PROJECT BRIEF

1. IDENTIFIERS

PROJECT NAME:	**Armenia: Natural Resources Management And Poverty Reduction Project**
PROJECT NUMBER:	P069917
DURATION:	6 years
IMPLEMENTING AGENCY:	World Bank
EXECUTING AGENCY:	Ministry of Nature Protection
REQUESTING COUNTRY OR COUNTRIES:	Republic of Armenia
ELIGIBILITY:	Armenia ratified the Convention on Biological Diversity (CBD) in May 1993
GEF FOCAL AREA:	Biodiversity Conservation
GEF PROGRAMMING FRAMEWORK:	Operational Programs 3, 4 and 12: Forest Ecosystems, Mountain Ecosystems, and Integrated Ecosystems Management

2. SUMMARY

The GEF will finance the incremental costs of programs and investments needed to protect and enhance the unique mountain, forest, lake and grassland ecosystems in Armenia, including their habitats which host regionally and globally important biodiversity and endemism in Southern Caucasus and strengthen in-situ management of priority protected areas. The project proposes to implement the management of Dilijan State Reserve (290 sq. km) and Lake Sevan National Park (1,500 sq. km) defined as priorities in Biodiversity Strategy and Action Plan (1998) and National Environmental Action Plan (1999). The Dilijan State Reserve protects critical mountain, forest, meadow and steppe ecosystems which hosts 900 species, some of them endangered species in the southern Caucasus. Lake Sevan National Park protects unique alpine lake ecosystem and its littoral habitats, and high elevation alpine meadows with rich native plant species richness. In addition, the project would conserve the mountain broad leave forest and natural grassland ecosystems outside the protected areas through reforestation, re-vegetation and improved management activities, which would conserve transboundary wildlife movement corridor in the mountain forests between Armenia and Georgia, as well as between protected areas in the project area. It would also support environmentally sustainable farming practices in the production landscape. The GEF activities are part of a larger project to support poverty reduction and sustainable natural resource management in the upper watersheds of Northern Armenia.

3. COSTS AND FINANCING (MILLION US$)		
GEF:	Project	$ 5.00
	PDF-B	$ 0.21
Sub-total		***$ 5.21***
Co-Financing		
IDA Credit		$ 9.50
Government		$ 1.50
Total Project Cost (including PDF B)		***$ 16.21***

4. ASSOCIATED FINANCING (MILLION US$)

5. OPERATIONAL FOCAL POINT ENDORSEMENT

NAME: Vardan Ayvazyan
TITLE: Minister
ORGANIZATION: Ministry of Nature Protection
DATE: September 14, 2001

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A: Project Development Objective

1. *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 the majority of these live in poverty. Only 28 percent of land area located below 1,500 m elevation.

Pressures on the environment and on natural resources in particular have grown since independence. Pressures on agricultural lands and forests are likely to grow with the gradual degradation of rural infrastructure (i.e. irrigation systems, energy supply, rural roads), decreasing living standards of rural population, and limited capacity of individual farmers to buy farm inputs. Despite the positive impact of the Bank's assistance to agricultural sector about 15% of the privately owned land remains idle. More than 60% of the land remains in need of improved soil management in order to reduce erosion and sustain productivity. In 1999 the arable land use decreased by 134,000 ha which amounted to 27% of the total. The limited dimension of the consumer market forced the land owners to switch to marketable agricultural crops(wheat and potato) and thus reduce significantly orchards and vineyards. Crop rotation is rarely applied which in turn results to decrease soil fertility and generates escalation of weathering processes. Only 5% of the pastures are partially improved, and the rest continues to degrade due to different level of overgrazing.

Despite current economic hardships, the Government of Armenia (GOA) remains committed to sustainable use of natural resources and in the improvement of 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. Long-term development goals of the country are poverty alleviation, conservation of its natural and biodiversity resource base, and sustainability of natural resource use.

Armenia is located in the Caucasus eco-region, one of the Global 200 Eco-regions, located at the crossroads of three biogeography provinces (European, Central Asian, and Middle Eastern) and which includes unusually rich flora, fauna, and natural landscapes and ecosystems.

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 329 are considered to be rare or declining which means that the rate of endemic fauna is 2%. 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 mlokosiwiczi*). A large portion of plant and animal species are endemic and relic species with narrow and fragmented natural habitats as well as wild counterparts of cultivated plants and used as a potential source of genetic resource. There are a great number of endemic species and red book species among tree and bushes. Some relic species are of global significance, e.g. *Taxus baccata*, *Platanus orientalis*, *Corylus colurna.* Among wood plants *Pyrus*, *Crataegus*, *Rosa* and *Sorbus* are endemic species. Wild fruit species such as *Malus*, *Mespilus*, *Punica*, are especially important for the conservation and sustainable use of agro-biodiversity. Furthermore, a great variety of landscape zoning and climatic conditions in Armenia resulted in generation of cultivated plant forms and sorts in diversity centers independent from each other. These species are notable for their productivity record and

resilience to unfavorable conditions, diseases and pests, and constitute the significant basis for conservation of agro-biodiversity.

The project area includes a variety of mountain, forest, meadow 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 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). Lake Sevan National Park[1] harbors unique alpine lake ecosystem and its littoral habitats. Dilijan National Reserve[2] is a unique forest ecosystem which hosts 900 species, some of them endangered species in the 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 forms unique ecosystems which has significant potential for developing eco- and natural heritage tourism.

Project interventions will deploy in Gegharkunik and Tavoush marzes where environmental degradation is characterized by an array of typical environmental problems. The Social Assistance Study, World bank 1999, found that extreme poverty is concentrated in border areas, high altitude rural areas and earthquake zones. It is more acute in upland areas such as the project sites, where the quality and quantity of land is inadequate, lands are remote from homesteads and access to irrigation is limited.

Additional information on the significance of biodiversity in the project region, and on the project sites and threats is found in Annexes 4 and 5.

2. Project development objective and features, and key performance indicators :

The broad project development objective is to alleviate rural 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 project objective will be achieved by:

(i) promoting sustainable farming, range, livestock and farm forestry practices among local communities, including increased use of landraces of indigenous crops;
(ii) supporting income generating farm activities, including water harvesting, bee-keeping and improved animal husbandry and rural tourism;
(iii) supporting improved forest management, including strengthening of national and local capacity for forest management planning and reforestation of denuded and degraded areas using indigenous species;
(iv) integrating rural development activities such as grazing management of pasture and forests, sustainable livestock production, marketing support and eco-tourism
(v) conserving biodiversity through protection, regeneration and sustainable use of forest resources and improved management of protected areas;

[1] According to the current Armenian legislation a National Park is a protected area, comprising a core protection zone and incorporating a combination of zones with state reserve status (strict conservation "zapovednik"), state reservations (conservation and sustainable use), as well as recreational and development zones.
[2] Armenian State Reserves broadly correspond to the IUCN "category Ia" (IUCN 1994) protected area. According to the national law "*State Reserves are established to ensure the highest degree of protection to important habitats and species. Human activity within state reserves are limited to scientific research*".

(vi) building the capacity of local institutions and communities by supporting participatory approaches to these activities.

The project will contribute towards reversing the present trends of natural and biological resource degradation in pilot micro-watershed areas in Tavoush and Geghakunik Marzes. It will provide project stakeholders with opportunities to address resources management issues in a more comprehensive and integrated way.

The project fully supports the Government's broad strategy for poverty reduction and provides a comprehensive response to biodiversity and ecosystem conservation priorities through measures for sustainable use of biological and natural resources. It will provide an opportunity to test innovative participatory natural resources management approaches in selected micro-catchment areas in Geghakunik and Tavoush marzes. If deemed successful, these approaches could be adopted elsewhere in the country. By involving the stakeholders in planning and implementation of activities the design will ensure that objectives and strategies respond to priorities and interests of ultimate beneficiaries in the selected watersheds. The project will test land based conservation approaches from projects in the region (e.g. Turkey- Eastern Anatolia Watershed Rehabilitation Project) and adapted to multiple project goals and realities of local farmers. Watersheds as primary project sites are not regarded simply as a geographical area that feeds water and to drainage line, but the area from which communities living within it make a living, more or less dependent on the local resources. The project aims to demonstrate that integrated management of watersheds is important for livelihood reasons, as well as for environmental protection

The project design builds on the experience in Armenia in developing community based social assistance and rural development programs in particular the SIF I and SIF II Projects, Irrigation Rehabilitation, Agriculture Reform Support and Title Registration Projects, as well as incorporation of lessons learned in poverty alleviation and community based natural resources management throughout projects in ECA and other regions. Furthermore, the project will coordinate its activities with on-going World Bank projects in Armenia, and activities carried out by other donors. The UNDP Agro-biodiversity Conservation Project takes a broader approach to address cross cutting issues such as mitigation of rural poverty, lack of inter-sectoral cooperation and public awareness. Finally, the project is complementary to the proposed GEF/UNDP medium sized national project for In-situ Conservation and Sustainable Use of Agro-biodiversity now under preparation. This project is designed as a demonstration project to provide technical support for developing a mix of *in-situ* conservation activities of agro-biodiversity and land race and to develop a legislative and management framework for conservation and management. Cross-fertilization between the proposed project and the UNDP demonstration project will be sought during preparation and implementation to reinforce the project design. This project will also build on the work carried out by other donors active in Armenia such as UNEP, UN-FAO, USAID, and SIDA in the area of environmental protection and natural resources use.

Monitoring development outcomes

Performance indicators measuring progress towards achieving the project development objective will be agreed in detail during appraisal and will *inter alia* include: (i) increased participation in natural resources management decisions, as perceived by stakeholders in target communities; (ii) crop and livestock productivity in project area increases relative to marza and national productivity trend; (iii) forest and range land vegetative cover/habitat increases; (iv) increased household incomes in participating communities; (v) protected areas at Lake Sevan National Park

and Dilijan Nature Reserve (1780 sq. km) with management plans under implementation; and (vi) stable or increasing numbers of up to three target plant/animal species (to be determined during appraisal).

Overall social impact of the project will be monitored and evaluated through a simple system of annually administered rapid household surveys. The survey instrument has already been developed during project preparation and a baseline survey of 300 household survey has been completed. Follow-up household surveys will be conducted in both project and non-project villages so that the change in the indicators can be attributed to project interventions. Frequency of surveys will be agreed upon during project appraisal. The specific poverty monitoring indicators will include levels of income and expenditures, as well as categories of income and expenditures. They will also include measurement of household participation in work fare programs and different user groups created under the project. The social indicators will include questions about knowledge and understanding of sustainable agricultural practices. Data collection and analysis will be undertaken by a social specialist or agricultural economist engaged by the PIU. The specialist will be responsible for producing a report once a year that summarizes the impact of the project on the population using the suggested indicators and providing recommendations on how implementation can be improved. In addition to the above, the formation (and participation) watershed management councils will be monitored.

