cost of budget funding for these activities during the 2001 -2005 project period is expected to be **US\$ 2.7 million** (using the exchange rate of ADM 550 to the US dollar).

A number of relevant natural resource management and biodiversity conservation activities in Armenia are being financed by various international developing agencies. The activities carried out by **FAO** focus on sustainable management of forest resources, which overlaps partly with the project area. Their estimated cost is **US\$ 0.6 million** over the project period. **SIDA** has committed to provide **US\$ 1.1 million** to strengthen forest management in Armenia. **UNDP** is considering to finance the Lake Gilli Conservation Project, which is located in the Lake Sevan Nature Park. The project aims to protect rare and endemic biodiversity already present in Lake Gilli and rehabilitation of habitat for threatened wetland biodiversity in Armenia. However, no funding commitment has been made so far.



There are three ongoing/proposed World Bank/IDA funded projects in the project region that will promote sustainable use of natural resources through investments in productive infrastructure, capacity building and alternative income generation programs. The ongoing **Agriculture Reform Support Project** will provide **US\$ 0.5 million** in Tavoush and Gegharkunik Marzes for providing credit to farmers and strengthening agricultural extension and research institutions. The proposed **Second Irrigation Development Project** will finance investments into irrigation infrastructure in two project Marzes at a proposed cost of **US\$ 1.9 million**. Finally, the IDA financed components of the **Natural Resources Management and Poverty Reduction Project** would provide a total of **US\$ 8.3 million** to develop community level natural resources management plans, provide grants to communities for improved management of natural resources and promote development of alternative income generating activities through credit line that, strengthen management capacity of forest sector and provide investments for reforestation and enrichment planting activities. The Baseline Scenario investments in environmental awareness and public participation in biodiversity conservation are effectively zero under the baseline scenario.

The full Baseline Scenario is therefore estimated to cost **US\$ 17.6 million**, and consists of: (a) integrated watershed management: **US\$ 10.3 million**; (b) sustainable forest management: **US\$ 5.7 million**; (c) on-site management of priority protected areas: **US\$ 0.9 million**; and (d) project management: **US\$ 0.7 million**. It is based on a realistic assessment of resources directed to natural resources management and conservation activities and is consistent with the existing institutional capacity and national development goals.

The biodiversity outcome of the Baseline Scenario is expected to be following:

- The Baseline Scenario will improve the conditions of community pastures and high elevation meadows, protect watershed functions, and improve the quality of life of rural communities, but the biodiversity benefits will likely continue to decline. The low agricultural potential of the region is expected to cause further pressures on natural habitats, resulting in loss of globally significant biodiversity.
- The focus of the government efforts in the forestry sector would remain on upgrading the performance of commercial forest operations (including infrastructure). There may be some effort to achieve more diversity in type, scale and intensity of forest management activities. This would involve continued reform in forest policies (sector), creation of field capabilities for monitoring timber operations, and strengthening of agency enforcement capacity. The result of the Baseline Scenario would be more sustainable forest industry, reduced environmental impacts, more diversity of forest management types and scales, and more involvement of local communities in forest management decisions. Biodiversity impacts would generally be positive and include strengthened capacity to assess environmental impacts, enforcement of timber regulations to protect waterways and sensitive sites and some individual conservation sites. However, biodiversity values would not be fully integrated into forest management policy development and timber operations planning and implementation.
- Protected areas remain poorly promoted and managed resulting in a gradual erosion of boundary integrity, increasing pressures on the buffer zones, etc. The negative impact of commercial economic activities, such as, logging and grazing in the buffer zones and in protected areas are expected to be unaffected by Baseline Scenario.

As a consequence of the current course of action, regarded as the Baseline Scenario, existing government resources and international financing efforts will not ensure protection of Armenia's diverse and abundant biodiversity, which will likely continue to suffer from unsustainable timber and fuel wood harvesting,

overgrazing and associated disturbance, illegal hunting, and habitat loss and fragmentation.

### Global Environmental Objectives

The global development objective of the project is to conserve ecosystems of global biodiversity significance through involvement of local communities, in partnership with state and local governments. The project will take an integrated ecosystem management approach to preserve biodiversity resources with global significance, while supporting local economic development and environmental management goals.

GEF Alternative. The GEF Alternative would build on the Baseline Scenario by conserving key ecosystems and biodiversity in Tavoush and Gegharkunik marzes in Armenia; supporting management of existing protected areas; increasing public awareness about biodiversity conservation; and supporting participatory approaches in sustainable natural resources management. The GEF Alternative will also address issues of capacity-building within the Ministry of Nature Protection. It would provide the means for the integration of biodiversity conservation objectives into community resource management plans. Global benefits would include the recovery of forest and steppe habitats protecting endemic and threatened flora and fauna, and effect their recovery. The cost of implementing the GEF Alternative over the five year project period is estimated to be **US\$ 22.7 million**. The principal components of the GEF Alternative are:

- Sustainable use of soil and pasture resources for crop and livestock production, which is integrated with forest resource management through agro- forestry, modified forest grazing and community forestry activities. This would increase the abundance of these biodiversity elements of natural meadows and forests, provide opportunities for non – destructive harvesting of non-wood forest products, and provide incentives for conservation of the forest and grassland habitats that supports species diversity at a cost of **US\$ 11.2 million (GEF financing - US\$ 0.9 million)**;
- Strengthening of the capacity of forestry administration improved planning and management of forest resources. Preparation of a country-wide planning and policy development for the protection of biodiversity and integration of biodiversity conservation into national forestry sector planning including development of certification standards for sustainable forest management. Forest management and afforestation activities in the context of an integrated watershed management planning, which includes rehabilitation of critical forest habitats through involvement of local communities -- **US\$ 5.9 million (GEF financing - US\$ 0.2 million)**;
- On-site management of protected areas (Dilijan State Reserve and Lake Sevan National Park). The GEF Alternative will support boundary demarcation, preparation and implementation of management plans, including consultations with local communities, strengthening of enforcement and management capacity, and investments in basic park infrastructure. Sustainable financing of management activities will be promoted by the development of eco-tourism services and through conservation partnerships with local communities. Support will be provided to develop conservation awareness and education programs in biodiversity conservation and sustainable forest management activities, which would improve capacity of local communities to provide environmental/ biodiversity conservation services. Monitoring the status of key habitats and the impact of project interventions on protecting biodiversity in the project area. The estimated cost of these activities is **US\$ 4.4 million (GEF Financing – US\$ 3.5 million)**.
- Project coordination and management. The GEF Alternative will support project administration and implementation including incremental operation cost of the Project Implementation Unit, essential technical assistance (project audit, institutional coordination, implementation assistance to

communities and public sector training for capacity building) basic equipment and facilities for operation. The estimated cost of these activities is **US\$ 1.2 million** (GEF Financing – **US\$ 0.5 million**).

#### Incremental Costs

The project's incremental cost is **US\$ 5.12 million**, - the difference between the Baseline Scenario (**US\$ 17.6 million**) and the GEF Alternative (**US\$ 22.7 million**). Of this, the GEF is requested to fund **US\$ 5.12 million**. The details of the Baseline and the GEF Alternative are presented in the attached Incremental Cost Matrix.

### Incremental Cost Matrix

Component Sector	Cost Category	US\$ Million	Domestic Benefits	Global Benefits
Community-Based Watershed Management	Baseline	10.3	<ul style="list-style-type: none"> <li>▪ Meaningful participation of local stakeholders for sustainable management of natural resources;</li> <li>▪ Improved crop yields and livestock productivity and resilience against natural disasters;</li> <li>▪ Protection of watershed functions and flow of environmental services;</li> <li>▪ Increased opportunities for alternative income generation;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduced sedimentation of downstream waters (some of which may be international) due to soil stabilization</li> <li>▪ Limited conservation of globally significant biodiversity;</li> </ul>
	With GEF Alternative	11.2	<ul style="list-style-type: none"> <li>▪ Same as above;</li> <li>▪ More sustainable benefit flows from crop and livestock production;</li> <li>▪ Enhanced Government and non-government capacity to manage natural resources in an integrated participatory manner;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Improved protection and management of globally significant biodiversity;</li> <li>▪ Improved flow of environmental benefits (i.e. carbon sequestration, reduced sedimentation of international waters, i.e. Araks river);</li> <li>▪ Improved public environmental awareness;</li> </ul>
	Increment	0.9		
Management of State Forests	Baseline	5.7	<ul style="list-style-type: none"> <li>▪ Improved forest sector policies;</li> <li>▪ Increased opportunities for alternative income generation.</li> <li>▪ Maintained flow</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited conservation of globally significant biodiversity,</li> </ul>

			environmental services;	mostly in remote forest habitats; <ul style="list-style-type: none"> <li>▪ Less destructive logging helps to conserve biodiversity in production forests;</li> <li>▪ Maintained flow of global environmental services (i.e. carbon sequestration);</li> </ul>
	With GEF Alternative	5.9	<ul style="list-style-type: none"> <li>▪ Same as above, plus</li> <li>▪ Improved planning for the sustainability of production forests;</li> <li>▪ More sustainable benefits flows from forest harvests;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mainstreaming of biodiversity conservation objectives into forest sector policies;</li> <li>▪ Enhanced conservation of biodiversity through better management of critical forest habitats;</li> <li>▪ Increased flow of global environmental services (i.e. carbon sequestration) through reforestation activities;</li> </ul>
	Increment	0.2		
Protected Areas Management and Biodiversity Conservation	Baseline	0.9	<ul style="list-style-type: none"> <li>▪ Maintained flow environmental services;</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited conservation of globally significant biodiversity in protected areas;</li> <li>▪ Maintained flow of global environmental</li> </ul>

				services (i.e. carbon sequestration);
	With GEF Alternative	4.4	<ul style="list-style-type: none"> <li>Participation of local stakeholder groups in PA management;</li> <li>Increased institutional capacity of MoNP to manage PAs;</li> <li>Increased revenues from eco-tourism;</li> <li>Increased opportunities for alternative income generation based on sustainable utilization of biodiversity in buffer zones and protected areas.</li> </ul>	<ul style="list-style-type: none"> <li>Improved protection and management of globally significant sites and biodiversity;</li> <li>Increased public awareness of issues related to biodiversity conservation and participatory schemes for sustainable management of natural resources;</li> <li>Improved monitoring and information of endemic flora and fauna and key habitats;</li> </ul>
	Increment	3.5		
Project Coordination and Management	Baseline	0.7	<ul style="list-style-type: none"> <li>Improved management and coordination of the project activities.</li> </ul>	<ul style="list-style-type: none"> <li>Implementation of biodiversity conservation activities of the project.</li> </ul>
	With GEF Alternative	1.2	<ul style="list-style-type: none"> <li>Improved participation of local communities in the implementation of project activities.</li> </ul>	<ul style="list-style-type: none"> <li>Increased involvement of local communities in biodiversity conservation.</li> <li>Improved coordination of biodiversity conservation activities with relevant institutions responsible for the natural resources management activities.</li> </ul>
	Increment	0.5		
Totals	Baseline	17.6		
	With GEF Alternative	22.7		
	Increment	5.12		



**Annex 5: Financial Summary**  
**ARMENIA: Natural Resources Management and Poverty Reduction Project**  
**Years Ending**

	IMPLEMENTATION PERIOD						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
<b>Total Financing Required</b>							
<b>Project Costs</b>							
<b>Investment Costs</b>	1.9	2.7	3.7	3.0	1.6	0.9	0.0
<b>Recurrent Costs</b>	0.3	0.3	0.4	0.4	0.4	0.1	0.0
<b>Total Project Costs</b>	2.2	3.0	4.1	3.4	2.0	1.0	0.0
<b>Total Financing</b>	2.2	3.0	4.1	3.4	2.0	1.0	0.0
<b>Financing</b>							
<b>IBRD/IDA</b>	1.0	2.7	4.4	3.1	1.7	0.5	0.0
<b>Government</b>	0.3	0.2	0.2	0.2	0.2	0.4	0.0
<b>Central</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Provincial</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Co-financiersSIDA</b>	0.4	0.3	0.1	0.1	0.1	0.1	0.0
<b>User Fees/Beneficiaries</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Other</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total Project Financing</b>	1.7	3.2	4.7	3.4	2.0	1.0	0.0

**Main assumptions:**

The IBRD/IDA financing plan includes GEF contribution as well which totals to US\$13.4 million.

Figures may slightly differ due to rounding.



## **Annex 6: Procurement and Disbursement Arrangements**

### **ARMENIA: Natural Resources Management and Poverty Reduction Project**

#### **Procurement**

Summary of Procurement Procedures. Proposed procurement arrangements are summarized in Tables A and A1. Consulting services, goods and works financed the World Bank Group shall be procured in accordance with the Bank's procurement guidelines (Goods and works contracts will be procured in accordance with the provisions of the "Guidelines for Procurement under IBRD Loans and IDA Credits" published by the Bank in January 1995 and revised in January and August 1996, September 1997, and January 1999; contracts for consultants' services will be awarded in accordance with the provisions of the "Guidelines for the Selection and Employment of Consultants by World Bank Borrowers" published by the Bank in January of 1997 and revised in September 1997 and January, 1999). During project implementation, the procurement plan will be updated on an as-needed basis, basically during supervision missions. All other procurement information, including capability of the implementing agency (procurement assessment report of the PIU is separately submitted) and the Bank's review process is presented in Table B and below.

Participation of Nongovernmental Organizations (NGOs). Nongovernmental Organizations (NGOs) can compete in the selection process under the provisions of Bank Guidelines, provided that they have expressed their interest in doing so, and that their qualifications are satisfactory to both the Government and the Bank. NGOs as eligible voluntary nonprofit organizations may be uniquely qualified to assist in the preparation, management, and implementation of projects, essentially because of their involvement and knowledge of local issues, community needs, and/or participatory approaches. For assignments that emphasize participation and considerable local knowledge, the short list may comprise entirely NGOs. If so, it is suggested that the QCBS procedure be followed, and that the evaluation criteria reflect the unique qualifications of NGOs, such as voluntarism, nonprofit status, local knowledge, scale of operation, and reputation. Selection of Consultants and their contracts will be based on the standard documents issued by the Bank for the procurement of such services with the minimal necessary modifications as agreed by the Bank.

Participation of Government Owned Enterprises (GOEs) in goods, works and consultants' contracts funded by the Credit/Grant. GOEs will not be eligible to participate in tenders for such contracts unless they meet the Bank's eligibility criteria. They must be legally and financially autonomous, operate under commercial law in Armenia and cannot be a dependent agency of the Beneficiary or sub-Beneficiary of the project. Interested GOEs must properly clarify their status before participating in any bid under this project. The PIU has the obligation of exhaustively checking all the related information before clearing GOE's participation with the Bank.

The Project Implementation Unit and its capacity to deal with procurement activities. The Ministry of Nature Protection (MONP) would be the leading agency responsible for project implementation and coordination, supported by a Project implementation Unit. An Inter-ministerial Project Management Board chaired by the Minister of nature Protections, which would include the Marzpets, would provide overall supervision and approval of annual work-plans. The heads of Hyantar (Department of Forestry) and the Protected Areas departments respectively would have a particular role in coordinating the forestry and protected areas activities.