3. Project Global objectives and key performance indicators

The global environmental objective of the proposed project is to protect and enhance the unique mountain, forest, and grassland ecosystems in Armenia, including their habitats which host regionally and globally important biodiversity end endemism in Southern Caucasus, with a focus on strengthening of in-situ management of priority protected areas. The project proposes to implement management of Dilijan State Preserve (280 sq. km) and Lake Sevan National Park (1,500 sq. km) defined as priorities in Biodiversity Strategy and Action Plan (1998) and National Environmental Action Plan (1999), to improve the management of . The Dilijan State Preserve protect critical mountain, forest, meadow and steppe ecosystems which hosts 900 species, some of them endangered species in the southern Caucasus. Lake Sevan National Park protects unique alpine lake ecosystem and its littoral habitats, and high elevation alpine meadows with rich native plant species richness. In addition, the project would conserve the mountain broad leave forest and natural grassland ecosystems outside the protected areas through reforestation, re-vegetation and improved management activities, which would form a critical transboundary wildlife corridors between Armenia and Georgia, as well as between protected areas in the project area.

Global environmental objectives will be monitored according to the *Guidelines for Monitoring and Evaluation of GEF Projects*. Some monitorable indicators of project success would include: (i) implementation of landscape-level watershed plans linking protected areas and critical ecosystems; (ii) conversion of at least two paper parks to effectively managed protected areas; and (iii) stabilization of key threatened ecosystems and critical habitats in the project area.

B: Strategic Context

1(a). Sector-related Country Assistance Strategy (CAS) goal supported by the project

CAS document number: 16899-AM Date of latest CAS discussion: 07/31/97

The project would implement the CAS (No. 16899-AM from July 31, 1997) objective of supporting social sustainability and poverty alleviation and mitigate environmental degradation, one of the key medium-term risk to sustainability of economic growth identified in the CAS. A new CAS consistent with Government's Poverty Reduction Strategy Paper (PRSP) is currently

being discussed with the Government of Armenia. The Interim PRSP (I-PRSP) from March , 2001, places an emphasis on protection of environment and regeneration of natural resources as a basis for sustaining local economies and reduction of rural poverty. The I-PRSP objectives build on a set of mid- term benchmarks for increased productivity of resources and income growth based on improved resource management strategies. Among priority policy measures identified in the I-PRSP priority is accorded to conservation of biodiversity and critical habitats through integrated ecosystem management with involvement of local communities.

b. GEF Operational program objective addressed by the project:

The project is consistent with the objectives related to the GEF Biodiversity focal area. Specifically, it is consistent with the GEF Operational Program # 3 Forest Ecosystems and Operational Program #4 Mountain Ecosystems. The individual protected area sites, identified as national priorities in the Biodiversity Strategy and Action Plan (1998) and National Environmental Action Plan (1999), are regionally significant in protecting the biodiversity corridors in Southern Caucasus area. The project supports conservation and sustainable use of biodiversity outside of the protected areas by improving mountain forest and grassland management through involvement of local communities who depend upon them for their livelihoods. Proposed re-vegetation measures have potential to contribute to the global effort to mitigate anthropogenic releases of carbon dioxide. It responds to COP III guidance by promoting capacity building, especially for local communities; promoting conservation and sustainable use through adaptive management of forest landscapes, and meets the objectives of other international conventions. As such, the project is also consistent with the GEF Operational Program # 12 on Integrated Ecosystems Management

Armenia ratified the Convention on Biological Diversity (CBD) in May 1993. Recognizing the importance to contribute 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 undertaken a commitment 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 level natural ecosystems and spheres of activity which are most vulnerable to negative effects and ecological consequences that need to be addressed through practical actions. The First National Report on CBD and BSAP has been approved by the National Steering Committee in April 2000. Following the BSAP approval the Government launched a second generation projects for Capacity Building Assessment and establishing a Clearing House Mechanism to develop a database on biodiversity. 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:

Background. Since the collapse and dissolution of the Former Soviet Union, Armenia has suffered a number of serious setbacks which have led to the impoverishment of many rural communities, especially the remote mountain and border areas. Not least of these setbacks has been the collapse of industries which provided employment together with the collapse of market infrastructure and rural infrastructure. Thrust into such a situation, rural populations had little choice but to resort to exploiting their natural resource base for their survival and subsistence as, generally, it is available at little or no cost. This is manifested in extensive low-input/low-output crop and animal production leading to inappropriate cultivation practices, and overgrazing of

pastures, especially those closer to the village or homestead. Use of hardwood trees for fuel, due either to the cost or unavailability of alternatives, is also exerting pressure on forests resulting in reduced ground cover and water absorption. Generally speaking, the poorer the population, the more dependent they are on the natural resources, a situation which demonstrates a direct link between poverty and environmental degradation.

Land use regulations are still underdeveloped and the capacity to enforce them is extremely limited. Thus, rural communities have almost unlimited access to natural resources, i.e. private use of common resources, which has led in very many instances to severe degradation of forests, pastures and soil erosion with the consequent loss of habitat for indigenous flora and fauna. It can, therefore, be seen that this process is an accelerating downward spiral of increasing poverty resulting in increasing pressure on resource leading to degradation and resulting in increased poverty etc. If this continues to be ignored, the time will come when the natural resource is unable to sustain any form of life, including humans.

In order to arrest this state of affairs, it would appear imperative that the problems of poverty are addressed which in turn will lead to a steady reduction in pressure on the natural resources until the situation is reached where exploitation and regeneration are in balance. In this context, the aims and objectives of this project, alleviating poverty through the improved and sustainable use of natural resources, provides the necessary linkage to reverse the present trend.

The following are specific sector issues which the project aims to address:

- *Steady deterioration of arable land and pastures.* Productivity of arable land has declined significantly during the recent years due to soil degradation. An estimated 60% of the country's agricultural lands are affected by soil erosion caused by deforestation, inappropriate agricultural practices. The main causes for the severe deterioration of land are: (i) limited use of equipment; (ii) Inability of land users to practices efficient and sustainable farming and livestock breeding due to fragmentation of land plots which prevents farmers to carry out adequate sowing circulation ; (iii) large areas of arable land are subject to deterioration due to ploughing done along slope inclination. The result is an estimated annual decline of 0.5% in crop production and 1% in livestock production. In the Lake Sevan watershed (i.e. one of the proposed project sites), some 25% of farmlands on the southern slopes of Sevan's mountain chain have been abandoned, and the productivity of the remaining farmland is declining as a result of ongoing soil erosion. The decrease of fertility of land in Armenia is becoming more obvious when fertility indicators are compared.

  The disintegration of livestock export markets in the Soviet led to a fundamental shift in grazing patterns. Overall, the inventory has declined from 0.9 cattle and 2.5 million sheep to 0.5 and 0.7 million respectively. Pastures located around villages are often under pressure from overgrazing while more remote summer pastures in Alpine meadows remain underused. The forage obtaining technology is poor. Overgrazing of animals leads to generation of erosion centers due to freeing off micro-terraces and livestock paths of vegetation cover. Generation of gorges as a result of cover with mudflow sediments is common. Erosion centers are also formed by automobile and carriage wheels on steep rural and pasture roads on mountain slopes. Farmers fail to take any measure against road erosion. This phenomena is particularly widely spread in Gegharkunik and Tavoush.

- *Degradation of forests* . Unsustainable levels of forest harvesting and overgrazing have resulted in a 10% decline in forest cover in the last 10 years. This has compounded the long term trend in deforestation, which has resulted in a decline in total forest cover from

25% to 10% over the last several hundred years. An important contributing factor to the most recent deforestation was the reliance on fuel wood as a principal source of heating and cooking during the last energy crisis. As a result of logging for timber and fuel wood there is increased soil erosion, especially in the mountain areas. Illegal logging remains a major issue in the forest sector.

Sustainable management of forests is constrained by a poorly equipped and trained Forest Administration (Hayantar) which is characterized by a very weak communication system, old and only partly functioning machinery and vehicle park. Furthermore, the legal and policy framework for forest management is incomplete, and by-laws to operationalize the forest management functions of Hyanatar are still missing. Among the secondary consequences of the depletion of forests in the Lake Sevan watershed is increased siltation and eutrophication of the lake and surrounding rivers.

- *Protected areas management.* The protected area network in Armenia is fragmented and the effectiveness of their management is low. Planning for conservation programs in protected areas is inadequate and neither parks or reserves are required to develop and implement management plans. Scientific studies within protected areas are not well integrated into park management decisions. Infrastructure maintenance is poor due to insufficient funding. Although in many cases staff has diverse skills most of them are not trained in protected areas management. Staff wages and salaries are often lower than the subsistence level and frequently unpaid for months in a row due to the significant budget arrears across public sectors.

- *Loss of globally and regionally significant biodiversity*. The degradation of globally significant biodiversity has also been caused by increasing pressures on critical rangelands and forest habitats, which have further isolated the existing protected areas, making the movement of wildlife increasingly difficult. Alpine meadows in Armenia often have biodiversity of global significance. Their plant composition and maintenance needs constant human intervention and interaction with traditional agriculture activities , such as grazing and mowing. Due to difficult access many of these meadows are no longer used and may loose their global ecological value. Rich forest biodiversity is subject to heavy pressures through deforestation and overgrazing. Illegal felling threatens forest flora and fauna as it often leads to complete removal of dominant trees and species and loss of animal habitats in the forest ecosystem. Armed conflicts in the north led to biodiversity loss: forested ecosystems have suffered and part of the fauna has fled. Forest in “conflict areas” along the border are abandoned with a view to management and operations. Silvicultural management is of poor quality and contributes to forest degradation and loss of biodiversity. Finally, the population is largely unaware of the protected areas system and communities in the vicinity frequently feel alienated by the system.

- *Institutional capacity.* The management of natural resources is the formal responsibility of the Ministry of Nature Protection (MONP). However, human capacity and financial constraints limit the MONP's ability to fulfill this role, especially at the local level. Cooperation among relevant sectoral agencies is weak, with several agencies sharing overlapping responsibilities of resource use. Generally the public awareness of natural resources issues is weak. Widespread mistrust of government agencies, combined with often conflicting regulations and unclear property rights have further weakened the ability of local communities to manage their resource base on a sustainable basis. Budget

limitations and general lack of financing is a continuous constraint to build adequate technical and management capacity.

- *Rural Poverty*: Some 55% of the Armenian population is classified as poor. Rural poverty is particularly evident among those living in high altitude areas such as Tavoush and Gagharkunik. The rural economy has provided a "safety net" during the crisis years, by absorbing the excess labor (employment in agriculture almost doubled between 1991 and 1996). Rural communities have been able to buffer themselves through their access to natural resources.

- *Linkages between resource degradation and rural poverty*. 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. The most important source of income (including self-consumption, cash, barter and processing) is crop agriculture and only 10 percent of population engage in cash sales of their agricultural production. Remittances, pensions and day labor (other income) provide primary source of cash to buy goods and services. The majority of farmers are cash constrained and are unable to invests in their land and pasture. This contributes to a slow downward spiral into poverty once productive natural assets are over-exploited.