The Project Implementation Unit would be responsible for all procurement operations, including

procurement supervision, which are funded by the Bank fully or partially, including, *inter alia*, (i) recruitment and management of foreign and national consultants; (ii) preparation and submission to the Bank the required documents for clearance and/or information; (iii); undertaking project monitoring of physical and financial progress and evaluation of project impact, etc. The PIU, as needed, will procure services for implementation support to communities from local service providers with records of experience in community development. Selected eligible local entities may be authorized to make limited decisions, beyond which they will seek PIU's clearance.

Summary of the assessment of the current PIU to conduct procurement. An assessment of the PIU's capacity to implement procurement started in June of 2001, based on the then PPU staff. The PIU has been dealing with small grants and conducting basically small procurement of consultants' services under them, but there has never been a dedicated procurement staff. Due to the above, PIU has to be rated in the high risk category and the lowest procurement thresholds for prior review have to be set, at least until the PIU has built procurement capacity. While at the beginning of the project the procurement person may not be hired on a full-time basis, after project negotiations at least two procurement specialists have to be funded full-time to conduct procurement activities and ensure project implementation. Both the high risk category and the resulting low procurement thresholds are subject to revision once the Bank determines that the required procurement capacity has been built in the PIU.

Measures to strengthen procurement capacity of PIU will include: (i) hiring of professionally trained procurement staff experienced in procurement under WB funding; (ii) ensure that the procurement staff attend procurement training courses and/or seminars on Bank-funded procurement, to update and improve PIU's procurement capacity; (ii) the project launch workshop should include a comprehensive seminar on procurement and financial management, including hands-on preparation of bidding documents for each type of procurement method proposed in the Grant/Credit agreement; (iii) an electronic library including all the Bank standard procurement documents available will be transferred to the PIU after appraisal; and (iv) supervision missions should include an accredited procurement specialist to conduct post review of contracts not subject to Bank's No Objection, provide consultation on general and specific procurement issues and resolve pending issues. The frequency of these missions with PAS should be every six months for the first year of implementation.

A PPF has been prepared to help implement the first steps of project implementation.

The advertising for the hiring of an experienced local procurement advisor has commenced.

### **Procurement of Works and Goods**

The Borrower will use the Bank's standard bidding documents for goods and works, including the Bank's regional sample documents.

Civil Works (expected aggregate sum US\$6.345 million): The project will fund: rehabilitation of and restoration of buildings and offices; rehabilitation of roads; protection works of high value diversity forest; nursery works; forestation works; upgrading and landscaping works; and works under the Watershed Management Component and Grants. The following methods will apply for procurement of works contracts funded by IDA/GEF:

*International Competitive Bidding (ICB).* ICB procedures will be applied for civil works contracts expected to cost starting US\$300,000 and above.

*National Competitive Bidding (NCB).* NCB procedures will be applied for civil works contracts estimated to cost below US\$300,000 (aggregate sum: US\$2.038 million). For these contracts, Bank standard NCB documents will be used. All efforts should be made to ensure proper advertisement nationally, so that a wide range of eligible local contractors, and also foreign contractors, if interested, can have the opportunity to bid.

Bank (ECA) standard NCB bidding document will be used for NCB procedures, and Bank Guidelines will be applied, including issuance of minutes of bid opening. During negotiations the Bank highlighted unacceptable features in national procedures that should NOT be applied for NCB, like the two envelope system; less than 30 days bidding time; absence of advertisement in national press; public bid opening; absence of bid opening publication; merit point system of evaluation; award not made to the lowest evaluated responsive bidder; price negotiations without Bank's prior consultation; preferences in price or conditions to any class of bidders; exclusion of foreign bidders, etc. Finally, it has been clarified that only those firms that meet the Bank's eligibility criteria under the Guidelines will be allowed to participate in NCB or any other methods.

*Minor Works (MW).* Civil works contracts with an estimated cost below US\$50,000 (aggregate sum: US\$4.307 million) shall be procured under lump-sum, fixed price or unit rate contracts awarded on the basis of quotations obtained by at least three qualified eligible local contractors from a list formed in response to local advertisement and periodically updated through regular advertisement. The bidding document shall include a detailed description of works, including basic specifications, the required completion period, a basic form of agreement consistent with the standard document (to be cleared by the Bank) and relevant drawings, where applicable. The award shall be made to the contractor who offers the lowest price quotation for work, meets the technical specifications and has the experience and resources to successfully complete the contract.

Procurement of Goods (aggregate sum: US\$2.140 million) will comprise: office furniture; computers, printers, peripherals, fax machines and telephones and other equipment needed for office work; vehicles (cars, tractors, trailers, four wheel drives, trucks, motorcycles, boats, fire truck, horses); laboratory equipment; reference materials; equipment and tools for forestry work; safety equipment; repair equipment for protected areas; air conditioners; fire equipment; GIS system and communication equipment; satellite imagery; field equipment (logging equipment: cable crane, tools, uniforms, raingear, boots, compasses, binoculars, spotting scopes, tripods, etc.); repair equipment; boat engines; agricultural inputs, etc. The following methods will apply for procurement of goods contracts funded by IDA/GEF:

Goods contracts estimated to cost US \$100,000 or more will be procured through International Competitive Bidding.

Limited International Bidding (LIB): for an expected aggregate sum of US\$50,000, LIB will be used to procure cable crane manufactured by a very limited number of firms.

Direct Contracting (DC): for an estimated aggregate of US\$36,000, DC procedures will be used for proprietary items (engines for ships to be rehabilitated), and purchase of satellite imagery.

International Shopping (IS), based on a comparison of quotes from at least three suppliers from two different countries will be used for goods in an aggregate sum of approximately US\$ 68,000, basically equipment for logging workers and GIS systems. In this case, there will be exceptions allowing to

procure certain equipment in contracts with estimated values below US\$50,000, due to its non-existence in the national market. This figure does not comprise goods to be purchased under Component 1. This figure does not comprise goods to be purchased under Component 1.

National Shopping (NS) procedures will be used for goods contracts estimated to cost less than US\$50,000 each, to be awarded on the basis of three written price quotations from eligible local suppliers (aggregate sum: US\$498,000). NS will basically cover office furniture, computers, office and miscellaneous equipment, vehicles for PIU, GPS equipment, photo and video equipment, horses, boats, safety equipment, forestry tools, lab equipment, reference materials for library, internet connection, air conditioners, etc.

### **Procurement of Consultants' Services**

Assignments estimated to cost less than \$100,000 equivalent can be procured based on shortlists comprising only local firms.

Technical assistance would be provided to villagers and public sector staff through demonstration activities for sustainable farming, training and study tours, preparation of MC and community FM plans, forest certification and strengthening operational capacities of forest service and its local branches, reforming and adapting the legal framework towards sustainable forest management, biodiversity conservation and communal involvement; forest policy and regulatory framework; studies, public education activities, technical assistance for improving the policy framework for biodiversity conservation and mainstreaming it into national forest laws and regulations; preparation of PA management plans and applied studies on management needs; workshops; public consultations on management plans; technical assistance needed for project management (e.g. PIU consultants, project audit services by audit firm, etc).

Selection of firms. Quality-and Cost-Based Selection (QCBS) will be the preferred method for selection of firms in contracts with estimated values above US\$100,000. Least Cost Selection Method (LCS) is expected to be applied to procurement of contracts for audit, most of training and information dissemination services. Contracts for construction monitoring and preparation of management plans for Hayantar; monitoring and evaluation services, organization of workshops and international study tours and policy studies are expected to be procured following the selection based on either LCS or Consultants Qualifications (CQ).

Selection of Individuals. Individual consultants to provide a wide variety of technical assistance services will be selected on the basis of their qualifications for the assignment, mostly by comparing at least 3 CVs from potential eligible candidates. Most consultancy positions will be advertised locally in at least 3 newspaper of nation-wide circulation or internationally (UNDB on line), depending on their size and relevance.

### **Procurement Under the First Component and Community-based Procurement/Non-identified small-size procurement packages.**

Community-based procurement must be conducted according to the procedures laid out in the Manual for Conducting Very Small-Value Procurement Under World Bank/IDA Small Grants, Loans and Credits, approved in ECA (single purchases of goods, works and services estimated to cost less than \$500 equivalent may be conducted on the basis of local commercial practices screened with anticipation by the PIU and acceptable to the Bank, including sole sourcing when appropriate).

The majority of the contracts under the project are for small civil works under the watershed component, which are demand driven and therefore a specific procurement plan including them cannot be submitted at this stage. Procurement under this component is expected to be conducted mainly based on community participation. Regarding Community Participation in Procurement, Bank Guidelines state in para 3.15: "Where, in the interest of project sustainability, or to achieve certain specific social objectives of the project, it is desirable in selected project components to (i) call for the participation of local communities and/or non governmental organizations (NGOs), or (ii) increase the utilization of local know-how and materials, or (iii) employ labor-intensive and other appropriate technologies, the procurement procedures, specifications, and contract packaging shall be suitably adapted to reflect these considerations, provided these are efficient. The procedures proposed shall be outlined in the PAD and the Loan Agreement."

Communities under this program are selected by a Committee formed by representatives of PIU and local authorities and relevant organizations, based on concrete requirements and parameters agreed with the Bank. Grants are also awarded by evaluation committees to beneficiaries based on proposals and compliance with requirements previously agreed with the Bank. Beneficiaries should document all purchases made under this program and agree to inspection and audit as required.

The following recommendations are designed to achieve the best application of CBP in our project:

There will be a Framework Agreement signed between the PIU and the Village Council spelling out the responsibilities of each party in procurement, disbursement and financial management (the Village Council is a legal entity, democratically elected in accordance with the Law of Local Self-Governance). PIU will provide assistance to Village Councils and other beneficiaries, as needed, on technical, procurement and disbursement issues. Village Council Members will be invited to participate in the procurement process as members of evaluation committees when dealing with procurement under Village Framework Agreements. During supervision, Village Council performance will be assessed, as well as their built capacity. The PIU must consider transfer of some procurement function to Village Council as required while keeping the general control and supervision of the procurement process. Verification and audit arrangements of the purchases made under the component have must be conducted by PIU and/or project auditors. The procedures should be as simple and direct as possible so to be understood by the majority of the beneficiaries. It is advisable to introduce incentives in the procedures so that the communities and other beneficiaries will have a vested interest in economizing resources (for example, if the community or a beneficiary can carry out a project using less funds than budgeted, the remaining resources would be used to extend or improve the project). To ensure transparency, alternative methods for publicizing opportunities should be considered (for example, indicating the products required on bulletin boards in the main square, using the town radio or any other available method of information dissemination must be employed). PIU should exercise authority in ensuring that contractors and suppliers are in compliance with Armenia's technical parameters, environmental safeguards. These provisions and all others included in the Environment Mitigation Plan should be reflected and become mandatory for works contracts. One of the main functions of the Construction Engineer in the PIU will consist in ensuring that the above provisions are fully complied with by contractors during contract implementation. If there will be community contributions in kind (i.e., molding bricks, collecting sand) that might delay the implementation, it has to be stated so that contractors are aware that implementation will depend on such contributions. One of the mandatory requisites for award of small works contracts and contracts for any other activity requiring labor-intensive technologies in the community should be the hiring of locals, and the contract packaging should reflect this important consideration.

Because of potential lack of transparency in community-based procurement, it is mandatory to maintain records of expenditures and methods of procurement and there should be some spot checks (post reviews) by entities and the Bank (for the latter, if resources permit).

Training, workshops and study tour expenses. Training, workshops and study tours will be carried out according to a training plan (and included in the Project Operations Manual), which the PIU will revise annually and submit to IDA/GEF for approval prior to implementation.

Incremental Operating Costs. The project will finance incremental operating costs for the PIU, incurred as a result of project implementation. These include management expenses, installation of phone lines, installation of internet service, consumables, and operation and maintenance expenses, including communications, fuel and travel expenses needed by PIU and other eligible personnel.

### **Prior Review**

Goods and Works. The following contracts are subject to the Bank's prior review as set forth in paragraphs 2 and 3 of Appendix 1 to the Guidelines: (i) all ICB contracts and all contracts procured under LIB and DC procedures and all works contracts estimated to cost above \$200,000 equivalent; ii) the first two contracts procured under NCB, IS and NS procedures and for minor civil works are subject to prior review, regardless of their contract value.

Consulting Services With respect to consulting services, prior Bank review will be required for all terms of reference for consultants. Contracts for services estimated to cost the equivalent of \$100,000 or more for firms and \$20,000 or more for individuals are subject to Bank's prior review as set forth in paragraphs 2 and 3 of Appendix 1 to the Guidelines. For contracts with individuals, all terms of reference will be prior reviewed. All other contracts are subject to post review (one in 5 contracts). With respect to the selection of individuals, most consultancy positions will be advertised nationally or internationally.

Prior Review and other thresholds may be revised during the life of the project, based on implementation and procurement capacity built in PIU.

### **Procurement methods (Table A)**

**Table A: Project Costs by Procurement Arrangements**  
(US\$ million equivalent)

Expenditure Category	Procurement Method <sup>1</sup>				Total Cost
	ICB	NCB	Other <sup>2</sup>	N.B.F.	
<b>1. Works</b>	0.00 (0.00)	2.04 (1.79)	4.30 (3.79)	0.02 (0.00)	6.36 (5.58)
<b>2. Goods</b>	0.98 (0.96)	0.00 (0.00)	1.16 (1.13)	0.39 (0.00)	2.53 (2.09)
<b>3. Services (Technical Assistance + Training)</b>	0.00 (0.00)	0.00 (0.00)	3.57 (3.55)	1.06 (0.00)	4.63 (3.55)

<b>4. Grants</b>	0.00 (0.00)	0.00 (0.00)	0.62 (0.62)	0.00 (0.00)	0.62 (0.62)
<b>Recurrent Costs</b>	0.00 (0.00)	0.00 (0.00)	1.84 (1.57)	0.02 (0.00)	1.86 (1.57)
<b>Total</b>	0.98 (0.96)	2.04 (1.79)	11.49 (10.66)	1.49 (0.00)	16.00 (13.41)

<sup>1/</sup> Figures in parenthesis are the amounts to be financed by the IDA Credit. All costs include contingencies.

<sup>2/</sup> Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to managing the project.

**Table A1: Consultant Selection Arrangements (optional)**  
(US\$ million equivalent)

Consultant Services Expenditure Category	Selection Method							Total Cost <sup>1</sup>
	QCBS	QBS	SFB	LCS	CQ	Other	N.B.F.	
<b>A. Firms</b>	0.17 (0.17)	0.00 (0.00)	0.00 (0.00)	0.14 (0.14)	0.17 (0.17)	0.00 (0.00)	1.04 (0.00)	1.52 (0.48)
<b>B. Individuals</b>	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.52 (0.52)	0.00 (0.00)	0.52 (0.52)
<b>Total</b>	0.17 (0.17)	0.00 (0.00)	0.00 (0.00)	0.14 (0.14)	0.17 (0.17)	0.52 (0.52)	1.04 (0.00)	2.04 (1.00)

1\ Including contingencies

Note: QCBS = Quality- and Cost-Based Selection

QBS = Quality-based Selection

SFB = Selection under a Fixed Budget

LCS = Least-Cost Selection

CQ = Selection Based on Consultants' Qualifications

Other = Selection of individual consultants (per Section V of Consultants Guidelines),  
Commercial Practices, etc.

N.B.F. = Not Bank-financed

Figures in parenthesis are the amounts to be financed by the Bank Credit.



Prior review thresholds (Table B)

**Table B: Thresholds for Procurement Methods and Prior Review** <sup>1</sup>

<b>Expenditure Category</b>	<b>Contract Value Threshold (US\$ thousands)</b>	<b>Procurement Method</b>	<b>Contracts Subject to Prior Review (US\$ millions)</b>
<b>1. Works</b>	>300	ICB	0.76
	<300	NCB	
	<50	MW	
<b>2. Goods</b>	>100	ICB	1.13
	<100	IS	
	<50	NS	
	<50	LIB	
	<50	DC	
<b>3. Services</b>	>100	QCBS	0.65
		LCS	
	<100	CQ	
		Ind	
<b>4. Grants</b>	N/A	As per Procurement for Small Grants Manual	0.00
<b>5. Recurrent Costs</b>	N/A	N/A	0.00

**Total value of contracts subject to prior review:** 2.54

**Overall Procurement Risk Assessment**

**High**

**Frequency of procurement supervision missions proposed:** One every 6 months (includes special procurement supervision for post-review/audits)

<sup>1</sup> Thresholds generally differ by country and project. Consult OD 11.04 "Review of Procurement Documentation" and contact the Regional Procurement Adviser for guidance.

## **Disbursement**

### **Allocation of credit proceeds (Table C)**

**Table C: Allocation of Credit Proceeds**

<b>Expenditure Category</b>	<b>Amount in US\$million</b>	<b>Financing Percentage</b>
Works	3.90	90%
Goods	0.86	100% of foreign expenditures, 100% of local expenditures (ex-factory cost) and 80% of local expenditures for other items locally
Consultants Services	1.36	100%
Grants	0.17	100%
Incremental Operating Costs	0.58	
Project Preparation Facility	0.43	Amount due pursuant to Section 2.02 (c) of this agreement
Unallocated	1.00	
<b>Total Project Costs</b>	<b>8.30</b>	
<b>Total</b>	<b>8.30</b>	

### **Use of statements of expenditures (SOEs):**

#### **Special account:**

The completion of preparation phase is under implementation and is funded by a GEF PDF B Grant of a total amount of USD 210,000. This phase have been the testing ground for the financial management arrangements for the NRMPR project that has just been negotiated. The total amount of financing for the NRMPR project will be equivalent to USD 16.0 M. with the following four sources of funding:

- |    |                                |         |
|----|--------------------------------|---------|
| 1. | IDA Credit                     | USD 8.3 |
| 2. | GEF Grant                      | USD 5.2 |
| 3. | SIDA financing (Swedish Grant) | USD 1.0 |
| 4. | Counterpart funds              | USD 1.5 |

Separate Special Accounts, for the IDA and GEF funds, will be opened in a commercial bank acceptable to the Bank as soon as the NRMPR project will become effective. Project expenditure will be covered by each of the four sources of funds according to the co-financing arrangements and different % of eligibility defined in project documents. SIDA's funding will be on a parallel basis and all funds will be disbursed through Direct Payments for Technical Assistance activities included in sub-item for the Strengthening of Legal and Institutional Policy Framework) of Component B. The project, under Component A, will have a small grants scheme sub-component that will distribute financial support to Village Councils. Counterpart funds will be deposited in a Project Account opened in a commercial bank. A Project Preparation Facility (PPF) will be advanced from the proceeds of the IDA credit for an equivalent amount of USD 450,000.

**Risk analysis:** The following table summarizes the estimation of the financial management risks associated with the project:

	<b><i>Risk Assessment</i></b>	<b><i>Comments</i></b>
Inherent Risk	<b><i>H</i></b>	<b><i>SMN</i></b>
1. Country Financial Management Risk		<i>There is no CFAA for the Country</i>
2. Project Financial Management Risk		
3. Perceived Corruption		
<b><i>Overall Inherent Risk</i></b>		
Control Risk		
1. Implementing Entity		
2. Funds Flow		
3. Staffing		
4. Accounting Policies and Procedures		
5. Internal Audit		<i>There is no Internal Audit</i>
6. External Audit		
7. Reporting and Monitoring		
8. Information Systems		
<b><i>Overall Control Risk</i></b>		

H – High      S – Substantial      M – Moderate      N – Negligible or Low

**Strengths and weaknesses:** Considering that this is a newly established PIU, there is no particular strength in the financial management arrangements and capacity the PIU. However capacity should further increase with the hiring of a Finance Manager. The appointment is expected before, or around, credit effectiveness. It is also expected that the PIU Director, which has been recently hired, will bring some skills and expertise to the PIU capacity thanks to his previous experience as Finance Manager in another Bank-financed project.

**Implementing entity and staffing:** Being a newly established entity, staffing has not yet been completed. The financial management staffing currently in place consist only of an accountant that handles both accounting and disbursement matters. The accountant was hired in September 2001 and has established the financial management arrangements for the project besides handling the accounting for the Preparation Phase.

The accountant has previously worked in another PIU implementing a Bank-financed project with accounting and disbursement responsibilities (however this was before the Bank introduced the LACI reform). She has therefore acquired some knowledge of the Bank financial management and disbursement

requirements. Further to this and while setting up a spreadsheet based accounting system for the preparatory phase, that has been subsequently replaced by the software system, the accountant has been able to build up some knowledge of the Bank latest financial management requirements.

For the preparation phase, financial management staffing can be considered adequate. However, before the NRMPPR project becomes effective the PIU will hire a Finance Manager that will oversee the work of the accountant. This will also enhance some segregation of duties between accounting and disbursement although it is expected, considering the size of the entity's staff, that there will not be a clear cut segregation of duties.

During the establishment of the system on-the-job training has been delivered to the accountant by the Bank FMS, however further training will be beneficial for both staff, accountant and Finance Manager, in order to properly handle the software package and the project accounting, disbursement and controls arrangements.

***Accounting policies and procedures:*** The PIU accounting system is based on a single Chart of Accounts that include all the accounts needed for the different phases of the project.

The Chart of Accounts feed into three separate Accounting Journals established for each phase of the project:

1. the Preparation Phase (PDF Block B GEF Grant) which is currently under implementation and will be closed in June 2002,
2. the PPF phase (Credit advance) which is not yet effective, and
3. the Project implementation, also not yet effective.

During the implementation of the NRMPPR project, the PIU accounting system will capture all transactions related to the (i) IDA, (ii) GEF and (iii) Counterpart funding while SIDA funding will not be recorded into this system because the use of the SIDA funds will occur under a separate agreement that foresee payments executed directly by SIDA (PIU will therefore not be able to have full control of accounting evidence).

During the NRMPPR project implementation IDA and GEF will provide financing for micro-catchment plans (MCP), under component A. There will be around 100 grants with an average amount of about USD 50,000 during the life of the project. Each of the beneficiaries will open a bank account in a commercial bank to which the PIU will transfer, from the IDA and GEF Special Accounts, the amount of each eligible contract /expenditure. This bank account will be used as a "Special Account" by the beneficiary, therefore only for the purposes of the project. This account will be basically a transitory account and it is not expected to hold funds for long periods of time. In fact, once the beneficiary receives the invoice, after checking the eligibility of the expenditures, the beneficiary will submit a request to the PIU for the transfer of the amount of the invoice and the payment will be made as soon as funds will be available in the account.

The financial management arrangements established by the PIU include also a Financial Management Manual for the Preparation Phase and one for the NRMPPR project. These Manuals describe the financial management arrangements and the accounting policies and procedures for the Preparation Phase and for the NRMPPR Project. The NRMPPR Manual also include a section in which it is described the financial management arrangements that the grant beneficiaries will have to set up when receiving financial support (the grant) from the project. Each beneficiary will have to establish, according to the above said manual, a simple accounting system (i.e. cash book) and the PIU will be responsible in controlling these systems.

**Audit:** The PIU will be responsible for carrying out the selection and appointment of the auditor. The auditor for the Preparation Phase (September 2001/ June 2002) has already been appointed (Grant Thornton Amyot) and the audit should be completed in two phases (i) audit of FY01 accounts (Sep 1- Dec. 31) and (ii) audit of FY02 accounts (Jan. 1 – June 30). The audit TORs have been cleared by the Bank

FMS. Considering that the NRMPP project (including the PPF) has not yet become effective, the appointment of the auditor for FY02 should be completed not later than November 30, 2002.

**Reporting and monitoring:** The PIU has completed the customization of the financial management arrangements which are based on a software that is able to produce automatically the Financial and Procurement FMRs, beside the reports that the PIU need to prepare for the Ministry of Finance, Ministry of Nature Protection and Prime Minister's office. The FMR Physical Monitoring Report will be prepared by the accountant only manually since the system is not able to capture all the needed data for this report.

Format of the FMRs have been agreed between the Bank FMS and the PIU and consist of the following reports:

Financial reports

1. Project Sources and Uses of Funds Statement
2. Uses of Funds by Project Activity Statement
3. Cash Withdrawals Statement
4. Special Account Statement

Project progress report

5. Output Monitoring Reports

Procurement management reports

6. Procurement Process Monitoring (Consultants Services)
7. Procurement Process Monitoring (Goods and Works)

The PIU will deliver the FMRs on file format to the Bank FMS and to the TTL on a quarterly basis, within 30 days from the end of each quarter.

**Disbursement arrangements and Flow of Funds:** The Special Account (USD) and the sub-account (DRAM) for the Preparation Phase have been opened in a commercial bank (Hong Kong and Shanghai Banking Co.- HSBC, Yerevan Office). For small local payments in DRAMs, funds are transferred from the SA to the sub-account .

As soon as the NRMPP project will become effective, the PIU will open, in a commercial bank acceptable to the World Bank, a (i) Special Account to which IDA funds will be transferred and a (ii) GEF Special Account to which the GEF funds will be transferred. The IDA funds will be transferred from the Credit Account to the Special Account while the GEF funds will be transferred from the GEF Trust Fund Grant Account (or Loan Account) to the GEF Special Account.

The PIU will also open, in a commercial bank acceptable to the World Bank, a Project Account in which the Armenian government will deposit the counterpart funds. In order to avoid cash flows problems experienced in other Bank-financed projects in Armenia, which were due to shortage in counterpart funding, it has been agreed during Negotiations that, as condition of effectiveness, the Project Account should be opened and an initial deposit of US\$75,000 equivalent is deposited. The account will have to be replenished on a monthly basis.

SIDA's financing will be on a parallel basis and all funds will be transferred through Direct payment for TA activities included in sub-item (Strengthening of legal and institutional Policy Framework) of Component B.

**Annex 7: Project Processing Schedule**  
**ARMENIA: Natural Resources Management and Poverty Reduction Project**

<b>Project Schedule</b>	<b>Planned</b>	<b>Actual</b>
<b>Time taken to prepare the project (months)</b>	18	30
<b>First Bank mission (identification)</b>	04/16/1999	04/16/1999
<b>Appraisal mission departure</b>	10/15/2001	11/25/2001
<b>Negotiations</b>	12/15/2001	03/01/2002
<b>Planned Date of Effectiveness</b>	12/23/2001	06/04/2002

**Prepared by:**

Ministry of Nature Protection of Republic of Armenia, PIU Coordinator Gayane Minasyan/Gohar Chazynian, Georgy Arzumanyan, Participation Specialist. Valuable assistance and inputs were provided by the Ministries of Agriculture, Finance and Economy, MONP Department of Protected Areas, the Dilijan Reserve and Sevan National Park authorities, local governments of Gegharkunik and Tavoush Marzes, Hayantar and the Forestry Research Center.

**Preparation assistance:**

Preparation assistance was provided by Arcadis Euroconsultants in association with VISTAA (financed via PHRD grant); ERM (financed under Tacis/JEP program); LTS International Ltd.( via GEF PDF Block B ) and a professional team of local experts.

**Bank staff who worked on the project included:**

<b>Name</b>	<b>Speciality</b>
Adriana Damianova	Program /Task Team Leader
Paavo Eliste	Natural Resource Economist
Gerhard Dieterle	Principle Forestry Specialist
Phillip Brylski	Senior Biodiversity Specialist
Julian Lampietti	Social Development Economist
John Fargher	Agricultural and Forestry Economist, Consultant
Sandro Zanusi Michei	Financial Management Specialist
Jose Martinez	Procurement
Daria Goldstein	Legal Counsel
Gayane Minasyan	Operations Analyst, Yerevan CO (since November 2001)
Rohan Selvaratnam	Operation Analyst Project Costing
Irene Bomani	Program Assistant
Nedret Durutan	Peer Reviewer
Juergen Voegelé	Second Peer Reviewer

**Annex 8: Documents in the Project File\***  
**ARMENIA: Natural Resources Management and Poverty Reduction Project**

**A. Project Implementation Plan**

Completed in draft.

**B. Bank Staff Assessments**

Social Assessment , 2001

Qualitative Survey of Selected Rural Households

Armenia Natural Resources Management and Poverty Reduction Project: Preparation Report, ARCADIS EuroConsult , Draft Final Report October 2001

Armenia Natural Resources Management and Poverty Reduction Project - Management of State Forests, ERM , Final Draft Report, November 2001

Natural Resources Management and Poverty Reduction Project: Protected Areas Management Preparation Plan – Draft, November 200 , LTS International Ltd.