Government Strategy:

Agriculture and Land Reform. Agriculture remains a dominant sector of the economy providing employment to about half of the households and contributing to about 22% of the GDP (currently). The Government has taken actions to liberalize the country's agriculture and to arrest the deterioration of agricultural infrastructure. Through recent changes the sector is gradually moving towards achieving a number of major reform steps: a) development of a working rural financial system to support privatized agriculture, fanners, and processors; b) restructuring of privatized agro-processing enterprises and rekindling of demand for processed agricultural products; c) implementation of a registration system for transactions in land and other real estate which is capable of standardizing determination of collateral for working capital and investment loans; and, d) strengthening of agricultural support services which can both transfer information on agricultural practices and farm management, and deliver commercially usable agricultural research results.

The continuation of land reform efforts will be an important element of the government's strategy for natural resources management. Land is the only major natural resource which has been substantially transferred to private ownership over the last few years. 80% of agricultural lands have been privatized, maintaining 20% under community control. The short-term leasing of communal pastures to local communities and households has inadvertently encouraged overgrazing, leading to declined grassland productivity and increased soil erosion. The Government strategy is how to address existing disincentives for sustainable, community based resource management. Within this enabling environment, and under the project the individuals and communities will be empowered to make rational decisions on measures that are environmentally sound and economically justified.

In addition, with FAO support the Government has initiated the development of the Sustainable Rural Development Strategy. The strategy work is still in progress and scheduled to be presented to the Cabinet for discussion in December 2001. The Specific objectives of the strategy are to: (i) provide food security in the country; (ii) improve social conditions in the country, reduce poverty; (iii) establish an agricultural system smoothly functioning under market economy conditions and

principles; (iv) support the development of production and marketing of Armenian agricultural production, which will ensure the entrance into the international market and competitiveness; and (v) increase profits and improve livelihood of rural population. The strategy will focus on the following: (i) agricultural policy and macroeconomics; (ii) crop production; (iii) livestock breeding; (iv) processing and marketing of agricultural products; (iv) financing of agriculture; (v) rural infrastructure and management. Draft sub-sector reports under discussion include among priority development issues strengthening of resource management institutions, improved natural resource utilization, support for adoption of less environmentally damaging farming methods.

Forestry Sector Strategy. The Government intends to declare the 21st century as the century of Armenia's afforestation with the objective to increase forest coverage considerably. A sector reform process has been initiated, which aims to define better the functions of different state bodies and to resolve overlapping of institutional responsibilities.

Recent changes in the Land Code provide a platform for necessary changes in the Forest Code regarding the duration of forest utilization rights. A current proposal to re-institute community forests will facilitate local participation in forest activities in rural areas. Institutional reform plans include establishment of training and information facilities to increase the profession forest knowledge and raise public awareness of forestry issues. As part of the measures to curb corruption in the sector, the Government plans to transfer responsibilities for wood sales from state forest to the State Procurement Agency. Recently, the Government has made attempts to increase flow of revenues from utilization of state forests, to improve collection of taxes and social fees among citizens and enterprises and to better control "black market" activities.

Long Term Strategy for Biodiversity Conservation. Armenia's strategy for biodiversity conservation, as identified in the NEAP and First National Report on BDC 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 know-how in sustainable development and its enabling legal framework; (ii) public awareness and participation; (iii) protected area network planning and management; and (iv) safeguard flora and fauna by mainstreaming biodiversity conservation into agriculture, forestry and other economic sectors. This strategy will require external financial assistance to gradually build human capital and develop practical models for Armenia's difficult economic and environmental situation. With its Decree No.167, of March 9, 2001, the Government has approved the development of a National Natural Resource Management Concept among key activities supporting the implementation of the Government development programs.

Poverty Strategy. In 1999 Armenia allocated a substantial portion of its budget (10.3 percent of GDP) to social services and poverty alleviation. In addition the old system of transfers was replaced by targeted poverty family cash benefits. Eligibility for this benefit is initially screened based on a proxy means formula, with actual benefit allotment subject to additional filtering. Initially more than 230,000 families were receiving the benefit (28 percent of the total number of families). Gradually, due to better screening and improved benefit administration the number of recipient families was reduced to 190,000.

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

<u>Sector Issues to be Addressed under the Project</u>

Natural Resources Management. The proposed project will support improved natural resources management by: (i) building skills for participatory resource management; (ii) strengthening institutional capacity of the relevant sectoral agencies, to plan, implement, monitor resource

management at the central, regional and local levels; (iii) implementing watershed management activities, including improved management of farmland, range, forest, and fisheries and biodiversity conservation in the production landscape; (iv) strengthening agricultural extension services to farmers; and (v) supporting sustainable productive activities that bring increases in incomes.

Rural Poverty-Environment Linkages. The project is located in some of the most impoverished areas in Armenia which host the highest levels of biodiversity in the region. The natural resources are currently under the threat from a vicious cycle of poverty and natural resources degradation. The project will alleviate poverty in two ways. First it will address the immediate needs of the population through a series of targeted work fare programs that provide beneficiaries with income. Second, it will improve farmers skills in implementing more sustainable production techniques through demonstration activities and extension. Third, it will provide farmers with investment opportunities in more sustainable technical production packages that will enable them to produce a marketable agricultural surplus. As such the project is expected to make significant contribution to raise local incomes by introducing sustainable agricultural practices while protecting globally and regionally important biodiversity resources and cultural values.

Policy and Institutional Reforms. The key policy and institutional reforms to be sought under the project is the introduction of community based management of common resources by community organizations representing users and the authorities charged with these functions. The success of the reform will be measured by the increasing responsibility and participation of local communities in the planning and decision making, increased institutional and human capacity and technical knowledge. The reform process will build on integration of environmental, agricultural and forest policies and institutional structures established for their implementation.

Strategic Choices

Government support is essential to promote adequate resource management to reduce deterioration of environment in both rural and urban areas. Therefore programs introducing appropriate techniques for the rational use of natural resources (soil, forest , pastures, biological resources), need to be expanded to cover a greater areas in Armenia. Because of the Government's commitment to alleviate poverty in rural areas, the project will pay greater attention to rural mountainous and border communities in two pilot regions, which have less choices and opportunities to resort to other than farming to sustain their living. There is no viable long term alternative than to protect the viability of agriculture as a means of supporting rural households.

The Project will develop a community-based incentive structure, which aims to reduce current resource mining practices and which encourages alternative, environmentally less destructive activities. There are currently no other projects in Armenia which seek or are capable of achieving this multipurpose goal.

C: Project Description Summary

The project aims at identifying, developing and offering new options for poverty reduction in rural areas by supporting sustainable productive activities targeted to reduce pressure on environmentally sensitive areas and, on the productive natural resource base in the micro-catchment areas.

1. Project approach and key components (see Annex 2 for a detailed description and Annex 3 for

a detailed cost breakdown):

Component	Category	Cost Incl. Contingencies (US$M)	% of Total	IDA/Bank-financing (US$M)	% of Bank-financing	GEF Financing (US$M
A. Participatory Watershed Management		5.0	31.3	3.9	42.1	1.0
B: Forest Management		5.75	35.9	4.5	47.4	0.4
C. Protected Areas Management		4.0	25.0	0.25	2.6	3.5
D. Project Management		1.25	7.8	0.75	7.9	0.1
Total baseline cost		16.0	100%	9.5	100	5.0

Project approach

The project's fundamental approach is based on close integration of investments into productive rural infrastructure, natural resources and human and institutional capital, in a way that reduces pressure on the environment and natural resources and improves the living standards of the people who depend on using these resources for their livelihoods. Biodiversity conservation and poverty reduction are the project's cross cutting themes and thus combine the three project components and related activities described below. To measure the medium-term impacts from the proposed project, an appropriate approach will be to implement activity plans in spatially defined units (i.e. watersheds) where the impact of human pressures on the resource base is immediate. Project areas beyond the boundaries of the pre-identified watersheds will include sites where the impacts of unregulated use of common resources has reached unsustainable levels.

Project components

The project has four major components, three of which (components A, B, and C) benefit from GEF financing.

Component A. Participatory Watershed Management. (IDA US$3.9 mill., GEF US$ 0.75 mill., Other US$ 0.35 mill)). The participatory watershed management focuses on introducing sustainable use and improved management of production landscape resources (soil, water and pastures for crop and livestock production) in selected micro-catchments. The two marzas contain biodiversity and critical natural habitats of global importance (see Annex 3.1). This component will protect the environmental services of watersheds such as hydrological regulation, carbon sequestration, and soil conservation by promoting the protection and natural rehabilitation of degraded habitats outside of the two project protected areas addressed under Component C. The component includes activities to retain natural resources base and mountain ecosystem values and mountain biodiversity (IDA/GEF blend), demonstrate and support sustainable agricultural practices (IDA only), and support income generating activities to help reduce poverty (IDA only). Integration with forest resource management component will be achieved through agro-forestry, modified forest grazing and community forestry activities (IDA only).

The Ministry of Nature Protection in close collaboration with regional authorities and agricultural support centers (extension services) will be in charge with the implementation of the component. To ensure that the project achieves its goals, contractual agreements will be negotiated with participating communities that create a balance between the productive resource use activities that generate short-term direct economic/financial benefits (i.e. poverty reduction) and forest and watershed resource management activities, which generate long-term public/private benefits (i.e. biodiversity conservation and watershed management. Key component outputs include:

A1: ***Protection of watershed and mountain forest values***. (US$0.6m of which US$0.4m is from GEF). This subcomponent would finance: (i) preparation of micro-catchment plans. The project would provide technical assistance to the villagers in problem identification and matching the menu of watershed protection measures which address these problems; and (ii) the implementation of the first phase of these plans, with contributions (e.g., labor) provided by the villagers. Based on consultations held early in project preparation, the investments are expected to include establishment of multi-purpose trees on field boundaries and forest margins; rehabilitation of field tracks; stabilization and rehabilitation of active gullies; and restoration of vegetation cover on degraded lands using grazing exclusion zones, afforestation, and seeding with grasses and shrubs.

One section of the catchment plans would be dedicated to integrating the objectives and general activities of the three types of investments in the catchment: community based investment in agriculture and pasture management (Component A), forest management (Component B), and protected areas management (Component C). GEF would finance development of GIS assisted catchment plans for the two marzes covered under the project, which integrate the agriculture, forestry, rangeland and protected areas management activities at the landscape level. The catchment plans would include prescriptions for integrating biodiversity conservation into the IDA-financed economic activities, and corridors for connecting protected areas within the project region in Armenia, and the transborder region with Georgia. The landscape corridor linkages would be developed in collaboration with three projects in neighboring Georgia: the landscape level protected areas planning activities under the Protected Areas Development Project (GEF, $9 million) and Forests Development (IDA, $20 million), and the Borjomi-Karagauli National Park Project, financed by kfW. The Borjomi Karagauli National Park is not a transborder park with Dilijan State Reserve, but these protected areas are located in the same region of the Lesser Caucasus Mountains and share in common, large mammal populations with seasonal and annual migration patterns which require coordinated protection inside the protected areas and the maintenance of movement corridors between the protected areas. The TA would be provided to villagers, public sector staff, and various specialists engaged in preparation of the plans.