Procurement Assessment, January 2002

Environmental Impact Assessment, January 2002

**C. Other**

Armenia NEAP and Working Group Reports , 1999

Biodiversity Strategy and Action Plan of Armenia, UNDP 1999

Lake Sevan Action Plan, 1998

Armenia Forest Resources Assessment, Thurensen, Dranakerberg, Ter-Gazaryan, National Board of Forestry of Sweden, SIDA

National Program to Combat Dessertification in Armenia, UNEP, draft 2001

\*Including electronic files

## Annex 9: Statement of Loans and Credits

### ARMENIA: Natural Resources Management and Poverty Reduction Project

24-Sep-2001

Project ID	FY	Purpose	Original Amount in US\$ Millions		Cancel.	Undisb.	Difference between expected and actual disbursements <sup>a</sup>	
			IBRD	IDA			Orig	Frm Rev'd
P055022	2002	IRRIG DEVT - AM	0.00	24.86	0.00	25.41	0.00	0.00
P065189	2001	SAC 4	0.00	50.00	0.00	33.70	5.17	0.00
P057838	2001	JUDICIAL REFORM	0.00	11.40	0.00	10.40	-0.32	0.00
P044829	2000	TRANSPORT	0.00	40.00	0.00	30.66	-7.50	0.00
P057952	2000	SIF II	0.00	20.00	0.00	19.15	-1.36	0.00
P064879	1999	IRRIG DAM SAFETY - AM	0.00	26.60	0.00	17.82	2.04	0.00
P057560	1999	TITLE REG - AM	0.00	8.00	0.00	4.68	2.26	0.00
P008276	1999	ELEC TRANSM & DISTR	0.00	21.00	0.00	17.34	12.31	2.92
P008281	1998	EDUCATION	0.00	15.00	0.00	1.23	0.85	0.00
P035805	1998	MUN DEVT	0.00	30.00	0.00	19.40	7.36	0.00
P035806	1998	AGR REF SUPPORT - AM	0.00	14.50	0.00	2.13	1.29	0.00
P050140	1998	HEALTH	0.00	10.00	0.00	3.87	3.80	0.00
P051026	1998	SATAC 2	0.00	5.00	0.00	1.69	1.94	0.70
P008279	1997	ENT DEVT	0.00	16.75	0.00	0.82	1.98	0.00
Total:			0.00	293.11	0.00	188.29	29.82	3.62



ARMENIA  
STATEMENT OF IFC's  
Held and Disbursed Portfolio  
May-2001  
In Millions US Dollars

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
	Total Portfolio:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Approvals Pending Commitment							
FY Approval	Company	Loan	Equity	Quasi	Partic				
2000	Hotel Armenia	0.00	3.60	0.00	0.00				
	Total Pending Commitment:	0.00	3.60	0.00	0.00				

## Annex 10: Country at a Glance

### ARMENIA: Natural Resources Management and Poverty Reduction Project

POVERTY and SOCIAL	Armenia	Europe & Central Asia	Low-income
1998			
Population, mid-year (millions)	3.8	473	3.515
GNP per capita (Atlas method, US\$)	480	2,190	520
GNP (Atlas method, US\$ billions)	1.8	1,039	1,844
Average annual growth, 1992-98			
Population (%)	0.3	0.1	1.7
Labor force (%)	-1.2	0.6	1.9
Most recent estimate (latest year available, 1992-98)			
Poverty (% of population below national poverty line)	..	..	..
Urban population (% of total population)	69	68	31
Life expectancy at birth (years)	75	69	63
Infant mortality (per 1,000 live births)	15	23	69
Child malnutrition (% of children under 5)	..	..	..
Access to safe water (% of population)	85	..	74
Illiteracy (% of population age 15+)	1	4	32
Gross primary enrollment (% of school-age population)	87	100	108
Male	..	101	113
Female	..	99	103

Development diamond\*

Life expectancy

GNP per capita

Gross primary enrollment

Access to safe water

Armenia

Low-income group

KEY ECONOMIC RATIOS and LONG-TERM TRENDS	1977	1987	1997	1998	
GDP (US\$ billions)	..	..	1.6	1.9	
Gross domestic investment/GDP	..	..	13.0	14.7	
Exports of goods and services/GDP	..	..	20.3	19.1	
Gross domestic savings/GDP	..	..	-25.2	-19.2	
Gross national savings/GDP	..	..	-2.6	-12.6	
Current account balance/GDP	..	..	-15.8	-17.4	
Interest payments/GDP	..	..	0.8	0.8	
Total debt/GDP	..	..	49.0	43.5	
Total debt service/exports	..	..	5.6	7.7	
Present value of debt/GDP	..	..	27.7	..	
Present value of debt/exports	..	..	92.0	..	
	1977-87	1988-98	1997	1998	1999-03
(average annual growth)					
GDP	..	-7.7	3.1	7.2	..
GNP per capita	..	-10.5	8.3	..	..
Exports of goods and services	..	2.3	1.2	..	..

Economic ratios\*

Trade

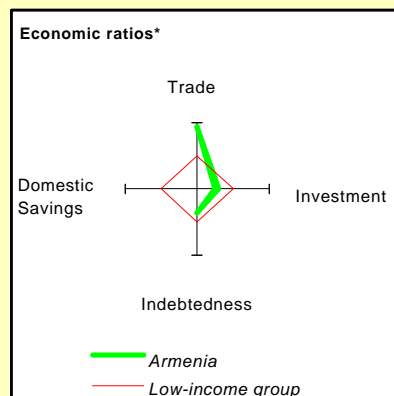
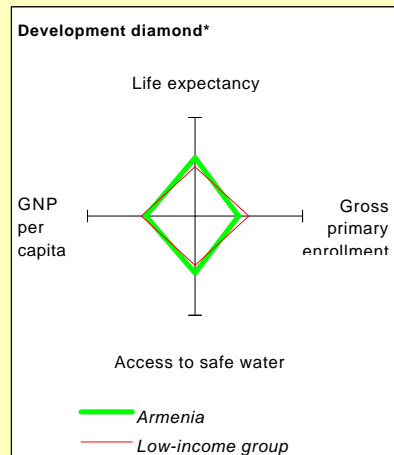
Domestic Savings

Investment

Indebtedness

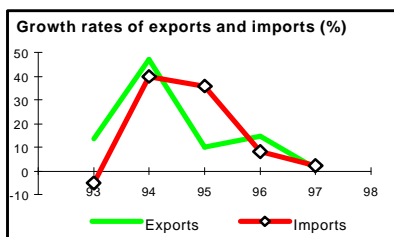
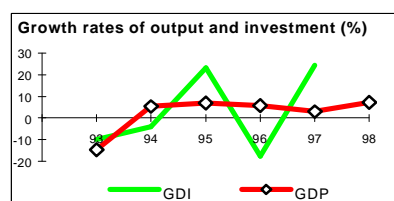
Armenia

Low-income group



#### STRUCTURE of the ECONOMY

	1977	1987	1997	1998
(% of GDP)				
Agriculture	..	..	33.3	34.2
Industry	..	..	26.2	24.0
Manufacturing	..	..	25.1	..
Services	..	..	40.5	41.7
Private consumption	..	..	112.3	107.3
General government consumption	..	..	12.9	11.9
Imports of goods and services	..	..	58.5	53.0
	1977-87	1988-98	1997	1998
(average annual growth)				
Agriculture	..	1.6	0.5	21.3
Industry	..	-14.1	3.7	12.1
Manufacturing	..	-13.1	3.3	..
Services	..	-10.8	4.5	..
Private consumption	..	-8.6	1.7	..
General government consumption	..	-2.1	4.4	..
Gross domestic investment	..	-10.9	24.3	..
Imports of goods and services	..	2.7	2.3	..
Gross national product	..	-9.9	8.6	..

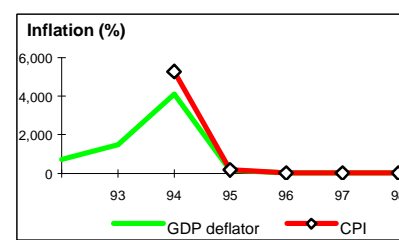


Note: 1998 data are preliminary estimates.

\* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

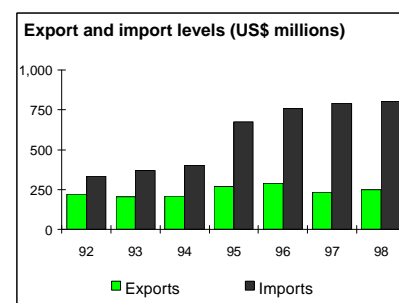
## PRICES and GOVERNMENT FINANCE

	1977	1987	1997	1998
<b>Domestic prices</b>				
(% change)				
Consumer prices	..	..	13.8	8.7
Implicit GDP deflator	..	..	17.3	11.2
<b>Government finance</b>				
(% of GDP, includes current grants)				
Current revenue	..	..	19.8	20.8
Current budget balance	..	..	-1.7	1.5
Overall surplus/deficit	..	..	-5.9	-4.3



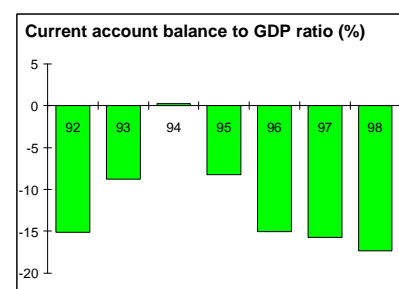
## TRADE

	1977	1987	1997	1998
(US\$ millions)				
Total exports (fob)	..	..	233	251
Gold, jewelry, and other precious stones	..	..	102	..
Machinery and mechanical	..	..	36	..
Manufactures	..	..	19	..
Total imports (cif)	..	..	793	802
Food	..	..	270	..
Fuel and energy	..	..	235	..
Capital goods	..	..	34	..
Export price index (1995=100)	..	..	..	..
Import price index (1995=100)	..	..	..	..
Terms of trade (1995=100)	..	..	..	..



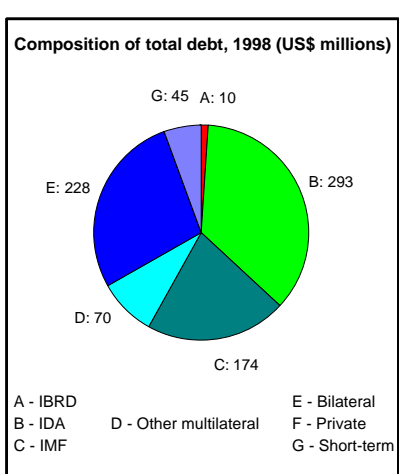
## BALANCE of PAYMENTS

	1977	1987	1997	1998
(US\$ millions)				
Exports of goods and services	..	..	330	357
Imports of goods and services	..	..	952	948
Resource balance	..	..	-622	-591
Net income	..	..	123	75
Net current transfers	..	..	242	188
Current account balance	..	..	-257	-328
Financing items (net)	..	..	316	331
Changes in net reserves	..	..	-59	-3
<b>Memo:</b>				
Reserves including gold (US\$ millions)	..	..	255	298
Conversion rate (DEC. local/US\$)	..	..	490.6	504.5



## EXTERNAL DEBT and RESOURCE FLOWS

	1977	1987	1997	1998
(US\$ millions)				
Total debt outstanding and disbursed	..	..	798	820
IBRD	..	..	11	10
IDA	..	..	254	293
Total debt service	..	..	28	37
IBRD	..	..	1	1
IDA	..	..	1	2
Composition of net resource flows				
Official grants	..	..	35	..
Official creditors	..	..	98	18
Private creditors	..	..	0	0
Foreign direct investment	..	..	51	221
Portfolio equity	..	..	0	0
World Bank program				
Commitments	..	..	107	125
Disbursements	..	..	77	43
Principal repayments	..	..	0	0
Net flows	..	..	77	43
Interest payments	..	..	2	2
Net transfers	..	..	76	41



## **Additional Annex 11**

### **ARMENIA: NATURAL RESOURCES MANAGEMENT AND POVERTY REDUCTION PROJECT**

#### **Social Assessment**

This Annex presents the key social issues relevant to the project objectives and specifies the projects social development outcomes. The project contributes to the following social development outcomes:

*Equity.* Labor intensive project interventions, such as tree planting, will offer poor villagers income-earning opportunities. New management regimes, particularly of high mountain pastures and community forests, will enhance the productivity of resources on which the poor are most dependent.

*Social Cohesion and Empowerment.* The project encourages development of community structures and their organizational capacity (such as watershed management boards and village user groups). It empowers beneficiaries by giving them a voice in natural resource management decisions by giving them a role in the development of park management plans and local infrastructure development.

*Transparency and accountability.* Institutional reform, decentralization, and local participation in developing resource management plans contribute to more transparent and accountable government and state management of land, forest and protected area resources.

#### **Methods**

Social analysis has been undertaken since the early stages of project design. A qualitative social assessment was undertaken from August - October 2000. This included in depth interviews with villagers and key informants as well as focus group discussions in the project area. A Quantitative Household Survey (QHS) was undertaken in 10 villages (300 households) in the project area in November 2000. Rapid rural appraisals (RRA) were undertaken in eight watersheds. In addition there were fact-finding and consultation sessions throughout project preparation. These include:

- Focus group meetings with consultants developing the project components;
- Consultations with national and local NGOs;
- Consultations with elected and traditional community representatives;
- Small, informal meetings with villagers in Gegharkunik and Tavoush;
- Larger consultation meetings with community groups;
- Meetings with government officials and employees from agencies responsible for agriculture, forestry, and protected areas;
- Stakeholder workshops based in Yerevan.

#### **Project beneficiaries**

The project beneficiaries are a homogenous group of cash poor subsistence farmers. The project is designed to improve the livelihoods of these farmers through an integrated program of interventions in agriculture, forestry, and protected areas.

The majority of project beneficiaries are poor. The QHS suggests the incidence of poverty in the project

area is much higher than the national average for rural households. The figures presented are only suggestive for two reasons. (1) 2000 was a drought year and (2) the methods used to calculate expenditures were in the QSA and ILCS were not identical. Analysis of the QHS indicates that between 65 and 72 percent of households in the sample of project villages live below the current expenditure poverty line (inflated to 12,339 ADR per capita per month). Preliminary findings from the 1998/99 Integrated Living Conditions Survey (ILCS) indicate that 51 percent of the rural Armenia population lives below the current expenditure poverty line (defined as 11,735 ADR per capita per month). Unfortunately the Marza level data on poverty is not available for comparison. Household size and altitude, which are close correlates of poverty, also appear to be above average in the project area (Table 1). Education, another close correlate of poverty, is also very low in the project villages. Only 28 percent of heads of household have greater than secondary education – which is the same level as the poor have in the country as a whole. Improving Social Assistance in Armenia (World bank, 1999) indicates that 25 percent of the poor nationwide have greater than secondary education.

Table 1: Poverty Indicators (Quantitative household survey)

	Rural Tavush (6 villages, 180 hh)	Rural Gegharkunik (4 villages, 120 hh)	Rural Armenia
Poverty Headcount	72%	65%	51% <sup>1</sup>
Household size	4.7	5.2	4.32
Farm Size (ha)	1.5	1.9	1.33
Altitude (meters) <sup>4</sup>	1950	2100	1800

1 Armenia Poverty Assessment Concept Paper, 2001

2 State Institute of Statistics, 2000

3 UNDP – Statistical Survey of Agricultural Farms, 1997

4 Staff Assessment

The target population, which has slightly larger farms than the national average, relies heavily on the natural resource base for its livelihood. The primary activity of approximately 70 percent of rural households is subsistence farming, with small amounts of agricultural surplus bartered in local markets. The most important source of income (self-consumption, cash, barter, and processing) is crop agriculture (Table 2), but only about 10 percent of the surveyed population engages in cash sales of their agricultural production. The most commonly grown crops are potatoes, beans, and wheat. The most common livestock are cattle, pigs, and sheep. Remittances, pensions and day-labor (other income) provide the primary source of cash to buy goods and services. Thus the majority of farmers are cash constrained and are unable to invest in their land. It is likely that households under report or simply do not report income from forestry activities because, depending on the situation, these may be considered illegal.

Table 2: Composition of Household Income\* in Project Area

	Tavush	Gegharkunik
	Non-poor	Poor Non-poor
Crop income	35 %	35 % 41 %
Livestock income	28 %	17 % 26 % 15 %
NTFP income	2 %	3 0% %
Other income	36 %	45 % 33 % 43 %
Income (ADR per year)	638,662	349,510 949,900 364,030

Source: Quantitative Household Survey.

\* Includes self-consumption, cash, barter, and processing.

### ***Beneficiary Priorities***

The project design responds directly to the beneficiary's development priorities. For the poor, 33 percent identify agriculture and 20 percent identify reducing unemployment as the most important development priority. For the non-poor, 34 percent identify agriculture and 20 percent identify irrigation as the most important development priority. Within agriculture the non-poor emphasize technology, such as agricultural equipment or improved livestock. The poor emphasize cash for inputs, such as rental of agricultural equipment or purchase of animal feed.