A2: ***Sustainable pasture management and protection of mountain biodiversity*** (IDA US$1.4 mill.; GEF US$0.6 mill). Financing will be provided for establishing livestock watering points in selected summer pastures; enrichment planting and harvesting of non-wood forest products including berries, fruits and mushrooms; and demonstrating sustainable pasture and meadow management systems, and rehabilitation of hey meadows. These activities are consistent with Strategy for Sustainable Rural Development and the Biodiversity Strategy and Action Plan (1999). Categories financed under the sub-component include small works and services. The GEF funds will be used to co-finance the costs for the recovery of alpine meadows and steppes, including re-seeding with indigenous grass species, native wild fruit trees and non-wood forest products.

A3: ***Sustainable agricultural practices and services***. (IDA US$0.5 mill.; Other US$0.25 mill). Financing will be provided for strengthening existing Agricultural Support Centers and other

extension service providers such as NGOs and community-based organizations to demonstrate and support credit access for adoption of best management practices for winter wheat, spring barley, food and seed potato, and farm mechanization. Project financial support will be provided for demonstrations and information services and facilitating access to existing credit resources.

A4: ***Community infrastructure and income generation***. (IDA US$1.4 mill,). Support for improvement of tertiary and gravity-fed irrigation systems, in collaboration with IFAD, production and processing activities (e.g. bee keeping enterprises; fruit and vegetable production, meat production from cattle, sheep and pigs, small-scale meat and milk processing, small-scale fruit drying, planning for eco-tourism). In the case of demonstration activities, goods will be procured based on cost-sharing arrangements to be established in agreement with communities.

Component B: Forest Management. (IDA US$4.5 mill; GEF US$0.4 mill.; Others US$0.5 mill.)

The forest management component would support rehabilitation of degraded forest, forest conservation and community based sustainable forest management practices in and near the project watersheds. The project will finance works, goods and services to rehabilitate degraded forests, apply sustainable forest management and biodiversity practices and enable benefit sharing with neighboring forest communities.

Improvement/ rehabilitation of degraded forest shall be achieved with direct involvement of local population and local stakeholders. To ensure that beneficiary communities cooperate in protection of new plantations micro-catchment plans will include incentive based agreements. Additional income will be generated through direct payments for agreed work programs or through compensation in kind (seeds, fertilizers, rehabilitation of infrastructure etc.). Community involvement in forest management is sustained through contractual arrangements with villages and/or farm households which transfer the responsibility for implementation of agreed works (e.g. responsibility for rehabilitation/ planting) in return to permits for controlled harvest of non-timber forest products (i.e. wild berries, walnuts, etc.). Primary implementation responsibility for the Forest Management component lays with the Hyantar and its local structures. Regional and local administrations of Hayantar would have an important role in the selection of pilot areas and in organizing the implementation of agreed work programs. It is anticipated that forests on former Kolchoz land shall be transferred to the community/village ownership. The project will support introduction and implementation of relevant changes in the Forest code and corresponding by-laws in order to create the enabling legal environment for the ownership transfer. This component will be carried out in close collaboration with the Watershed Management Component.

B1: Community Forest and Pasture Management (former Kolchoz lands) (IDA US$1.75 mill; GEF US$0.1 mill.). The sub-component will provide financial support for (a) transferring former Kolchoz forest land to villages on the basis of lease agreements; (b) preparation and implementation of participatory community forest and pasture management plans; (c) planting of multi-purpose bushes and trees; (d) rehabilitating of eroded soil and prevention of surface flooding; (e) developing of regeneration and coppicing models; (f) increasing technical capacities in villages. GEF would finance technical assistance on practical measures for conserving biodiversity, to be incorporated into the community forest and range plans, and in implementing these.

B2: ***Demonstration of sustainable forest management practices in selected pilot areas on state forest land*** (IDA US$2.5 mill.). The sub-component will finance (a) preparation and implementation of State forest management plans, including studies of biodiversity at the forest

unit as inputs to the forest management plans; (b) pre-commercial thinning and thinning of pole stands in naturally regenerated forests; (c) measures for regeneration of over-mature, partially disintegrating stands by applying group selection felling and low impact harvesting methods; (d) technical assistance in achieving independent forest certification and auditing at the example of Zikatar experimental and demonstration forest; and (e) measures for strengthening operational capacities of forest service (Hayantar) and its local branches, Ministry of Nature Protection and villages involved in forest management operations/investments.

***B3**: Strengthening of legal, institutional , policy and human capacities for sustainable forest management, biodiversity conservation in key natural resource institutions*. (IDA US$0.25 mill.; GEF US$0.3 mill.; Others US$0.5 mill). This sub-component will provide finances to establish the necessary legal, institutional and human resources platform for implementation of other activities through: (a) reforming and adapting the legal framework towards sustainable forest management, biodiversity conservation and communal involvement; (b) supporting the development of a national forest policy and strategy program; (c) undertaking restructuring of the forest administration, including separation of administrative and commercial functions; (d) introducing innovative marketing and pricing methods; (e) launching a program against illegal logging and corruption, including strengthening of inspection services; (f) developing and implementing a training program for key forest stakeholders, including the development of the Zikatar (forest education center) facilities as a training and demonstration center. GEF funds would finance public education activities on the significance of Armenian forest biodiversity, technical assistance in improving the policy framework for biodiversity conservation and mainstreaming it into national forest laws and regulations.

Component C: ***Protected Areas Management.*** (IDA US$0.25 mill.; GEF US$3.5 mill.; Others US$0.25 mill.). The objective of this component is to strengthen the management of Dilijan State Reserve (28,000 ha) and Lake Sevan National Park (120,000 ha) through investments in improved protected area management and mechanisms for management of revenues for long term sustainability. The These protected areas contain threatened and representative biodiversity and landscape diversity of the Armenian Caucasus. The subcomponents are:

C1. Build capacity to administer the system of protected areas and public awareness for biodiversity conservation: (US$0.5 GEF) The project would build capacity at the national and local levels of the Department of Protected Areas through: (i) developing best practices in mainstreaming biodiversity conservation into natural resource management practices (especially forest and range management) and incorporating these into the National Natural Resources Management Strategy, and enhancing strategic planning capacity within of institutions responsible for coordinating natural resources use across line ministries, policy analysis and stakeholder participation (Donor financing will be sought for this element); (ii) improving the national legal and regulatory framework for protected areas and flora and fauna conservation; (iii) training for the Department of Specially Protected Areas and Flora and Fauna Protection in the Ministry of Nature Protection in protected area network planning and park administration, public environmental education, and public/private partnerships in park management and revenue generation; and (iv) exchange of regional expertise with Georgia on transboundary cooperation in protected areas management.

***C2. Improve the management of Dilijan Reserve and Sevan Park** . (US$1.5 GEF)*The sub-component will finance preparation and implementation of the management plans for Lake Sevan National Park and Dilijan Nature Reserve. The management plan for Dilijan Nature Reserve would define a new buffer zone for the reserve, comprised of surrounding state forests, and include prescriptions for its management along with the nature reserve itself. The activities to be

implemented are: (i) preparation of the management plans, and technical resource management studies and consultations with the main stakeholders; (ii) applied studies which inform practical management needs of the protected areas (and buffer zone for Dilijan Nature Reserve); (iii) improved ranger services, especially to protect against illegal hunting and logging; (iv) environmental education and public community outreach to build public awareness of the protected area's objectives and encourage participation of local communities in the project; (v) training and workshops for protected areas staff and local user groups in protected areas management and resource management (especially of forests and pastures within permitted use zones within Lake Sevan National Park); and (vi) technical studies and consultations for developing and testing indicators for monitoring the effectiveness of plan implementation; (vii) establishment of a revenue account from visitor and resource use fees for maintaining project investments in the operational phase.

C3. Establish basic infrastructure for park management.(US$1.0 GEF) The sub-component will finance the rehabilitation/construction of park administration/visitor center in each protected area, environmental educational facilities; informational kiosks.

C4. Small Grant Scheme for community based activities in the protected areas and their buffer zones**:** (US$0.5 GEF) Communities located inside or adjacent to the protected areas would be eligible to apply for small grants (maximum grant $10,000, total program cost US$0.5M). The grants will support small-scale local initiatives related to biodiversity conservation which will reduce pressure on the protected areas and biological resources while at the same time improving local livelihoods and enhancing socio-economic development. The sub-projects financed by the SGP will be developed and implemented by local communities, NGOs and individuals living in villages around the project protected areas. The component would finance model projects or provide seed funding for sustainable activities that have the potential to develop an alternative income stream for local communities, mitigating at the same time pressures on their natural resources base. Activities will include the development of model or pilot projects for sustainable grazing and forestry practices with direct incremental biodiversity benefits, or the provision of seed funding for activities that have the potential to develop alternative livelihoods which reduce pressure on protected areas and their biological resources. The SGP will finance biodiversity conservation initiatives (bird counts, training hunters to avoid rare species etc).

The grants funds are expected to provide incentive to local communities and community groups to contain the negative impacts of their behaviors through capturing benefits associated with conservation linked to the development. The communities interests and incentives through drawing linkages between immediate needs of local communities (e.g. improved livelihoods) and conservation of biodiversity resources in global significance. Grants will be made available on a competitive basis. Specific eligibility criteria will be developed and agreed during appraisal and included in the PIP.

Component D. ***Project Management and Administration***. (IDA US$0.75 mill; US$ 0.1 GEF; Others US$0.5 mill.). The component will provide support to project administration and implementation including incremental operational costs for the PMT, essential technical assistance for project management (e.g. financial management training, project audit, institutional coordination, implementation assistance to communities and public sector training for capacity building, basic equipment and facilities, and operating cost of the PMU). Organizational chart, which will be further developed in detail during appraisal. Agreement on project organization and management and institutional responsibilities will be sought during appraisal and negotiations.

3. Benefits and target population:

The project's target population lives in some of the poorest regions in Armenia. These regions have a limited resource base - subject to extensive resource degradation, i.e. mountainous border areas in Northern Armenia and the Lake Sevan watershed (i.e. Tavoush and Gegkharkunik) and limited alternative income generating opportunities outside rural farming.