The project design directly addresses these priorities by coupling short term employment opportunities with long term technical assistance packages. Poor farmers will be paid during implementation of watershed rehabilitation and forestry programs. They will then have the opportunity to invest their earnings in increasing the productivity of their agricultural land. Specific activities involving labor intensive works include tree planting, construction of pasture watering points, rehabilitation of agricultural roads, fertilization of community pastures, and community forest enrichment, planting and protection

Watershed and forest rehabilitation activities were designed to target the poor through self-selection during implementation. The maximum number of low-wage jobs are created by specifying, where appropriate, in the selection criteria for procurement that preference will be given to proposals that are labor intensive and use labor from local villages. Concerns have been raised about the possibility that some poor households may not participate in the rehabilitation program because they will lose their eligibility for welfare payments. This is because the formula used to determine eligibility for welfare is based, in part, on income. This is not considered a problem because: (1) individuals so far below the poverty line that income from village watershed rehabilitation programs will not push them above the line will continue to be eligible; and (2) poor individuals not eligible for welfare [errors of omission] will be eligible to participate in activities that require community labor.

Poor and non-poor alike feel that they are not able to do anything to rehabilitate their land and improve it. The reasons cited include lack of money and lack of access to information and extension services. There are significant differences between the poor and non-poor. Poor households appear to be more likely to feel incapable or powerless to make any changes, and overall are less informed. The project design provides technical knowledge through extension and facilitates access to capital through grant programs. It increases empowerment through participation and dissemination of information through training and extension. The combination of income from implementation of community programs, improved resources productivity, and adoption of improved agricultural technology will eventually enable poor farmers to produce a surplus and improve their living standards.

The project also addresses the priorities of the people living in the vicinity of forests. These people are well aware of the deterioration of forest resources. In some villages residents are actively trying to identify water-feeding boundaries and strictly refrain from cutting in those areas. Rural populations are concerned that the Forestry Administration and timber industry are ignoring problems that are very important to them and they often feel unable to influence the course of events. The technical assistance packages within the forestry component are designed to increase farmers control over these resources and provide them with the knowledge to manage them more productively. Members of village communities will benefit from increased opportunities for legal, paid work in the forest enterprises, and in replanting activities. Proposed changes in leasing arrangements and the forest code also means that communities and individuals are able to undertake long-term leases of forest land, and manage the forest themselves. Community members will have access to a professionally trained forest extension service to assist them with forest management and rehabilitation on

a professionally trained forest extension service to assist them with forest management and rehabilitation on community land. Direct benefits from legal and monitored access to forest will include increased access to fuel-wood through better management of non-commercial thinning and other forest management activities. Cattle grazing in the forest may be allowed in certain places, and access to pastures should be improved through better management of forest paths and roads. Access to and management of non-timber forest products will be improved.

Institutional strengthening and other enabling framework activities within the Ministry of Nature Protection and Hayantar, as well as the Forest Research and Extension Center will benefit both staff and the wider community. The forest users and workers will benefit from enhanced extension services, and particularly from improved ability of staff to interact with communities, encourage participation and assist in conflict resolution. This should also reduce the levels of distrust of such institutions currently articulated by villagers. Support to user groups and existing decision making structure will enable them to become more transparent institutions, which are more representative of their constituents. This will increase the voice and power of the poor. Training and awareness raising will inform and educate local people about forest and other resources. Access to justice - an improved system of monitoring and enforcement should provide people with better access to justice in terms of fair and equitable management and benefits from communal resources.

### ***Vulnerable Groups***

There are three potentially vulnerable groups in the project area. These are refugees (Armenians from Azerbaijan), households where adult males migrate to Russia in search of seasonal employment, and people that rely heavily on the protected areas for subsistence.

Refugees have similar land resources to the rest of the population but are often less skilled in agriculture. They will be given equal opportunity to engage in watershed rehabilitation programs and technical assistance packages. Because they are less skilled in agricultural production they are expected to derive significant benefits from the technical assistance packages.

The qualitative social survey indicates that there are high migration rates in the project area, with men often leaving the household for the summer months in search of seasonal employment in Russia. The project may reduce the incidence of migration by providing new local employment opportunities and is also expected to increase the employment opportunities for women, who will be given equal opportunities to participate in the implementation of village investment programs.

A number of people may rely on the natural resources in protected areas (Dilijan and Sevan) for subsistence purposes. The exact number is unclear as households are largely unwilling to discuss their activities in these areas and the QHS indicates that non-timber forest products make up only a small percentage of household income. Nonetheless, there is a risk that protected area management plans may require some restrictions on these activities. The peoples concerns and rights will be addressed through the participatory protected area management planning activities. A detailed description of participatory activities is provided in the description of project component 3. In particular, these plans will emphasize rationalization of subsistence user rights. Furthermore grant resources designed to encourage biodiversity conservation will be made available to these people through the project to make sure that they do not suffer from any restrictions in access to forest areas during rehabilitation. If the participatory management plans result in involuntary restrictions on subsistence resource users, a process framework consistent with World Bank Operational Policy 4.12 will be developed and implemented as part of the management plan.

There are small populations of semi nomadic ethnic minorities living in Armenia – the Yizidi – whose

There are small populations of semi nomadic ethnic minorities living in Armenia – the Yizidi – whose livelihood is based on grazing animals in high pasture. However, there are no Yizidi living or grazing livestock in Tavush and Gegharkunik Marza. The qualitative social assessment did not find any minorities in the project area and this was confirmed by Hamlet Sargsyan, expert in ethnic minorities in Armenia and contributor to the recently published book “National Minorities of Republic of Armenia Today” (Yerevan, 2000).

### ***Social Risks***

There are potential social risks associated with the project. These include an unwillingness to adopt new production technologies, difficulty in finding markets for agricultural surplus, and obstacles to formation of successful community level organizations.

Beneficiaries may not be willing to adopt new production technologies. Less than 20 percent of the population currently uses extension services. Many consider that they do not need advice but others feel that they would not be able to implement the advice even if they received it. This poses a real challenge for the project to change attitudes and to introduce viable propositions that would awaken people’s perception to the potentials of improved technologies and sustainable resource use. The project minimizes this risk by promoting on-farm technology demonstrations.

Beneficiaries may have difficulty in finding markets for their agricultural surplus. Fifty eight percent of respondents indicated that they do not sell their production. For those families that are selling some of their production, marketing is considered a major problem. The main problems include the distance from markets (access), no local wholesale buyers and low prices. The project addresses this issue by supporting collaboration with existing initiatives.

While the project will work with existing village councils, it may sometimes be difficult to initiate new activities such as watershed management planning. In some villages the degree of unification is rather high (as a result of kinship) and there is previous practice of joint activities. The population arrives easily at an agreement on certain issues, the interest of the community is not ignored and there is readiness to invest into solution of problems essential for the community as well as into activities aimed at improvement of natural resources and their management. Comparatively poorer communities were less active and more skeptical than wealthier communities. Entrepreneurial spirit and commitment differed from community to community: in communities that had received assistance from international organizations certain functioning groups were already shaped and these villages were more active than those that had received less attention during the years of crisis. Still the communities perceived the objectives of the project with much hope and optimism and expressed willingness to assist them.

### ***Participation***

The project has been developed in a participatory manner and these activities will serve as a template for implementation.

The watershed management component villager needs were addressed by developing activities (Menu of Options) during the Participatory Planning Workshops (PPWs). RRAs and PPWs identified existing collaborative experiences (for example, agreements to use public lands, or experience at conflict resolution), level of kinship between the members of one community, and kinship patterns between communities on one watershed. Villagers then expressed their willingness to invest into project activities, take initiative, and work to solve their problems during the workshops.



Participation is also an integral part of the forestry component. Government staff will receive training in the importance of community involvement, and in methods of encouraging and managing that involvement. It should be noted that this will constitute a major change in approach for the forestry sector in Armenia, and may take some time and considerable support and mentoring to implement. To support integration of more participatory processes, local or international experts as appropriate will provide training and guidance. The project will involve a change management process within the forestry-related institutions of Armenia. Replanting, for example, will all involve community participation in terms of species selection, priority areas for plantings, undertaking the work, and taking care of seedlings. Participation will also be involved in areas where natural regeneration is required. Regarding species selection, it should be noted, for example, that many communities expressed a preference for fruit trees. Others emphasized the importance of certain species for animal fodder.

Many civil society organizations and NGOs have an interest in the project. This includes an interest in active involvement in project activities, as well as opportunities for funding NGO activities. The involvement of NGOs has been actively sought throughout the project identification and design process, in accordance with the World Bank Good Practices 14.70 guide on involving NGOs in Bank-supported activities. There are a limited number of international NGOs working in Yerevan, and the focus of consultations has been on local NGOs. It is anticipated that some NGOs will take an active part in implementation of the project. Roles that have preliminarily been identified as suitable for NGOs include as implementing agencies for activities such as: (1) monitoring, (2) training, (3) awareness raising, (4) institutional capacity building e.g. supporting user associations in villages, (5) concrete poverty reduction activities in villages, and (6) forest management activities.

### ***Stakeholder Analysis***

Stakeholder analysis was carried out at an early stage of project development, and continues to be refined. An outline of key project stakeholders and the possible positive and negative impacts of the project are listed in Table 3.

Table 3: Key stakeholder groups and interests

Stakeholder group	Interest in project	Influence	Consulted?
Farmers, Subsistence protected area users, refugees.	+ Access to jobs, technology, training, small scale infrastructure. Productivity increasing investments. - May lose ability to access some high biodiversity areas and undertake illegal forestry activities.	Low	Yes
State Forest Employees	+ Employment, equipment and training. - Possible loss of income from illegal forestry activities.	Medium	Yes
Small-scale entrepreneurs	+ New business opportunities. - May lose out to larger companies.	Medium	No
Village Government Key Role: Implement watershed	+ Responsible for watershed management activities.	High	Yes

--	--	--	--

management activities.	- increased transparency perceived as threat.		
Hayantar State closed Joint Stock Company Key Role: Forest management and conservation.	+ Training and equipment, prestige. - Loss of benefits gained from illegal forestry activities.	Medium	Yes
Ministry of Nature Conservation Key Role: conservation of the forests and biodiversity. Manage Sevan lake.	+ Training and equipment, prestige. - Loss of benefits from illegal forestry activities.	High	Yes
Regional Government	+ Economic development of Marzes. - Loss of benefits from illegal resource extraction activities.	High	Yes
Environmental NGOs	+ Implementation of biodiversity conservation. - Perceive management activities as inappropriate.	Medium	Yes
Social development NGOs Key Role: Concern over resource use restriction.	+ Included in resource planning and consultation activities. - Project does not achieve social development goals.	Medium	Yes
Commercial forestry sector Key Role: Participation in forest management.	+ Increased opportunities for commercial forestry - Loss of benefits from illegal forestry activities.	High	No
Academic and Research Institutions	+ Increased funding available for applied research. - Vested interests in existing methods of forest management.	Medium	Yes
National citizens.	+ Poverty reduction and protection of natural resources. - Project has limited geographic focus.	Low/Medium	Yes

The project implementation will necessarily involve further participation from all the above stakeholders. A broad outline is recorded below:

Table 4: Key areas of Stakeholder Participation

Stakeholder Group	Stage of Involvement	Example Activity
Community members	Design and Implementation.	Employment in workfare program. Access to extension and training, participation in watershed, protected area and forest management planning.
NGOs	Design, implementation, monitoring and evaluation.	Carrying out training and awareness raising. Participation in watershed ,protected area and forest management planning Monitoring social and environmental impacts of project.

Local Government	Design, implementation, monitoring and evaluation.	Work with local communities to develop watershed management plans and implement them. Monitoring of social development outcomes.
Ministry of Nature Protection	All (as above)	Monitoring Hayantar and providing extension. Promoting new management practices on Ministry land
Hayantar	All (as above)	Management of forests. Involvement of local communities. Provision of extension services.
FREC	All (as above)	Undertaking applied research.
Private sector	Implementation	Implementing small works for watershed management component, protected areas, and forestry.

Attachment

Sites proposed for GEF interventions		
Marz	Gegharkunik	Tavush
1	2	3
Administrative center	Gavar	Ijevan
Structure of the Marz	5 sub-regions and 92 communities	62 communities
Size	4,055 sq.km	2,688 sq.km
Population and poverty level	Population 202 thousand of which 169 thousand live in rural area and 30 thousand refugees. Extreme poverty ranges from 30% to 70% depending on location.	92,000 thousand of which 73 thousand live in rural areas). Extreme poverty ranges from 30% to 70% depending on location.
Eco-systems Climate	Steppe Mountain steppe, Alpine meadows Wetlands around lake Sevan and lake Gilli At altitude of 2000m there were 110 days without rain, which resulted in 70% crop losses. Cool summers and long cold winters, snow up to 9 months High humus content soils	Forest Mountain Steppe Altitude range is 400 to 2800m. The Northeast agro-climatic zone is considered as dry under 800m of elevation. Between 800 and 1600m of elevation, it is relatively wet, warm, with mild winters. 5 months frost free months in Dilijan, 6 elsewhere Forest grey and red soils
Industrial activities	Formerly 70 industrial complexes in the marz, which employed 20,000 people. Now only 10 are in operation but at only 20% of capacity. (1) A private factory is due to open at Vardenis employing 170 staff to produce base compound for NPK fertilizer.	Very little. Some small wineries are being assisted to start up but the large winery at Ijevan is only running at 10% capacity
Agricultural activities	Much of the population has resorted to agricultural activities to avert starvation. Many have no idea of agriculture.  Rain fed agriculture. Production mainly focused on potatoes and cabbage. Increasing pressure on village pastures from livestock production, declining land productivity.	Much of the population has resorted to agricultural activities to avert starvation. Lack of knowledge and skills in best agriculture practices.  Production has mainly been concentrated on livestock, vineyards and orchards. Diversification into staple crops has taken place for subsistence purposes. Declining of land productivity is common in project sites ( Quality Social Assessment, World Bank 2000).
Land	79,000 ha of state reserve land which are available on lease to farmers, and 160,000 ha of community owned land, mainly grazing.  Land has been privatized but not all options have been taken up, mainly due to the lack of irrigation.	270,000 ha of land, most of it, 131,800 ha, covered by forests.
Intervention sites	Selected watersheds: Tchambarak, Martuni, Gavar; Lake Sevan National Park, and state forest land in Noyemeberyan, Tavoush and Sevkar.	Selected watersheds: Ijevan; Noyemberyan, Parakavar, and state forest land in Tavoush , and Dilijan State Reserve.
Biological diversity	On the territory of Gegharkunik there are 1507 species, 494 genera and 102 families of fanerogames( flower and seed producers) reported. It composes the Transcaucasus flora and 47% of Armenia flora. The area is rich in plants of economic significance which natural growth is threatened. Preliminary	Forested areas of Tavoush support a high diversity of plants and animals. The density of higher plants (100 spp/ sq.km) is one of the highest in the world. The area host important habitat of foxes, badgers, martens, rabbits, various kinds of sparrows, pigeons, and turtle-divers. Relict species of global significance

	Gavar; Lake Sevan National Park, and state forest land in Noyemeberyan, Tavoush and Sevkar.	Parakavar, and state forest land in Tavoush , and Dilijan State Reserve.
Biological diversity	On the territory of Gegharkunik there are 1507 species, 494 genera and 102 families of fanerogames( flower and seed producers) reported. It composes the Transcaucasus flora and 47% of Armenia flora. The area is rich in plants of economic significance which natural re-growth is threatened. Preliminary inventory of rare and disappearing plant	Forested areas of Tavoush support a high diversity of plants and animals. The density of higher plants (100 spp/ sq.km) is one of the highest in the world. The area host important habitat of foxes, badgers, martens, rabbits, various kinds of sparrows, pigeons, and turtle-doves. Relict species of global significance are found in the area: e.g. <i>Corylus colurna</i> .



## **Additional Annex 12**

### **ARMENIA: NATURAL RESOURCES MANAGEMENT AND POVERTY REDUCTION PROJECT**

#### **Protected Areas and Biodiversity Conservation**

*General background.* The establishment of the system of protected areas in Armenia dates back to 1958 when the state reserves Khosrov and Bartazi were created. In recognition of the global conservation importance of the unique alpine lake ecosystem of the largest freshwater reservoir in the Caucasus, the Lake Sevan National park was established in 1978 where nearly 60% of the species of the national fauna and flora are represented. The Law on Specially Protected Territories provides a legal framework for the establishment of the network of protected areas with an objective to conserve national natural and cultural heritage, including important habitats and species, landscapes and important geological formations. The protected area network covers a total area of approximately 1.416 km<sup>2</sup>, representing 5% of the national territory. Not considering the Lake Sevan National Park, the distribution of the protected areas on the national territory is strongly biased towards conservation of forests, while other systems are not as well represented. These figures, however, do not take into account the fact that only a small part of the state reservations have been actually established on the ground.

The protected areas network includes five state Reserves, 22 state reservations and 1 national park. State reserve corresponds to the "Strict Nature Reserves" category according to IUCN criteria. Reservations allow economic activities, but only those listed in existing regulations which prevent ecological damage.

The system of protected areas fall under the jurisdiction of the Ministry of Nature protection, Ministry of Agriculture and Ministry of Education and Science. An institutional capacity assessment of institutions in charge of protected area management and conservation of biodiversity, was carried out during project preparation and identified several key areas of improvement:

- Shifting the historic focus of protected areas management from largely forestry and restricted visitor activities, to one based on ecosystem management, greater stakeholder participation, and multiple uses that are compatible with the primary goal of conserving globally important biodiversity;
- Adoption of a better mandate and service attitude, which reorients the MoNP and its protected areas as a visitor-friendly agency charged with facilitating people's enjoyment of, and education about, protected area resources;
- Developing activities to generate income for local communities and public sector management of the protected areas, based on updated protected area management policies and practices and development of capacities in marketing, public outreach and service delivery;
- Improved communication, coordination, and collaboration with other sectors (agriculture, forestry, culture, tourism, urban development, finance) whose cooperation is essential to the MoNP's success in protected area management and biodiversity conservation; and
- Developing a stronger organizational identity and local and national profile that would help develop better understanding of cultural and natural heritage and encourage increased visitation.

*Importance of biodiversity.* Armenia is extremely rich in variety of both biodiversity and landscapes reflecting the variety in geology and altitudes found within the country. Some 3500 species of vascular plants have been recorded, giving the density of higher plants (100 spp/sq. km., which is one of the highest



in the world. Tens of thousands of lower plants and bacteria species have been recorded. More than 17,500 species of animals including 500 vertebrate species have been recorded. Of particular importance are the agricultural species, which represent wild relatives of crops and agricultural varieties. Forest habitats have an important ecological role although they cover less than 10 % of the country territory. Because of natural and human impacts almost half of the plant species present in Armenia may face some threat of extinction. To date 35 plant species of economic importance are known to become extinct. Further 386 ( 12% ) of the flora are listed in the Armenia Red Data Book( 1998). At the regional level 61 plant species are registered as of critical concern. Species such as sweet flag bulrush (*Acorus calamus*), a valuable medicinal herb and the Judas Tree (*Cercis griffithii*) are considered endangered because of agricultural use of land. A total of 99 vertebrates are currently listed, of which 39 are considered internationally threatened. These include 12 amphibians and reptiles, and 17 mammal species. Among the mammals listed, six species are at particular risk of extinction: Armenia mouflon ( *Ovis Orientalis gmelinii* ) wild goat( *Capra aegargus*), marbled polecat (*Vormela peregusna*), European otter(*Lutra Lutra*) Brown bear (*Ursus arctos*) and manul (*Felis manul*).

Armenia is a global center for genetic resources of wild wheat, rye, barley and aegilops species. Many species of wheat, which originate from Armenia, have spread all over the world. Rare tertiary relics include species such as rosebay and hazel nut.

*Threats to Biodiversity:* Threat results directly and indirectly from human activities. Broadly, the key threatening processes include: (i) habitat loss and modification; (ii) over-use of biological resources (iii) effects of introduced and non-native species; (iv) climate change impacts. More specifically, human impacts (over-use, over-collection) include: overgrazing of pastures and meadows, loss of forest areas through destruction and reduced regeneration of forest ecosystems, and decline of medicinal plant species.

Current problems to biodiversity protection include:

- Budget limitations and general lack of financing as a result of the economic crisis,
- Lack of technical equipment and material, and vocational training
- Funding of the Action Plan or the National Biodiversity Strategy and Action Plan has not been mobilized although the funds have been budgeted; forestry activities included in the Action Plan are not implemented due to lack of funding,
- Several project proposals on threatened plant species are waiting for funding,
- Loss of wetland habitats of migrating birds: due to the sinking water level of Lake Sevan, and the loss of Lake Gilli, only 50 out of 150 species remain,
- Some 20,000 ha of mainly central and southern oak forests are affected by pests and diseases, while pine and poplar plantations around Lake Sevan also have serious health problems,
- Inventory and monitoring of ecological networks are not put in place; the system of ecological networks has not been completed
- Staff payment arrears and declining motivation of staff,
- Low public awareness of biodiversity issues,
- Biodiversity conservation is still understood as flora conservation; the ecosystems approach is only slowly emerging in the context of conservation and sustainable use of high mountain ecosystems' biodiversity, and also in the context of threatened wetlands and desert ecosystems;
- Degraded alpine pastures, meadows and forests needs urgent protection.

A major weakness to revert current trends is the fact that the implementation of Biodiversity Strategy and Action Plan of 1999, which is a key instrument for the national implementation of the Convention on Biological Diversity, has not effectively started. In addition, the funding of the BSAP is not secured although it would be of vital importance to launch and complete the implementation of the BSAP and its

provisions.

*Protected Areas Issues.* The definition of respective roles and institutional responsibilities of the Forestry Department and the Department of Protected Area is matter of priority. Lack of management and planning capacity significantly limits the effectiveness of the whole protected area system and many reserves remain protected only on paper. Public resources for conservation and protection are under severe constraint. State budget meets less than 35 % of the needs for biodiversity conservation funding. The operation costs of the MNP in 1998 were US\$ 980,000 or 0.3 % of total public expenditure and 0.06 % of GDP.

Activities occurring within the limits of the existing protected areas in many cases are not consistent with the site management objectives. An illustrative example are urban developments occurring inside the Dilijan Reserve and unregulated activities within the boundaries of the Lake Sevan Park which threaten sites of high international importance for the conservation of endemic wild relatives of domestic crops. Lack of enforcement in the buffer zones around the protected areas is resulting in a significant loss of natural habitat. Demarcation and fence once protecting the reserves from illegal interventions (logging, grazing) has now disappeared making protection of the sites impossible.

Agriculture remains the largest sector in Armenia as almost half of the productive land is under agricultural use. As such the agriculture is a key sector for natural resource use and has the highest impact on biodiversity. Key impacts include: habitat change and destruction of natural ecosystems; land degradation and reduced fertility, soil erosion, over grazing affecting vegetation cover composition, loss of valuable species.

There is no pasture management system at place. Although overgrazing is concentrated on pastures near villages, some alpine meadows are also under unsustainable pressures. At the same time, significant areas of remote alpine meadows are under-utilized. Alpine meadows are semi-natural managed ecosystems that often have biodiversity of global importance. Their plant compositions are results of centuries of interaction between traditional agricultural activities such as grazing and mowing, and their maintenance needs constant human intervention. Due to difficult access, many of these meadows are no longer used, their unique plant compositions are changing, and they will lose their global ecological value.

Privatization of land resulted in changes of land use patterns; lack of alternative environmentally sustainable sources of income of socially deprived population and low public awareness are additional factors of biodiversity loss. Lack of active regulation regimes to reduce pressure of resources could result in greater and irreversible losses of wildlife.

Social and economic transition problems lead to changed relationship between society and nature many of which resulted in increased pressure particularly on biodiversity. The project will consider biodiversity conservation in the context of the impacts and opportunities of the new economic and social challenges.

**Systemic failures leading to biodiversity loss in Armenia include:**

- i) policy failures disincentives resulting in illegal logging and overgrazing, and lead to direct over-exploitation of biodiversity at local community level, failure of market policies to account for the social costs of biodiversity
- ii) market failures, that encourage hay-making, pig breeding and cattle breeding, and consequently provoke habitat conversion from forest to pasture around villages, often on erosion-prone slopes, including those located in protected areas and their buffer zones (although sustainable hay-making and cattle breeding can have positive impacts on biodiversity of meadows, while pigs may contribute to the regeneration of beech forests);

- iii) institutional failures that at local community level encourage poaching, unsustainable collection of medicinal, edible and decorative plants, as well as illegal hunting and fishing, hence providing direct causes to destructive harvesting practices and use of wood and non-wood forest resources root. Issues like corruption, immaturity of democracy, lack of confidence in authorities, conflicts between central and local level interests need are being addressed at national level;
- iv) livelihood circumstances (including lack of alternative environmentally-sustainable sources of income), where rural people have no normal access to salaries, food, clothes, social services, etc., i.e. the social deprivation that encourages survival at any price, and provoke uses of forests accessible to them in such a way as to degrade it and increase the risk of species and habitat extinction (root: social injustice and poverty).

### ***Lake Sevan Park***

Lake Sevan National Park (1,500 sq.k) located in Gegharkunik is directly under the Ministry of Nature Protection. Lake Sevan Park has been identified as one of the starting points for biodiversity conservation and management in forest areas in the Lake Sevan Rehabilitation Program. Forests in the Lake Sevan water catchment area play a significant protective role in soil and water conservation.

Status. The Government Resolution No. 125 of March 1978 defined the boundaries of the park management area. The actual establishment of the park and responsibilities for its management was assigned by Government Resolution No. 23 of January 26, 1996, containing the National Park Charter, provides the framework for the development of effective management. However lack of resources held back the implementation of solutions to issues that hampered park activities for a long time.

Socio-economic features. First settlements in this territory date back to the 7,000 B. C. The cliff drawings of hunting scenes of the early Stone Age, the ruins of citadel date back to the 6th century B. C., early Christian shrine and funerary steles of 4th century in the Noradus, church and monastery of 9th century on the Sevan Peninsula attract the tourists interested in archaeology, architecture and history. The Gegharkunik Marza hosts 277,000 people in 92 communities, of which 38% live in four major towns around the lake. Population density is 52 inhabitants per km<sup>2</sup>. The main economic activities in the basin are commercial fishing and agriculture. Illegal and relatively unregulated extraction of natural resources such as fish, forest plantations around the lake, and various non-timber products, is a serious problem. Tourism around the lake is still a significant economic activity during the summer months although much reduced from pre-1991 levels. New investment in hotels is occurring and there is modest potential for eco-tourism in selected regions such as the Artanish peninsula. One issue hindering further tourism development is the preponderance of illegal and abandoned structures (including many old, unsightly and unfinished hotels) within the park and in the buffer zone. Zoning in the park is not efficient with many commercial agriculture areas being included, while areas of high biodiversity are within the buffer zone and not the park itself. The high level of population and economic activity in the lake basin has brought associated pollution and soil erosion, and subsequent environmental impacts on the lake ecosystem. Since the collapse of most industries in the region, the major sources of pollution at this time are residential and agricultural. A more critical concern is the severe change in aquatic ecosystems from the 20-meter decline in water levels over the past forty years, mainly for irrigation, hydro-electric generation, and to expand agricultural land bordering the lake. This decline has altered hydrological patterns and increased eutrophication, changed fish species and reduced spawning habitat, wetlands, and recreational values and lowered drinking water quality. While some data suggest that the lake level is stabilizing, there is still some uncertainty surrounding measurements of water inflows, outflows and the future lake level.

At present potato, cabbage and grain farming is the traditional form of land use at the altitudes of 1900-2200 m a. s. l. High-mountain steppes, sub alpine and alpine meadows are used for haying and summer pasture. The area has great potential for recreation and tourism development.

**Fauna.** Investigations on invertebrates include only aquatic fauna: 14 plankton and 136 benthic species of different systematic groups. The fauna of vertebrates consists of 6 species of fish (2 in the Red Book of Armenia), 4 species of amphibians, 18 species of reptiles (2 in the Red Book), 210 species of birds (36 in the Red Book), 36 species of mammals (8 in the Red Book). 2 species and 1 subspecies of fish (*Salmo ischchan*, *Barbus goktschaikus* and *Varikorhinus capoeta sevangi*) are endemic. The famous *ishkhan* (*Sevan trout*) is now at the edge of extinction because of drying of spawning areas, pollution and poaching. Acclimatized white fish (*Coregonus lavaretus*) gives at present 90% of total fish harvest (1,000-2,000 tons per year). Amphibians are available in all small ponds. Of them European marsh frog (*Rana ridibunda*) and European green toad (*Bufo viridis*) are common. The water related herpetofauna consists of common (*Natrix natrix*) and water grass-snakes (*N. tessellata*). Water-level decrease influenced first of all on the quantity of waterfowl. From approximately 60 breeders only 25 were registered during the last years. Eurasian coot (*Fulica atra*), mallard (*Anas platyrhynchos*) and endemic Armenian gull (*Larus armenicus*) are abundant at present. The lake serves as an important passage for migratory birds. Such rare birds as great white egret (*Casmerodius albus*), glossy ibis (*Plegadis falcinellus*), whooper swan (*Cygnus cygnus*), demoiselle crane (*Grus vigro*) are registered here regularly during the migrations. The most typical mammals of the Lake Sevan Basin are hare (*Lepus europaenus*), fox (*Vulpes vulpes*), weasel (*Martes foina*), several species of rodents. Among the mammals ecologically dependent on the wetlands the European otter (*Lutra lutra*) became extinct in the recent decades.