The project would have social, economic, institutional and environmental benefits both at the local and global level. The project will benefit the rural population of 226,000, 30,000 of whom are refugees, currently living in the two marzes. The project beneficiaries are initially 19 rural communities. They will increase to 40 by the end of the project. The selection of the additional communities (to be carried out by the PIU) will be based on criteria tested during the first two years of implementation and in a transparent and participatory manner. The project will benefit a significant number of rural poor living below the poverty line which will benefit from the project by improving their living conditions, increasing household incomes, and introducing better natural resource management practices. It has been estimated that project interventions will help improve livestock and crop productivity and contribute to increase of rural incomes in the Lake Sevan watershed alone, where some 25% of farmlands on the southern slopes of Sevan's mountain chain now has been abandoned, and the productivity of the remaining farmland is declining as a result of soil erosion. The project would also provide benefits to wider population in Gegharkunik and Tavous marzas through protection of ecosystem services, such as watershed protection to maintain water supply during the dry seasons and improve resilience against natural disasters (drought).

Project assistance for capacity building will result in stronger community ownership and administrative capacity at the local level and stronger roots of civil society. With regard to the technology benefits, the project would allow testing and demonstration of the suitability of various sustainable agricultural practices and technologies to address degradation of natural resources under Armenian's geographical, climatic, social, cultural conditions.

The environmental benefits from this project would accrue at the local, regional and global levels. At the regional level it will contribute to establishing a stable and more effective protected area network adding to the biodiversity effort in the Southern Caucasus Mountains, an area with globally significant wildlife and numerous threatened endemic species. At the global level it will help safeguard a vast variety of endangered and relic species especially important for the conservation and sustainable use of agro-biodiversity. In respect to the endemic plants of Sevan Lake located in the high altitude areas, the following are particularly noteworthy: *Sorbus hajastana, Acantholimon gabrieljanae, Vicia akhmaganika, Vicia grossheimii, Larus ,komarovii, Achilea smirnovii, Crepis vildenovii* and other relic plants preserved from pre-historic times (golocen,plyocen). The project would help restore and safeguard forest and vegetation cover and habitat which will contribute to the expansion of carbon sinks in the region. At the national and local levels the project will provide support to ensure protection of the country's natural assets at a time the Government is laying down the foundations of sustainable economic growth. At the local level the project will link the welfare of communities to the protection of biodiversity and will help them to develop greater economic self-sufficiency, thus contributing to local growth.

4. Institutional and implementation arrangements:

<u>Implementation period.</u> The project would be implemented over a period of six years. It may be better to adopt a "learn as we go" approach where selected pilot micro-catchment management plans will be prepared and implemented before project effectiveness (a possibility for a PPF financing facility to prepare seasonal activities will be discussed during appraisal). Technical

assistance to beneficiaries of selected communities will be provided to build up skills and knowledge and ensure adequate absorption capacity for project investments. Scaling will then be done for the first year's activities, based on the results of the pilot projects.

Project leading agency. The Ministry of Nature Protection (MONP) would be the leading agency responsible for project oversight and implementation the project activities in close coordination with the Ministry of Agriculture (MOA) and other stakeholder agencies and beneficiary groups. Forest management and protected areas activities will be the responsibility of the Department of Forestry (Hyantar) and the Department of Protected Areas, respectively within the MONP. A Project Implementation Unit will be established in the MONP with core technical units which would supervise and provide technical advice for the implementation of the project. Although the institutional capacity is generally still weak in Armenia, the MONP has effectively demonstrated its good project implementation capacity through successful implementation of the Bank funded National Environmental Action Plan and the Lake Sevan Action Plan.

Project coordination and management. MONP would be responsible for coordinating activities with the MOA and other stakeholder agencies. Forest management and protected areas activities will be the responsibility of the Department of Forestry (Hyantar) and the Department of Protected Areas, respectively. MOA will be directly involved in implementation of sustainable crop and livestock production activities at the watershed level through their existing network of Agricultural Support Centers, who will have a critical role in dissemination of technical packages through establishing demonstration activities, farmers training and extension. The mechanisms for coordinating the activities of the two ministries and the two departments within MONP will be developed during preparation. Partnerships between locally based NGOs and society groups, research organizations and community groups would be used in planning and implementation of community-level activities. The implementation of the project will build on NGO experience and existing community arrangements. Consultation with society organizations during preparation indicated strong willingness to provide services during project implementation. Potential partners include the following organizations: Agridevelopment, National Union of Framers, Shen NGO, Foundation of Applied Research and Agribusiness (FARA), Armenia Tree Project, CARE Armenia Branch, Green Unions, EDEM Plant Protection, Division of Nature, Institutes of Botany, Zoology and Agriculture of the Armenian Academy of Sciences.

Project Implementation Unit

The Project Preparation Unit would be expanded and strengthened to take over project management and implementation responsibilities. The PIU will be headed by a full time director and will include technical and administrative staff. Its responsibilities would include: (i) through the Project Management Board, ensure the co-ordination and timely support of the main project stakeholders in implementing the project; (ii) preparation of annual work plans and budget; (iii) recruitment and management of foreign and national consultants; (iv) approve disbursements of project funds for various activities; (v) prepare and submit to the Bank progress reports, consolidated withdrawal applications, detailed project account and audits; (vi) arrange procurement; (vii) undertake project monitoring of physical and financial progress and evaluation of project impact. The PIU staff will consist of technical and administrative staff. Organizational an functional structure and responsibilities will be developed in details during appraisal.

The PIU will procure services for implementation support to communities from local NGOs, which have records of experience in community development. The project implementation consultant will be responsible for providing technical support and supervise the implementation

of annual community programs at the field. In particular this will involve the supervision of field work undertaken by contractors, technical supervision, quality control, liaison with local governments and institutions, handling complaints, public relations, assistance with planning and budgeting. The contracted local NGOs will be authorized to make limited decisions, beyond which they will seek PIU's clearance. This interim level of project management is justified given the complexity of project implementation and the need for local beneficiaries, stakeholders and contractors to accumulate experience with the project and have a local point of contact. Stronger involvement of local NGOs would be valuable to achieve desired results through building on local knowledge and capacity and wider involvement of civil society. It would also have the effect of establishing a project presence at local level.

Delivery of project inputs will mainly be through established institutions working either under direct contractual terms or in formal collaboration with the project. *Inter alia* these would include; rural credit providers, local NGOs and society groups involved in community development, other donor projects, specialist agencies.

Project Management Board

The Project Management Board (PMB)[1] established for the preparation of the project will continue functioning during project implementation. Minister of Nature Protection will be the Chairman of the Board. According to Armenian regulations, the representatives of the Ministry of Finance and Economy, as well as the Staff of the Government should be represented there. However, taking into consideration the multi-sectoral nature of the project, Ministry of Agriculture, Ministry of Social Welfare, State Department of Cadastre will also be represented in the Board. Representatives of Tavoush and Gegharkunik marzas will have a deliberative voice in the Board. The PMB will have the following functions and responsibilities: (i) supervision of the PIU activities; (ii) supervision of the use of financial resources; (iii) after the approval of the Credit/Grant Agreement by the National Assembly, discussion and approval of the annual work schedule and budget of the project; (iv) endorsement of the project reports; (v) approval of the results of work, services and goods procurement tenders; (vi) presentation of the proposals to the Government of Armenia on the use of saved financial resources (upon discussion and agreement with funding institutions); (vii) identification of shortcomings in the reports presented by PIU and development of measures for rectifying them, as well supervision and control over the implementation of those measures; (viii) meeting and discussions with the representatives of project funding institutions, and presentation of the results of those consultation to the Government of Armenia; (ix) wrap-up of the results of the project upon completion of the project, and presentation of the results to the Government of Armenia.

Implementation arrangements at micro-catchment level. The project implementation arrangements for planning and activity implementation at the local level are set out in the Guidelines for Participatory Watershed Management, developed during preparation. The project will strengthen existing village-level institutions for project management and administration and support establishment of informal community based groups for implementation of investment activities, including:

- Village Watershed Management Forum. The Forum will be a legal entity which is based on the existing local government organizations – i.e. Village Councils. It mainly has administrative functions in managing project activities. The Forum will be responsible

[1] Institutionalizing a Project Management Board is a requirement of the Armenian legislation [Regulation No. dated……]

for: (a) coordinating the project implementation activities; (b) preparation of annual village implementation plans; (c) management the flow of project funds to Village Resource Management Associations; (d) monitoring and reporting of the use of project funds, including book keeping; (e) monitoring of the technical quality and standards of project investments and facilitation of technical assistance to project implementation groups; (f) dissemination of information to local communities (communication between PMO and villagers); (g) communication and consultations with Marza and national government bodies; (h) provide interface between Hayantar and other government implementation agencies (i.e. protected areas management, agricultural service stations; etc.); (i) coordination of project implementation plans and arrangements with other projects at the village/watershed level; (j) communication of national policy directions and program opportunities to local communities; (k) coordination of preparation of annual watershed management and implementation plans with other Village Watershed Management Forums in the watershed ; and (l) coordination of project implementation arrangements with other villages in the watershed. The Forum will be responsible for issuing a property rights to forest resources (an annual sustainable fuel wood harvest right and an annual sustainable NTFP harvest right) in addition to existing allocation of pasture and water use rights. The membership in the Forums is based on existing freely elected Village Councils plus elected representatives of Village Resource User Associations. It is also expected that the representatives of these Resource Management Associations will participate actively in the day-to-day activities of the Forum.

- Village Resource Management Associations are community based implementing bodies representing individuals and community sub-groups with interests in management of common resources owned by the village – i.e. forest (fuel wood or non-timber forest products), pasture or water resources (i.e. existing village water associations or would result in these property rights being forfeited by the owner and returned to the association. Differently fro Village similar water user organisations). The Village Resource Management Associations take responsibility for implementing agreed management strategies in the forest, pastures and other common natural resources. Only members of the association would be entitled to hold forest and other natural resource property rights, and default on credit repayments or management requirements Forums, associations are non-formal entities. All associations have to register themselves with the PMO before they can have access to project funds. The purpose of registration is to create identity and formulate the association, which would ensure the accountability mechanism if the association misuses funds. Lending guarantees must be provided by the Village Forums. Existing Agricultural Support Centers will be contracted by the PMU to assist village resource management groups in planning and implementing of community based soil control, forestry, pasture and water management sub-projects. They will be also responsible for implementing and replicating activities which demonstrate the potential for sustainable agricultural and natural resource management. In order to strengthen implementation capacity of community groups and disseminate information about the successful practices Agricultural Support Center staff will be contracted to provide farmers training and extension support. Demand for extension services will be generated through performance based contracts between project farmers and community groups, where extension agents earn commissions based on the demand for their services.

- Local NGOs will be contracted by the PMU to carry out independent monitoring of project implementation activities and efficient and transparent use of project funds through frequent site visits, significant site presence, and preparation and dissemination

of public information. They may also provide village resource management associations technical assistance in planning and implementing sub-projects and activities. Furthermore, when the Village Watershed Management Forum does not have the sufficient institutional capacity to administer or implement a sub-projects, they may enter into agreement with qualified local NGOs to act as the implementing agency on behalf of the village forum.