**Flora.** The biological diversity of plants is extremely high. Approximately 1600 species of vascular plants have been registered in the basin of Lake Sevan. Among them there are 48 species registered in the Red Book of Armenia, 5 are endemic (*Acantholimon gabrieljanae*, *Alyssum hajastanum*, *Astragalus shushaensis*, *Isotis arnoldiana*, *I. sevangensis*) and have never been recorded outside of the Lake Sevan Basin. The most characteristic arboreal plants of natural communities are junipers (*Juniperus oblonga*, *J. polycarpos*, *J. Sabina*, *J. depressa*). The remains of the oak forests occur on the northeastern part of the basin. Sweetbrier (*Rosa canina*) is common everywhere. Artificial forests surrounding the lake are composed of pine (*Pinus caucasica*), poplar (*Populus canadensis*, *P. simoni*), acacia (*Caragana brevispina*, *C. frutex*), willow (*Salix viminalis*). The sand back thorn (*Hippopae ramnoudes*) forms almost impassible bush. Bogs and ponds are covered mainly by reeds (*Phragmites*), sedges (*Carex*), duckweed (*Lemna*). Thickets of moss, *Chara*, *Spirogira* as well as Potamogeton cover the bottom of littoral zone of Lake Sevan. More than 300 species of algae had been recorded in the plankton.

### ***Dilijan State Reserve***

**Status.** The Dilijan reserve (280 sq.k) located in Tavoush Marza was established as a state reserve in 1931 through the forestry parastatal to preserve beech forests from cutting imposed by the former Soviet Union. According to the Armenian law “*State Reserves are established to ensure highest degree of protection of important habitat and species. Human activity is limited to scientific research*”. The reserve is located in the Northern Armenia mountain ranges of Pambak, Areguni, Ghugark and includes the watersheds of Agstev and Getik rivers. The topography is largely mountainous with altitudes ranging from 1,000 to 2,900 meters. It was under the management of Hayantar until 1988, when the management responsibilities were transferred to the Department of Protected Areas of the Ministry of Nature Protection. As a State Reserve, no activities are legally permitted other than scientific research.

Socio-economic features. The Marza population is 156,000, with an estimated 30,000 living within the Reserve in the town of Dilijan, and a number of smaller villages. With the collapse of the industrial economy following Independence, socio-economic activity has declined. Tourism was a large industry prior to 1991 with a significant number of health spas, rest homes and hotels located in the region. Many old structures are now abandoned and a growing number of new structures have been built illegally within the Reserve. In addition, Dilijan was a substantial industrial center until 1991 and many of the production facilities now lay abandoned. Major transportation and energy corridors still pass through the center of the Reserve. The main activity in rural areas at present is grazing on open pastures and subsistence agriculture. Illegal logging, both for subsistence fuelwood and commercial sale, is a serious problem. Local fuelwood requirements are an estimated 45,000 m<sup>3</sup> per year, which is already at the limit of the annual allowable cut from all accessible forest areas in the Reserve. Wood is burned in small metal stoves and inefficient open hearths. Certain parts of the region have high potential for eco-tourism development with its natural beauty, variety of ecosystems, and scope for low-impact hiking, camping, etc. Another critical issue is the proposal by GOA to change the status of Dilijan State Reserve. The planning process will resolve whether the present status of Dilijan State Reserve should be changed to a National Park.

Dilijan is a priority area for the creation of wildlife corridors, which include the creation of transboundary wildlife corridor between Armenia and Georgia in the Noemberjan region. The corridor will protect forest areas between Dilijan reserve in Armenia and the Borjomi state reserve in Georgia.

The territory of the reserve is also well known for its national recreational resources. Since the 1930s different kinds of health care, recreational and tourism facilities have been established. A wide spread opinion in Armenia is that in forest poor and dry Armenia, even after granting a status of the State Reserve, it would be illogical from the socio-economic point of view, not to use rich and diverse recreational resources of Dilijan.

Biodiversity richness. The area of “Dilijan” State Reserve is unique for its rich biological diversity, landscape and medicinal water resources, natural and historical and cultural monuments, and is considered as priority health resort region. One could find here such endemic and rare animal species as Caucasian mole, badger, weasel, beech marten, lynx, wild cat, wild boar, roe deer, squirrel, and other, and plant species such as orchids, iris, fritillaries, peat moss, Cornelian cherry, barberry, tulips, *Dactylorhiza iberica*, *Epipactis*, *Epipogium aphyllum*, *Lilium armenium*, *L. szovitsanum*, and *Gladiolus*. In the reserve grows also rich genetical fund of wild relatives of crop plants (about 100 species), as well as wild edible and other purpose plants, which are becoming relict or in some cases disappearing. Dilijan State Reserve is a unique forest ecosystem, which hosts 900 species. There are 40 unique, rare and endangered species in the Reserve, of which 29 are in the Armenian Red Book. The Reserve hosts 27 Caucasian, 25 Armenian, 18 Trans-Caucasian, and 3 South Trans-Caucasian endemic species. In addition the area is rich for its cultural heritage amenities, which together forms unique ecosystems with significant potential for developing eco and natural heritage tourism. The area has diverse cultural and historical heritage which include a number of monuments: Haghartsin (X-XIII century), Goshavank (XII-XIII), Jukhtak monastery (XI-XIII), Matosavank (X-XIII), Akhnabat church (XI).

Main issues. The area is mainly of beech and oak Mesophyll Forest typical for the Caucasus region. After more than forty years of total protection, a large number of timber stands are over-aged and overstocked. Poor management of present protected area status imposes constraints on any type of silvicultural improvements and active conservation. In reality, only small portion of the reserve have enjoyed a significant degree of protection, while large areas have been affected by human activities: illegal timber harvesting and collection of non-timber forest products is under way and the area is used for grazing and haymaking.

Uncontrolled urban developments threaten the integrity of the protected area and call the need to revise the boundary and zoning schemes. Proposals have been made to reconsider the former decision on the protection of the whole area. The lack of buffer zone is resulting in significant losses of natural habitat.

Impact factors include:

1. Existence of 5 villages in the buffer zone of Dilijan reserve, geographical location of agricultural and other holdings allocated or leased to them were ignored while establishment of the Dilijan preserve. This caused generation of smaller isolated islands of holdings of active commercial activities. Their use made a strong direct or indirect impact on regular operation of the reserve. Cottages and cattle-breeding farms of other settlements are located in the areas close to the reserve. Simultaneously, these villages for their domestic purposes encroach on reserve forests, which leads to a multi-nature process of bi-lateral offenses.
2. A number of inter-state and in-state transport infrastructure and inter-village roads are passing through the territory of the Dilijan State Reserve and the impacts of noise, deforestation, pollution, transport accidents are inconsistent with a reserve regime.
3. The territory of the Dilijan State Reserve by its landscape and resort resources, unique natural and historical-and-cultural monument considered is a popular resort in Armenia.

## **Additional Annex 13**

### **ARMENIA: Natural Resources Management and Poverty Reduction Project**

#### **Process Framework for Mitigating Potential Adverse Livelihood Impacts**

**Project Description.** The project objective is to improve natural resource management and alleviate rural poverty in the hilly and mountainous areas of Tavoush and Gergharkunik. Project components are as follows: (1) Community-based watershed management; (2) Improved State Forest Management; (3) Protected Area Management and Biodiversity Conservation; and (4) Project Management and Implementation Support.

**Protected Area Management and Biodiversity Conservation Component.** This component supports preparation and implementation of protected area management plans in the Dilijan State Reserve and Sevan National park, ecosystems conservation in the broader watershed, and significant capacity building. Benefits include models for enhanced ecosystem management and biodiversity conservation for Armenia's national system of protected areas, which include the participation of local communities, and opportunities for sharing experience with other Caucasus countries. Specifically this component supports three activities:

1. Preparation and implementation of protected area management plans and monitoring systems for Dilijan and Sevan. The management plan for Dilijan Reserve will focus on maximizing biodiversity conservation with special attention to resolving two problems that now contribute to degradation of globally important forest and range ecosystems: Unmanaged livestock movements and illegal natural resource uses. The planning process will also guide a government decision to shift the status of Dilijan from a State Reserve to a National Park. For Lake Sevan, the management plan will improve the conservation of this strategic aquatic ecosystem and surrounding range and forest ecosystems.
2. Strengthening national and local institutional capacity for protected area management, including revision of key enabling legislation and regulations, updating the Red Book, and training.
3. Information dissemination and public communications on Armenia's biodiversity, support to a biodiversity assessment at the watershed landscape level, and transboundary cooperation in ecosystems monitoring and conservation in the South Caucasus.

There are a small number of people living in close proximity to Dilijan and a large number (277,000) living in close proximity to Sevan. The exact number that rely on natural resources for subsistence purposes is unclear. Households are largely unwilling to discuss their extractive activities because most extractive activities are actually illegal under the current laws governing Dilijan and Sevan. Qualitative and quantitative interviews indicate that non-timber forest products make up only a small percentage of household income. The single most important household use of park resources in Dilijan appears to be for fuelwood. In Sevan collection of sea buckthorn and fishing are important activities in some communities.

There is a risk that protected area management plans may require some new zoning and increased enforcement of existing laws on activities in certain zones of the protected areas identified in the management plans that host globally important biodiversity. For example, there may be various restrictions placed on grazing, fuelwood and timber extraction, fishing and hunting.

The peoples concerns and rights will be addressed through the participatory protected area management

planning processes for Dilijan and Sevan. In particular, these plans will emphasize rationalization of subsistence user rights. Furthermore, grant resources designed to encourage biodiversity conservation will be made available to communities through the project to make sure that they do not suffer from any restrictions in access to sustainably managed natural resources.

The management plans will define more effective zoning based on sound scientific knowledge and updated inventory and maps. The plans will also acknowledge that these protected area management plans must be tools to address a wide variety of demands and values (biodiversity, human, cultural, socio-economic) while addressing the primary goal of conserving globally and nationally important biodiversity. The expected outcomes include: (i) implementation of new management plans in consultation with local and national stakeholders; (ii) rationalized zoning plan to accommodate multiple uses in the protected areas; (iii) development and implementation of carefully managed and low-impact economic activities such as eco-tourism, subsistence forestry, grazing, use of non-timber forest products, and fishing in certain zones within the protected areas; and (iv) implementation of appropriate management interventions at the site level, in consultation with local and national stakeholders.

The project will review the effectiveness of key laws and regulations governing these protected areas. Current legislation for Dilijan does not allow any activities other than limited scientific research. For Sevan, it allows some extractive and recreational activities. Ideally this review, which will take place in consultation with the communities living in close proximity to the protected area, will lead to changes that facilitate a reduction in illegal hunting, fishing and logging activities in selected parts of the protected areas. The expected outcomes include: (i) improved law enforcement and resource use monitoring (both by park staff and community members) within the protected area; (ii) improved scientific research and biodiversity monitoring carried out by the protected areas staff; and (iii) improved communication with communities living within and adjacent to the protected areas.

The project will support community programs to build local awareness of the protected area's management and encourage participation of local communities in the project. The specific outcomes would include: (i) development of appropriate approaches and education materials for community participation and outreach, and general awareness raising; and (ii) implementation of local environmental awareness programs (community participation programs, local school curricula, etc.)

**Policy Trigger.** This Process Framework will be implemented in accordance with World Bank policy on involuntary resettlement. It covers restrictions of access to legally designated parks and protected areas, which result in adverse impacts on livelihoods of the affected persons. Good practice has demonstrated that the objectives of the policy can be better achieved through a participatory process similar to that outlined in this Process Framework.

Armenia has several categories of protected areas. For State Reserves (such as Dilijan), activities other than research, are forbidden by law. In National Parks (such as Sevan), three broad zones dictate the type and scope of permitted activities. These zones are: a protection zone where no activities are permitted; a recreation zone where certain recreational activities are permitted; and an economic zone where activities such as forestry, grazing, fishing, and collection of non-timber products are permitted.

The protected areas component supports development and implementation of management plans for Dilijan and Sevan which focus on key activities to enhance biodiversity conservation and natural resource management, such as increased monitoring, and working with forest-dependent households and communities to develop and implement regulations and other measures to ensure sustainable utilization of natural resources. The component design does not require involuntary physical displacement or relocation



of people. Furthermore, to the extent feasible, the management plans will balance more effective enforcement of existing regulations to prevent loss of globally important biodiversity in protected zones, with improved and equitable access to appropriate economic zones where specific natural resources will be managed for sustainable subsistence use by local communities. In some cases, changes in zoning may adversely impact livelihoods. In other cases, zoning changes may actually increase opportunities for communities, as in the case in Dilijan, where changing the status from reserve to a national park may actually open up more collective forests for legal and sustainable use of fuelwood and selective collection of NTFPs. However, increased restriction of access cannot be ruled out until the management plans for these areas are developed during implementation, at which time the nature of any proposed restrictions, as well as the type of measures necessary to mitigate adverse impacts of those restrictions, would be determined in consultation with the project-affected groups.

**Process Framework.** This Process Framework outlines the criteria and procedures which will be followed as part of the project, in cases where project-induced involuntary restriction of access to protected area resources results in adverse livelihood impacts, to ensure that eligible, affected persons are assisted in their efforts to restore or improve their livelihoods in a manner which maintains the environmental sustainability of the nature reserve in question. More specifically, it describes the participatory process by which: (a) specific components of the project were prepared and will be implemented; (b) the criteria for eligibility of affected persons will be determined; (c) measures to assist the affected persons in their efforts to improve or restore, in real terms, to pre-displacement levels, their livelihoods (e.g., as appropriate, alternative grazing areas, cultivation of unique non-timber forest products such as mushrooms, or of other crops, or investments in community infrastructure) while maintaining the sustainability of the park or protected area will be identified; and (d) potential conflicts involving affected persons will be resolved. It also provides a description of the arrangements for implementing and monitoring the process.

Process Followed During Preparation. A full social assessment was conducted during component preparation. A sample of rural village households in selected “critical” communities in and adjacent to the nature reserves included under the project were interviewed. The objective of the SA was to: (a) assess the existing social conditions; (b) determine the potential negative impacts of the component, if any; (c) serve as a vehicle for community consultations on the component; and (d) inform the ongoing component design.

These people are well aware of the deterioration of forest resources. In some villages residents are actively trying to identify water-feeding boundaries and strictly refrain from cutting in those areas. Rural populations are concerned that Hyantar is ignoring problems that are very important to them and they often feel unable to influence the course of events. The results of the social assessment were used to design this component, enhancing positive impacts and mitigating likely adverse effects. Nonetheless, it is possible that some component activities could affect adversely the livelihoods of persons living adjacent to Sevan and Dilijan.

The preparation of the management plan is designed to avoid this problem. The social studies financed by the project will include consultations with local communities and NGOs. The purpose of these consultations, which will occur in all communities affected by proposed protected area management decisions, is to ensure that restrictions on resource use do not have an unnecessary adverse impacts on the livelihood of subsistence users. Particular emphasis will be placed on a consultation process that allows communities to identify and choose among potential compensating measures. These would likely consist of being given priority for access to resources in the new economic zones and new jobs created in and around the protected area (e.g. building trails, boundaries, forestry work). The consultations will also address mechanisms by which potential conflicts involving resource users can be resolved and develop strategies for participatory monitoring of beneficial and adverse impacts within the management area and the

effectiveness of compensating measures. The results of the consultations will serve as an input to the protected area management plans.

Process to be Followed During Implementation. The process to be followed during project implementation would consist of the following steps:

- (1) Consultations on the content of the management plans and any changes to the boundaries or management regimes will be carried out with the communities affected by park or reserve management decisions to ensure that changes in resource use do not have unnecessary adverse impacts on the livelihood of subsistence users.
- (2) If adverse impacts are unavoidable, then the consultations will focus on identifying measures to assist subsistence users to improve or restore their livelihoods while maintaining the sustainability of the reserve or park. Particular emphasis will be placed on a consultation process that allows communities to identify and choose among potential compensating measures.
- (3) The consultations will also address mechanisms by which potential conflicts involving resource users can be resolved. This includes working with community members to define criteria for eligibility for compensating measures and identifying the relevant administrative jurisdictions and line ministries (including clear delineation for administrative and financial responsibilities under the project) responsible for implementing mitigating or compensating measures.
- (4) Develop strategies for participatory monitoring of beneficial and adverse impacts within the management area and the effectiveness of compensating measures.

The management plans will include a detailed write up of the results of these consultations. This will include descriptions of (i) proposed restrictions on subsistence natural resource use, (ii) criteria for eligibility of affected persons, (iii) measures to assist affected persons to improve or restore their livelihoods while maintaining sustainability of the park, (iv) administrative procedures for how potential conflicts will be resolved; (v) legal procedures for project management; and (vi) monitoring arrangements.

Plan of Action. The protected area management plans would serve as the Plan of Action required by the Bank's policy on involuntary resettlement to be developed and submitted to the Bank during project implementation and prior to enforcement of existing or new laws and regulations governing access to resources in the protected areas, describing the specific measures to assist persons to be adversely affected by the proposed restrictions.

## **Additional Annex 14: Environmental Assessment and Mitigation Plan ARMENIA: Natural Resources Management and Poverty Reduction Project**

The project includes three main components which were addressed in the environmental assessment:

- Community Based Natural Resources Management;
- State Forest Management; and
- Protected Areas Management and Biodiversity.

### **Project Impacts**

The project aims to achieve a range of positive environmental and social impacts, and the components of the project have been so designed to enhance the positive outcomes and to also include mitigation measures for possible adverse or negative impacts.

The project will support the ecosystems approach and pays attention to landscape protection, with a view to the reduction of the impact of forestry on natural ecosystems and landscapes. The major, expected positive and potential negative impacts identified in the EA are summarized in the boxes below. The primary impacts identified in the EA are not individually significant but have the potential to be cumulatively significant

The project will increase productivity of existing livestock numbers. Training and extension through demonstration activities becomes a vital component to mitigate this risk along with work with communities to develop grazing management plans that balance livestock numbers with available forage. Sustainable grazing management activities supported by the project rests on three pillars – management of intensively used community pastures, increased productivity of hay meadows, and reintroduction of fodder crops in cropping rotations. All three pillars emphasize the use of endemic leguminous forage species that are a globally significant agro-ecological resource – including the center of origin of significant species such as alfalfa (*Medicago sativa*). Exotic species and provenances will not be introduced by the project. Local provenances and species mixes will be preserved by using fertilization and grazing management interventions that maintain existing species compositions. The project will not convert native pastures into a cultivated forage base.

Measures for protection forests are designed with a view to the human impact, which varies from strict protection to low-impact forest operations (IUCN, 1994). Production forests, while predominantly managed for economic production of wood and non-wood forest products and services, are also subjects to ecological considerations and constraints. The project focus is on long-term benefits and sustainability.

Rehabilitation of degraded forest roads have environmental benefits, since better designed roads reduce erosion, but they may have potentially negative impacts and also side effects. When and where appropriate for specific works a targeted rapid EA will be carried out. Potential impacts shall be reduced through low impact technology with best environmental practice, management and supervision of works. BPM and Guidelines will include recommendations designs and supervision which among others will include: assessment of risk for erosion and other negative effects; provisions for supervision and monitoring of key biotopes and species; measures for provision of corridors for wildlife; assessment of the significance of impacts on biodiversity for all measures undertaken in the protected areas and buffer zones. Preservation of the natural level and function of water courses and river beds should be ensured and proper drainage facilities installed and maintained.

## Methodology

The methodology follows the World Bank's policies on environmental assessment (OP 4.01 and related policies and guidance documents) and has been prepared through extensive field consultations with implementing agencies and project beneficiaries and general public. The EA process involved a secondary assessment of possible impacts, both positive and negative, as well as an assessment of the proposed enhancement and mitigation measures. When possible, further enhancement measures were identified.

## Public consultations

EA consultation process has been carried out at two levels:

- At the national level: interested government bodies, NGOs, and other interested members of civil society were consulted during the EA preparation process. Additionally, the draft EA and non-technical summary was disclosed such that the above stakeholders could obtain the document and submit comments.
- At the local level: government authorities, water users associations, the affected villages as well as potentially affected nearby villagers, and other interested stakeholders were consulted in some depth during the EA preparation phase. Public hearings were held in local project communities in the second phase of consultation when the draft EA report was disclosed and discussed.

Public consultation took place in two phases. Firstly, consultation during the EA preparation process helped to identify key environmental issues and provide information on stakeholders' concerns about and views of potential environmental impacts. Secondly, consultation at the draft EA stage allowed stakeholders to review findings and comment on proposed mitigation and management options.

## Environmental Assessment Findings

The risks identified are mainly process management or institutional in nature, but unless addressed within the project design / implementation framework in a timely manner have the potential to compromise the relevancy and efficacy of the proposed mitigation and enhancement measures. These project or management risks are identified separately for the three project component. The table below provides a summary of the project impacts:

### A. Intended Positive Impacts

<b>Community Based Watershed Management</b>
<b>1. Community forest management</b>
Increased understanding of forest conservation needs. Biodiversity conservation of forest buffer zones, pastures and arable land.
· Establish multi purpose indigenous species in forest buffer zone.
· Reduction of pressure on pasture land.
· Provide sustainable wood and non-wood products, and alternative energy sources to wood leading to conservation of forest habitats.
· Provide short and long-term income generating opportunities. Promote sustainable management practices and raise environmental awareness
<b>2 Community pasture management</b>
· Increased food security
· Long-term income generation.

<ul style="list-style-type: none"> <li>· Provide short and long-term income generating opportunities.</li> <li>· Stop further degradation of soil resources (forest, arable and grazing lands) leading to increased soil fertility and a reduction in watershed sediment yield/erosion.</li> <li>· Promote sustainable management practices and raise environmental awareness.</li> </ul>
<b>3. Sustainable agricultural practices</b>
<ul style="list-style-type: none"> <li>· Increased food security</li> <li>· Increased opportunities for cash or barter income.</li> <li>· Improved productivity will reduce pressure on marginal areas.</li> <li>· Halt decline in soil fertility</li> </ul>
<b>4. Community infrastructure and income generation</b>
<ul style="list-style-type: none"> <li>· Increase cash surplus available for re-investment in sustainable agriculture practices</li> <li>· Increased productivity will reduce pressure on marginal areas</li> <li>· Increase food security</li> <li>· Help to realize non-timber forest values</li> <li>· Reduction in erosion caused by poor management of water resources</li> <li>· Pasture improvement leading to reduced erosion, increased fertility, increased carrying capacity, biodiversity preservation.</li> </ul>
<b>5. Development of community institutions</b>
Establishment of resource user groups and village watershed management board
Strengthening the capacity of exiting community and marza level organizations
Community awareness
<b>State Forest Management</b>
<b>1. Sustainable forest management practiced in selected pilot areas on state forest land</b>
<p>Avoid cumulative environmental impacts of forest production and rehabilitation activities (e.g. soil erosion, sedimentation of watercourses, biodiversity loss).</p> <p>Enhance biodiversity conservation and sustainable ecosystem management in forest and grazing lands.</p> <p>Employment opportunities in road construction, workforce programs, rehabilitation activities etc.</p> <p>Alleviate the rapid degradation of forest resources.</p> <p>Reduction in environmental impacts of existing road construction practices.</p> <p>Carbon sequestration.</p> <p>Increase contribution of forests to the state budget.</p> <p>Reduction in illegal activities related to forests.</p> <p>Recreational and amenity value of land increased.</p>
<b>2. Legal, institutional, policy and human capacities for sustainable forest management, biodiversity conservation and poverty reduction established in Hyantar, FREC, Ministry of Nature Protection and village councils</b>
<p>Legal and institutional framework for sustainable forest management established.</p> <p>Institutional capacity strengthened in key institutions.</p> <p>Establishment of effective monitoring systems for forest management and planning.</p> <p>Legislation reformed to enable community and private sector ownership and management of forest resources.</p> <p>Alleviation of corruptive practices.</p> <p>Forest products markets and prices reformed.</p> <p>Forest extension services for non-state forest owners and community members created.</p>
<b>Protected Areas Management and Biodiversity Conservation</b>
<b>1. Strengthen institutional capacity at the national level</b>
<ul style="list-style-type: none"> <li>· Improved legal and regulatory framework for protected area management.</li> <li>· Strategic planning and integration of biodiversity into sectoral policies.</li> </ul>

<ul style="list-style-type: none"> <li>· Strengthened stakeholders' institutional capacity.</li> <li>· Sustainable management practices developed.</li> <li>· Monitoring unit established and monitoring improved.</li> <li>· Better communication equipment and transport provided.</li> <li>· Environmental education implemented and environmental awareness raised.</li> <li>· Transboundary co-operation on protected areas with Georgia improved.</li> </ul>
<b>2. Strengthen the management of Dilijan State Reserve and Lake Sevan National Park</b>
<ul style="list-style-type: none"> <li>· Protected areas at Lake Sevan National Park and Dilijan Nature Reserve with management plans and new zoning under implementation.</li> <li>· Enhanced management of protected areas through public-private partnerships.</li> <li>· Equitable sharing of financial benefits with local communities.</li> <li>· Revenues for sustainable management and conservation programs generated.</li> <li>· Stabilization of key threatened ecosystems and critical habitats in the project area.</li> <li>· In-situ conservation of biological resources improved.</li> <li>· Monitoring of key endangered species as indicators for ecosystem regeneration.</li> <li>· Illegal hunting and logging decreased.</li> <li>· Public awareness raised and community involved in biodiversity conservation.</li> <li>· Increased protection of cultural and biodiversity values.</li> <li>· Short- and long-term income generation provided.</li> </ul>
<b>3. Establish basic infrastructure for park management</b>
<ul style="list-style-type: none"> <li>· Short and long-term income generating opportunities provided.</li> <li>· Facilities for visitors, education and management improved.</li> <li>· In-situ conservation of biological resources improved.</li> <li>· Strictly protected areas better protected to reduced access.</li> <li>· Roads and trails improved.</li> <li>· Cultural heritage sites upgraded.</li> </ul>
<b>4. Community grant program (small grants program for community based activities in the protected areas and their buffer zones)</b>
<ul style="list-style-type: none"> <li>· Short and long-term income generating opportunities provided.</li> <li>· Equitable sharing of financial benefits with local communities.</li> <li>· Increase awareness of biodiversity values and involvement of communities in biodiversity conservation.</li> <li>· Further degradation of resources (forest, arable and grazing lands) mitigated.</li> </ul>

## **B. Primary Potential Negative Impacts**

<b>Community Based Watershed Management</b>
· Environmental impacts of construction (field track rehabilitation and gully control)
· Increased grazing pressures on pasture from livestock herd increases due to access to credit or other sources of funds
· Environmental impacts related to overuse of chemical fertilizers
· Environmental impacts of increased irrigation
· Increased pressure on and pollution of water resources
<b>State Forest Management</b>
· Environmental impacts of road construction, rehabilitation and maintenance
· Environmental impacts of felling activities (thinning, sanitary cuttings, etc)
· Environmental activities of illegal forest activities
<b>Protected Areas Management and Biodiversity Conservation</b>
· Environmental impacts of facility construction – likely minor and manageable through improved institutional and staff capacity, monitoring and other component elements
· Impacts of increased visitation and usage on protected area resources – long term possibility and manageable through implementation of new protected area management plans

and improved institutional and staff capacity and monitoring
· Environmental impacts of road and trail rehabilitation and construction – likely minor and manageable through improved institutional and staff capacity and monitoring
· Environmental impacts associated with increased economic activities - long term possibility and manageable through implementation of new protected area management plans and improved institutional and staff capacity and monitoring

*Forest Management.* The component is designed to address the rapid degradation of forests. The EA has highlighted two primary potential key negative impacts of the FMC which derive from:

- (a) increased access to the forest (new and improved access); and
- (b) rehabilitation and maintenance of forest roads.

While the FMC incorporates mitigation measures for both of these potential impacts, it is suggested that certain mitigation measures be further enhanced. The two most important mitigation measures proposed in the EMP are:

- development of a Best Practice Manual for Forest Road Rehabilitation and Maintenance, and
- provision for independent review (with possible certification, using internationally defined criteria and indicators) by national or international certifying bodies, such as the Forest Stewardship Council.

The EMP discuss in detail these and other recommended mitigation measures. EMP provides for specific mitigation measures for individual forest operations and best practice principles for Manual for Forest Road Rehabilitation and Maintenance Works.

*Protected Areas and Biodiversity Component.* The activities in this component are all intended to create positive environmental and social impacts. However, some minor potential negative environmental and social impacts which the project design aims to address were identified. These concern mainly minor potential impacts from increased usage of resources and related economic activities, including eco-tourism, and the construction and rehabilitation of buildings, roads and trails. The cumulative effects of these activities can be expected to be very low.

Furthermore, often project activities themselves provide for mitigating measures for these potential impacts. In some cases these activities provide opportunities to be enhanced by management plans included in the component or by referring to management plans developed for the other components (e.g., minor works, road and trail rehabilitation).

### **Environmental screening and monitoring**

- (a) Siting and construction: inventories of flora and fauna would be included in the infrastructure plan to be developed in the first year of the project; the PIU and local authorities will supervise preparation of site specific environmental plans before issuing permits for construction/ rehabilitation activities, in accordance with the national *Regulation on Environmental Expertise* and standard Bank environmental safeguard procedures.

Public consultations on annual community plans will take place and will be facilitated by the project implementation consultant within the PIU. Environmental screening for small-scale village infrastructure and road rehabilitation works will be carried out according to the national law and specifically *the Regulation on Environmental Expertise* and standard Bank environmental safeguard procedures.

(b) Increased visitor use in recreation and park areas: visitor numbers would increase at modest rates during the first 3 years of the project as the management plans are developed and project investments gradually build service capacity on interpretation services and visitor management; the project would provide technical assistance in visitor management and impact monitoring.

Monitoring of impact mitigation measures will be integrated in the MC, FM and PA management plans. The agreements based on the MC and FM plans with participating communities and implementing agencies will include agreement on indicators, frequency and reporting milestones for monitoring during implementation. Both environmental and social indicator monitoring will be carried out during the project lifecycle. In addition, mid-term and final reviews will be carried out. Five categories of indicators have been selected: social, environmental, sustainability, input and output. A draft list of indicators has been drawn up in the preparation reports, however, the exact timetable and assignation of the responsibility for this monitoring will be included in the landscape planning process and monitoring plans to it.



**Additional Annex 15: Environment**  
**ARMENIA: Natural Resources Management and Poverty Reduction Project**