The project will strengthen the capacity of relevant state agencies to achieve the long-term environmental reform agenda in Armenia. The project would enhance the strong cooperation at all levels between Ministry of Nature Protection and Ministry of Finance, and other sector Ministries such as Ministry of Agriculture and Territorial Administration, Social Welfare, and local governments. The project would seek consensus among the relevant government agencies regarding implementation responsibilities, focusing on coordination at the watershed level. It will make provisions for local society groups and native culture participation throughout the three project components.

The majority of the project's capacity building activities, are community-based which would empower their involvement in the management of the local resource base and build the skills needed to succeed. Specifically, the project will build the local capacity to absorb the project investments before the disbursement of the funds starts. However, in order to change behavior at the local level, there is a need to focus more on the *interface* between the local communities and local departments of national government agencies, which will be responsible for project implementation on the ground. The project intends to form partnerships with local society groups for independent monitoring of project activities to complement project implementation arrangements, especially at the local level.

The project design responds directly to the beneficiaries development priorities. For the poor, 33 percent identify agriculture and 20 percent identify reducing employment 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. The project couples workfare programs with farmer technical assistance packages. By providing income earning opportunities, the workfare programs will pay poor people to protect and increase productivity of local natural resources and give them the opportunity to invest their earnings in increasing the productivity of their agricultural land. Examples of these programs include the construction of pasture watering points, rehabilitation of rural access roads, fertilization of community pastures, community forest enrichment, planting and protection. The wage offered to beneficiaries to participate in these programs would be set at the minimum wage level to ensure self – selection of the poor. Continuous supervision and monitoring during implementation of annual micro-catchment programs will ensure targeting the poor members of communities.

D: Project Rationale

1. Project alternatives considered and reasons for rejection

No project alternative. The alternative of not addressing the current scenario of rural poverty and natural resources degradation was rejected because of the high economic and social costs associated with the gradual degradation and destruction of the country's natural resources.

Adaptable Program Lending. A three-phase project was originally recommended. The first phase would concentrate on policy reform and institutional capacity building measures identified in the National Environmental Action Program. The second and third phases would focus on environmental infrastructure investments. This alternative was dropped because: (i) institutional reform and organizational behavior changes could require considerable time -- probably more

time than initially anticipated; (ii) uncertain capacity to implement a broad program of legal and institutional reform, and (iii) availability of IDA funds for subsequent interventions is uncertain.

GEF Support for Conserving Biodiversity in Selected Protected Natural Areas. The project activities proposed for GEF financing could have focused largely or exclusively on protected areas. This approach was rejected for two reasons: (i) the current project design provides an opportunity to contribute to the national and global environmental objectives by using GEF financing to obtain the "incremental" global environmental benefits in all of the project components; and (ii) the challenge of realization of biodiversity does not lend itself to a strict protection approach, but rather to improve management of natural resources at the local level.

Country-wide coverage versus strategic watersheds. The geographic scope of project will be limited to priority environmentally sensitive watersheds, such as the Lake Sevan watershed, and other mountainous/boarder areas watersheds, with high level of poverty and unique cultural and ecological values subject to degradation and depletion.

Long-term sustainability versus short-term gains. This project aims at reducing poverty in rural areas through activities that are compatible with long term sustainability goals rather than focusing on activities that satisfy immediate social needs of rural communities-- which is the focus of SIFI and SIF II projects.

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

Sector issue	Project	Latest Supervision (Form 590) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
Bank-financed			
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
Develop a mitigation plan to address the ecological problems of Lake Sevan.	Lake Sevan Action Program – IDF Grant (FY96)		S
Other development agencies			
The Netherlands Government (Grant)	Integrated Water Resources Management Plan (Bank executed)		S

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 – UNEP	Phasing out Ozone Depleting Substances, 05/97-02/98		
Global Environment Facility - GEF, UNDP	Biodiversity – Strategy and Action Plan 08/97-08/98		S
GEF, UNDP	Armenia Country Study on Climate Change 09/96-09/98		S
UNDP	Strengthening MoNP 05/97-01/99		S
Swedish International Cooperation Agency – SIDA	Forest Resources Assessment 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:

While there is a lot of experience in implementing projects with a dual natural resources management and poverty alleviation objectives in the other regions in the Bank, the proposed intervention is still relatively new and untested in the NIS/CIS countries, although some good practices exist in the region (i.e. Albania Forestry Project). The main lessons from the review of the Bank's global experience in natural resources management and poverty alleviation projects are as follows:

- The experience from similar multi objective projects in the Bank shows that it is important to clearly identify the linkages between project interventions and the change of natural resources use at the local level is needed, and how it will feed into poverty reduction. Therefore, it is important that the project has very clear, tangible and quantifiable development objectives and monitoring indicators in place to avoid disbursing the funds for activities whose sustainability is questionable or which have little overall impact on the sustainable management of natural resources;

- Professional development and training programs are an important instrument in providing the underpinnings for changing behavior of private and public actors in environmental and natural resources management;

- Active participation of beneficiaries is important in achieving effective, efficient and sustainable delivery and provision of basic services and the management of natural resources;

- Adequate attention needs to be given to the financial sustainability of natural resources management efforts;

- Project design in terms of number of actors and components 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, while attempting to cover a diverse number of issues with high number of components and sub-components which has placed a large implementation and coordination burden on very young and inexperienced environmental/natural resources management agencies; and

- Communication and outreach and ownership building are essential to the development of successful participatory natural resources management strategies and conservation of protected areas.

Lessons learned from other projects in Armenia point to the following critical issues:

- There is a need for improved inter-sectoral and inter-agency coordination. The project will develop mechanisms to strengthen effective cooperation among the relevant Government structures and agencies to ensure effective implementation of the proposed activities;

- Decentralization of decision making at the local level is critical to make the project demand driven and to strengthen project ownership. The project will encourage decentralization of project implementation activities through building partnerships and stakeholder participation at the local level through information dissemination and active involvement of stakeholders at all stages of the project cycle;

- 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. The proposed project will focus heavily on building the needed capacity at the local level; and

- This project concept revolves around the above lessons. Its design is based heavily on community-based and participatory approaches.

The main areas identified by the STAP reviewer are:

(i) Ensure stakeholders participation and firm commitment of the authority ultimately responsible for project success to undertake actions for institutional coordination on cross cutting scientific, technical, economical and operational project issues. The document will further benefit from evaluation of the implementation responsibilities in the context of the institutional issues as set forth in the document.

(ii) Strengthen analysis on the linkages between biodiversity and poverty especially to show how supporting one will support the other particularly in agriculture.

4. Indications of borrower commitment and ownership:

The Government of Armenia is committed to improve its environmental quality and natural resources. The NEAP, adopted by the Cabinet of Ministers in December 1998, identified Armenia's environmental goals, objectives and priority activities to prevent further degradation of

its natural resources. There is a commitment by the Government of Armenia, also from the part of the Ministry of Finance, Ministry of Social Welfare and Ministry of Territorial Development, to adopt demand-driven approaches to the provision of rural social and environmental services. The Government submitted a request for Bank and GEF assistance and preliminary support for the project across key Ministries was obtained during project preparation. An endorsement letter from the GEF Focal Point is attached.

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

The project will allow to continue support to the implementation of a number of measures of the Environmental reform agenda for improving the management of Armenia natural resources. The value added of Bank support in this project lies in its global experience in: (i) assistance in developing a community-based strategy for natural resources management; (ii) establishing a sustainable institutional framework for natural resources management; and (iii) acting as catalyst for mobilizing co-financing from various multilateral and bilateral sources to contribute towards the project needs and future investments.

The Bank's involvement would allow valuable lessons and initiatives tested by the project to be scaled up into a larger program in the future, as well as to use them for 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.

The GEF value added comes from its global experience on the design, implementation, and financing of biodiversity conservation projects. The 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. Other benefits from the GEF involvement include:

- The project will have closer links to other GEF financed projects (UNDP) projects in Armenia (Lake Gilli Biodiversity Conservation Project and In-Situ Conservation and Sustainable Use of Agro-biodiversity) and benefits from lessons learned, best practice and activities and materials developed under those projects; and

- 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, and strengthened biodiversity monitoring and evaluation, review, and scientific oversight.

GOA and NGOs in the country would not be able to 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.

E: Summary Project Analysis

Economic

General. The project will produce benefits that are: (a) within the project area, (b) downstream, and (c) global or regional beyond the project areas. Most of the project measures will bring different types of direct and indirect economic and environmental benefits affecting different areas. During project preparation, economic analysis played an important role in identifying costs, benefits and risks, and in evaluating design alternatives. An integrated overall cost benefit

analysis (i.e. ERR) would be carried out for the project as a whole. The costs and benefits of household based activities would be analyzed based on sample investment activities which will be derived from various technical packages.

Methodology of Economic Analysis. The majority of economic benefits to communities will occur at the watershed level. The project economic/financial analysis will focus thus on area analysis, where the feasibility of the various project activities will be assessed through evaluating the change in the value of farm production from the project area (i.e. watershed), where various project activities enter as inputs that influence the total value of final farm output. The economic analysis would be based on farm household and enterprise models, which define beneficiaries' responses to the proposed investments. Estimated project costs will be deducted from the benefits to derive the net economic benefits. The net present value (NPV) and Economic Rate of Return (ERR) will be estimated for different scenarios of expected farm output mixes in project area and sensitivity and risk analysis will be carried out to determine the robustness of the estimates. Economic benefits from grasslands and pasture improvement would be quantified through improved livestock productivity. To the extent possible, the analyses would quantify on-site indirect benefits from protection of natural resource base through long-term productivity gains and reduced risks of weather related damages.

The timber benefits of the project's forestry component would come form the establishment of new forests and the rehabilitation of old ones for timber production. The benefits of new tree plantations are calculated using the Allowable Annual Cut (AAC) approach. The Allowable Annual Cut (AAC) approach is based on the assumption that new areas are added to a forest and where there are over-mature stands in the forest. As such, the AAC can be increased long before the new areas themselves become ready for harvesting[1].

The analysis will quantify, to the extent possible, downstream environmental benefits generated by the project investments. It is expected that downstream environmental benefits will result mainly from reduced resource soil erosion (increased economic life of irrigation infrastructures through reduced siltation and sedimentation flow) and water hydrology stabilization (i.e. reduced risks of flooding and water shortages). The analysis will also attempt to quantify in monetary terms the benefits resulting from increased vegetation (i.e. carbon sequestration).

Cost Effectiveness Analysis. "Soft" components (such as provision of extension services, formation of herders associations, training, research, and capacity building, etc.) would be analyzed through cost effectiveness analyses. Since benefits of such activities either do not have a readily available market price or are not easily measurable in monetary terms, the economic analysis in these cases would measure the costs of different ways of achieving a given benefit (e.g. a certain number of groups formed and operational, a certain number of people trained, etc.). Cost effectiveness analysis will be also used for investments that generate global and regional environmental benefits (i.e. biodiversity conservation and protection of ecosystems life support functions).

Incremental Cost Analysis. The incremental cost analysis is presented in Annex 2. The baseline cost without GEF Alternative includes current GOA expenditures on the natural resources management and biodiversity conservation over the life of the project, forestry

[1] AAC is based on a long-term average increment of the timber (i.e. until the day when the new stands are harvested), not on immediate increment of new forest plantation areas, which can be very low or zero during the initial years. After establishment of new tree plantations we can afford to "over cut" the old stands in terms of both area and volume because when we come to the end of the pre-addition forest the added area will be there to take over and to ensure a sustained yield.

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 marzas. The full cost of implementing the Baseline Scenario over the life of the project is estimated as US$20.1 million. 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. Full scale project economic analysis will be completed during project appraisal.

2. Financial.

Financial Analysis. Financial mechanisms for ensuring the long-term sustainability of project benefits will be addressed during project appraisal. Financial rate of return (FRR) will be calculated based on the incremental cash flow of farm households. The emphasis is on identification of the mix of technical packages and investment activities which would generate sufficient long-term cash flow to finance working capital (seasonal inputs) and replacement investments into physical assets and natural resource base. The project provides grant and credit financing to local communities to improve the management of their resource base who in return, are expected to give up/ change their currently destructive natural resources use practices.

Fiscal Impacts. Distribution effects, such as the net impact of the proposed project on beneficiaries and on the national and county budgets would also be evaluated. Budgetary costs at the national levels would occur since a substantial share of the project costs will be born at this level. However, some of the project investments have a neutral long-term fiscal effect, since they essentially replace the public investments into basic rural infrastructure. For example, investments into small-scale tertiary irrigation structures would reduce the operating and maintenance costs of secondary (and possible primary) irrigation in systems in some areas which are currently financed from public funds. Rehabilitation of rural roads would free budget resources allocated for these purposes. By establishing financially self-sustainable resource management associations the project is expected to have a positive fiscal impact on national budget through cost savings from subsidy and transfer payments. Positive fiscal impact is also expected from improved payment of land taxes and 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.

3. Technical

The technical issues under the proposed project will vary among the components. The technical features of the production components of the project will be based on successful experience in these aspects in other projects in Armenia. Specific technology or technical packages used in the project are simple and already well known and established in the country or in the region. In general, the technical aspects of the project would focus on long term productivity improvements and improvement of communal natural resources base, and implementation of risk reduction and risk avoidance measures from environmental and economic/market factors. The key technical measures would comprise: (i) establishment of Village Resource Management Associations based on existing and new forms of collective action; (ii) promotion of improved natural resources management techniques based on watershed management plans; (iii) reduce production related risks and maximize cash returns to farmers. A crucial technical issue is the sequencing of activities. This implies that location-by location piloting and demonstrations may be necessary and analysis will have to assume a cumulative adoption pattern linked to watershed implementation plans; and steps needed may be different in different places.

A further difficulty might arise due to coordination problems between different activities and government agencies in order to implement the integrated approach to the various activities at the watershed level. Issues arising in these areas will be addressed during project preparation and implementation, mainly with capacity building and institutional strengthening activities.

4. Institutional

The relevant government agencies currently have limited planning and implementation capacity. Models will be developed for local community participation in natural resources management. The main executing agencies would be MONP in close coordination with MOA and Ministry of Social Welfare. Ministry of Territorial Administration will be involved in the framework of the PMB.

5. Social

The majority of project beneficiaries are poor. A Quantitative Social Assessment (QSA) conducted in 10 villages (300 households) in the project area in November 2000 suggests[2] the incidence of poverty in the project area is much higher than the national average for rural households. Analysis of the QSA indicates that between 65 and 72 percent of households in these villages live below the current expenditure poverty line (inflated to 12,339 ADR per capita per month). Rapid rural appraisal (RRA) undertaken in eight watersheds provide a comprehensive socioeconomic picture of the 19 communities and analysis of the types of problems specific to project sites. The RRA were used to identify and test criteria for targeting beneficiaries, meeting their expectations and design project poverty alleviation strategy. Project activities will be targeted to: (i) specific communities within micro-catchments defined by their agro-ecological as well as socio-economic conditions; and (ii) beneficiary groups defined by their socio-economic and productive characteristics.

6. Environmental

a. Environmental issues: The project is anticipated to generate positive environmental impacts which are: (i) sustainable management of soil, pastures and forest resources; (ii) improved ecosystem services from watershed protection; (iii) protection of critical ecosystems and globally endangered and endemic species they support; and (iv) enhanced management of protected areas through public-private partnerships. Environmental screening for small-scale village infrastructure and road rehabilitation works will be carried out according to 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.

In order to mitigate the possible risk for a negative environmental effect on the grasslands, the project will not finance increased livestock numbers. Training and extension through demonstration activities becomes a vital component to mitigate this risk along with work with communities to develop improved stocking rate guidelines and to work to balance livestock numbers with available forage.

The forage development (artificial pastures) under the proposed project would primarily consist of perennial legumes (alfalfa) and annual legumes (vetches) and annual forages. Organic fertilizer in the form of manure will be applied to these fields, and there would be little or no use

[2] 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.

of chemical fertilizers, pesticides or herbicides. The proposed project would also promote the testing and evaluation of a wide range of forage cultivars and varieties, including native species, to make eventual use of a wide germplasm base. The land for establishment of additional forage base comes from marginal cultivated land on the mountain slopes. The project will not convert natural grasslands into forage base.

Environmental Impact Assessment. A detailed analysis of the environmental impacts of the proposed project and alternative project designs will be carried out in the EIA, which will be prepared in parallel with project preparation. The EIA would: (a) screen the project to the most appropriate review and approval option; (b) establish a reliable environmental baseline against which to measure future change; (c) establish environmental objectives, standards and performance indicators; (d) promote avoiding or reducing impacts through early consideration of environmental impacts in planning and design; (e) identify possible environmental project sub-components; (f) identify and quantify benefits and residual impacts or risks (i.e. those that cannot be avoided or mitigated); (g) design environmental monitoring and mitigation plan with a schedule and triggers for action; (h) consult with and inform involved communities and convey information to senior decision-makers; and (i) provide guidance to more detailed planning and implementation.

Environmental Management (Monitoring and Mitigation) Plan. Besides assessing the environmental impact of alternative project design elements, the EIA will develop an Environmental Management Plan (EMP) focusing on three generic areas: (i) recommendation of feasible and cost-effective measures to prevent or reduce significant negative environmental impacts to acceptable levels, including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures; (ii) identification of the needs of institutions to implement environmental assessment recommendations, including staffing, authority and capability, organization and management, and knowledge and experience on environmental issues; and (iii) preparation of detailed arrangements for the monitoring of implementing mitigating measures and the impacts of the project during construction and operation.

b. Environmental category: [ ] A [x] B [ ] C

7. Participatory Approach:

The project concept and design has been developed in a participatory manner. Rapid rural appraisals (RRA) and a qualitative social assessment were undertaken in order to characterize the population and their dependence on natural resources. These data were then used to develop a menu of potential project interventions. Then community meetings were held where project objectives were explained and the menu of interventions was presented. With the help of facilitators community members were encourage to identify the overlap between their priorities and the menu project interventions. This information was then used to develop a watershed management plan, which forms the basis of the project design.

After appraisal is complete, a participation specialist engaged by the PIU will return to the communities to begin the process of organizing user groups around the menu of project options. These user groups will then participate in a planning exercise to agree on the implementation of specific options identified in their watershed management plans. These groups will be organized at both the community level and at the watershed level. The purpose of watershed level organizations will be to address larger issues that affect multiple communities but do not necessarily fall within any of their boundaries. Once the project is effective, the participation specialist will continue to work with communities at all level on adapting and fine-tuning their existing watershed management plans as well as developing new plans with communities in new

watersheds.

a. Primary beneficiaries and other affected groups:

b. Other key stakeholders: These include international and local NGOs (Green Unions , others to be added), academic institutions (National Academy of Sciences and universities), local /marz and village government, private sector (e.g. agro-processing enterprises, wood processing enterprises, nature tourism operators, etc), local communities, and external donors.

F: Sustainability and Risks

1. Sustainability:

The basis for the sustainability of project activities should be improvement of natural resources base at the watershed level and investments into human and institutional capacity, complemented by the investments into productive rural infrastructure. Profitability requires that the project activities focus on productive investments where the incremental increase of crop yields (productivity) would be highest (i.e. irrigation, access roads, etc.). Sustainability requires that farmers continue to maintain their rural infrastructure, improve land and pasture resources and maintain soil fertility. This means good management of natural resources (i.e. water, soil, forest). It also requires that farmers adjust their production systems in a way that maximizes their profits, assuming that they have good information about the markets.

Project interventions will increase both per hectare productivity and value of production in the watershed and at the household level. Furthermore, the project will lead to greater stability by reducing variability in agricultural production (e.g., yields on irrigated land show less variability in the face of weather fluctuations than do rain-fed crop yields) and in income (household economic activities diversify under the project, which should have an income smoothing affect). Resilience to extreme shocks (severe drought and market price fluctuations) will increase in a number of ways. For example, communities will plant trees and protect them by closing areas to grazing and raise tree survival rates. This will increase the vegetative cover in the watersheds and make it more resistant to extreme drought, which in turn will reduce erosion. Households will increase their resistance to extreme shock by higher grain production and by becoming involved in public works provided by the project, that provide them direct cash income. The following issues need to be addressed to ensure sustainability of project outcomes:

Extension services and training. There is a great need for extension services, demonstration, and training for project farmers as many of them have not been involved in commercial agricultural production. Current agricultural production systems are focused on subsistence survival rather than generating wealth in rural areas. Under proposed project approach extension services and training will play a key role in inducing and facilitating the farmers' shift towards more profitable and sustainable farming practices. The project extension activities include training for technicians and farmers, and establishment of on-farm demonstration activities. It came across several times during the discussions with the farmers that the demonstration activities seem to be the most effective way of disseminating information and knowledge about production technologies to farmers. The preparation process verified that there is an acute need

among the farmers for advice in the crop cultivation and livestock production techniques, selection of seeds and marketing of agro-products.

Providing farmers with extension services and training will help them build confidence as they become more skilled in farming practices. Encouraging formation of resource user associations would reduce the pressures on common resources through peer pressure and better management, while helping farmers at the same time to reduce the cost of purchased production inputs and gain access to markets

The project will build on existing capacity in the country to provide farmers extension services and training by using Regional Agricultural Extension Services. Besides there are several donor institutions and NGOs in Armenia which are currently involved in small scale farmers training and extension support, and community development in general. The project would create incentives for extension agents to make the whole process more demand driven. Various mechanisms will be used to empower and enhance farmers roles in demanding extension services. These will include voucher system, collective bargaining, contracting arrangements, etc. The project approach would facilitate the performance based contracts between project farmers and user groups, where extension agents earn commissions based on the demand for their services.

Market information. There is a keen need for better market information services among farmers. The project would increase farmer's livelihoods through generating marketable surplus, which can be then sold for cash. Building up farmers cash reserves is critical for the sustainability of the project as it allows them to invest into better land and pasture management techniques and inputs. The key impediments for market access in remote villages would include:

- *Limited production outputs*.
- *Farmer awareness and market information*
- *Competition and the position of farmers.*

The project would facilitate market access activities through existing extension services and on-going donor activities, *rather than create new institutions and increase demand for market information*. Demand for market information services will start to increase as farmers start to produce marketable surplus.

The project attempts to reduce the transaction cost of access to the markets by facilitating direct contacts between private sector agro-processing industries and project farmers. The project will build on existing demand, rather than developing a demand. In this respect, the project would pursue close cooperation with existing marketing initiatives in Armenia Possible areas for complementary support to existing extension services would include training of marketing specialists, provision of market information to farmers and financing of market studies and applied market research/studies, facilitation of contacts between project farmers and agro-processing industries, such as creation of production base for specialty products (i.e. enrichment planting of wild berries, traditional herbs), meat processing (grazing pigs), cottage processing-cheese, and post-harvest handling-establishment milk collection points). Other possible activities that could be carried out would include: (a) liaison with providers of strategic marketing studies and market information system in the country; (b) training of extension workers and NGO representatives; (c) production and distribution of market-related management and demand information; (d) applied market research that will provide background and baseline information for the purposes of project design and monitoring and guide and assist project implementation.

Institutional commitment will be vital to sustainability of the project. First, the commitment of GOA to maintain the conditionality and management standards established under the project. Second, the development of effective mechanisms for local community participation in natural resources management and conservation. Third, the establishment of transparent communication mechanisms among relevant sectoral ministries.

Social sustainability: It is important that communities see clear and explicit linkages between the development and employment opportunities they receive, and conservation of natural resources, to ensure their continued support to sustainable management of natural resources.

Financial/economic sustainability is a key for continued sustainable management of natural resources. The project provides grant and credit financing to local communities to improve the management of their resource base who in return, are expected to give up/ change their currently destructive natural resources use practices. To ensure the sustainability of project investments the tradeoffs will be negotiated with participating communities on the contractual basis between the productive resource use activities that generate short-term direct economic/financial benefits (i.e. poverty reduction) and forest and watershed resource management, which generates long-term public/private benefits (i.e. biodiversity conservation and watershed management). Annex 6 provides the possible list of incentive mechanisms to local communities which are expected to tie together their perception of possible quick and direct benefits and sustainable benefits from the project.

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

Risk	Risk Rating	Risk Mitigation Measure
From Outputs to Objective		
Impacts of subprojects on incomes and non-cash benefits is lower than estimated	M	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.
Weak local institutions to provide adequate technical assistance	M	Training will be provided to local institutions and NGOs
Local communities do not understand benefits of sustainable use of natural resources or have insufficient interest to participate in project activities	M	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.
Pilot projects are not replicated countrywide	M	The project will disseminate results of projects Project Communication Strategy developed and implemented
From Components to Outputs		
Failure of local communities to organize themselves	M	Ensure that some preparatory work is done (i.e., intensive consultation with communities, development of micro-catchment development plans and agreements reached) before project effectiveness.

Delays in project implementation as a result of the limited capacity of the PIU	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
Inadequate Government co-financing of project activities	S	Macroeconomic stabilization and revived economic growth are expected to continue
Parliament will delay ratification of the loan	S	Carry out policy dialogue by the MONP in close consultation with top decision-makers
Market incapacity to absorb additional production of staples and other products resulting from crop inputs.	S	Limit grant component of input supplies to needs for subsistence production and establish effective market intelligence service through MOA extension staff and ADP.
	M	
MOA Extension Staff do not have the capacity to service NRMPR Project participants.	M	Make provision for support to MOA Extension Staff in budget. Involve MOA staff during preparation and subsequent phases of project cycle.
Lack of entrepreneurial skills and market networks to succeed with SME development.	M	Require rigorous business plan to be appraised by PIU before approving micro-credit and active support from MOA staff – especially with market networks.
Lack of governance and improper use of project funds.	S	Establish accounting standards to be maintained by the PIU and implementation assistance consultant, and devolve management of implementation to beneficiaries where peer group pressure can reduce risk of corruption.
Overall Risk Rating	M	

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

3. Possible Controversial Aspects:

- Potential increase of livestock numbers in response to improved grazing resources. This would be mitigated by establishing a contractual agreements between beneficiaries, grazing associations and PIU to limit livestock numbers to sustainable carrying capacity;

- Potential increase of soil erosion as a result of crop inputs causing unsustainable cultivation of crops. This would be mitigated through establishing contractual agreements between beneficiaries, cropping associations and PIU to ensure that cultivation is sustainable and crop rotations with forage legumes are re-introduced.

4. Issues of special concern.

Institutional capacity. An institutional capacity assessment identified the need to improve leadership of environmental agencies and to undertake major effort to improve institutional coordination and collaboration for sustainable natural resources management. Adoption of policy and management approaches by relevant environmental authorities that bring together social and environmental dimensions of sustainability needs to find a place in the Government's strategic priorities. It is critical that Ministerial staff who work on environment/ natural resources

management do not remain in isolation but communicate closely with the Government PRSP team. Broadly the project must focus on institutional capacity building at central level supporting revisions of relevant legislation, institutions, i.e. enabling framework, public awareness building, training and other forms of support to institutional reforms.

Local institutions and implementation capacity. Technical and implementation capacity at the community level is limited, albeit the few community development projects implemented in the project area. For the successful start of project implementation, it is therefore crucial that the PMT design packages for provision of technical assistance which include incentive structures conditioning flow of investment resources to requirements for acquiring technical capacity. Market and policy failures have created an environment that encourages village communities to over-graze natural pastures, unsustainably harvest natural forests, and degrade arable land and water resources. Recent Bank projects in Europe and Central Asia have demonstrated the contribution that local institutional arrangements can make to biodiversity conservation and land rehabilitation.

Status of resource base. Arable land is limited. The country is mountainous, with only 28 percent of land below 1500 meters altitude. Topography and climatic conditions, soil fertility and the access to irrigation water vary greatly and affect yields. A large number of farmers cultivate land which is on steep slopes and highly eroded and may have been suited for animal grazing and/or forestry. Much of the cropped land is poorly cultivated inhibiting crop growth and harvesting. With inadequate use of fertilizer over a decade, soil erosion (many trees were felled in 1993-1994 for fuel to cope with energy shortages), degradation of pastures, yield potential is undermined. Water charges are still partially subsidized by the government.

The present state of resources calls for timely interventions to avoid irreversible damages. Grazing land degradation typically occurs in three steps: (1) overgrazing, (2) nutrient mining and (3) erosion and collapse. Most pastures in Tavoush are in the second stage of degradation – meaning that they can be restored relatively cheaply now with the project, or continue to degrade and soon collapse without the project. Study tours or videos of collapsing grazing resources from neighbouring countries (especially Turkey and Iran) might help convince local communities that their grazing resources are at great risk and that participation in the project is an important opportunity. Damages from over-grazing and severe over-logging from (illegal) cuttings mainly for fuel wood have resulted in land erosion, losses of soil and reduction of productive capacity. Relative extensive areas of mature and over-mature slowly decaying broad-leaved forests is located in partly inaccessible mountain areas. The estimated losses of non captured revenues are at least 2 million US$/year which could help finance the activities of the Armenian forest administration.

Markets and pricing. Sustainable agricultural production and income generating activities assume that markets are available. Market analysis and brokering services are included in the project to reduce the market risks identified during pre-appraisal. A critical issue for achieving sustainability is to apply an appropriate marketing and pricing system for timber and timber products. The current system is not transparent and does not result in collecting highest possible revenues for the Government and the society in general. If Hayantar could be persuaded to auction its wood or its cutting rights by means of bidding, it would not only reduce corruption but also improve the financial sustainability of Hayantar.

Public Sector Support. Low salaries of about US$ 10-20 for forest and protected areas staff is a serious problem leading to illegal logging and corruptive practices. Rent seeking behaviour is common among employees. Gradual performance based salary adjustment would cost only a fraction of the enormous losses caused by forgone revenues due to low commitment and corrupt behaviour. Project investments will need budgetary support after the end of the project. For

instance the Government will initially finance a decreasing portion of the annual operating costs during the five-year implementation period for the Biodiversity and Environment Education Center in Dilijan. The center will gradually move towards self sustaining and revenue earning business based on a Core Business Plan developed during the first year of operation. Investment support will be conditioned to implementation of the business plan. For other such investments, such as forestation on state land the state contribution will cover both cost of initial establishment and the subsequent maintenance cost. That should not be a problem, if the fiscal revenues from Hayantar operations gradually increase during the project life and afterwards.

Governance. Addressing corruption is an important requirement and a critical concern for achieving sustainable and long lasting impacts of the project. Corruption in the sector is clearly rooted in a complex web of direct and underlying causes. Especially at the lower level of the hierarchy of forestry staff, corruption is seen as justified to meet minimum needs of livelihoods. Quick fixes of corruption are not possible. Instead, it needs political will to initiate a process for applying measures for stricter law enforcement, adoption of efficient monitoring system which allows public involvement; transparent and accountable administration, clear allocation of responsibilities, and access to information.

G: Main Loan Conditions (TBD)

1. Conditions for Negotiations:
2. Dated Covenants:
3. Other [classify according to covenant types used in the Legal Agreements.]:

- H. Readiness for Implementation

[ ] The engineering design documents for the first year's activities are complete and ready for the start of project implementation. [x] Not applicable.
[ ] The procurement documents for the first year's activities are complete and ready for the start of project implementation.
[ ] The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.
[ ] The following items are lacking and are discussed under loan conditions (Section G):

I. Compliance with Bank Policies

[x] This project complies with all applicable Bank policies.
[ ] [The following exceptions to Bank policies are recommended for approval: . The project complies with all other applicable Bank policies.]

[signature]
Task Team Leader/Task Manager: Adriana Damianova

[signature]
Sector Manager/Director: Marjory-Ann Bromhead, Sector Manager

[signature]
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Annex 1
Armenia Natural Resources Management and Poverty Reduction Project
Project Design Summary Logical Framework

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
CAS- Related Goal: Environmentally sustainable growth through improved management of mountain ecosystems.	**Sector Indictors:** Resource based economic growth in participating rural communities/villages attributable to the project;	Sector/ country reports Economic, Social and Sectoral country reports Ministry of Social Welfare (MOSW) household survey data and poverty head count State statistics	Continued economic and political stability and growth. Return to average climatic conditions.
Project Development Objective: Alleviate poverty and promote sustainable natural resource management practices in degraded hilly and mountainous areas of Northern Armenia. **GEF Operational Program Objective**: Protect and enhance the unique mountain, forest, and grassland ecosystems and habitats which host regionally and globally important biodiversity end endemism in Southern Caucasus	**Outcome/Impact indictors:** Crop and livestock productivity in project area increased relative to trend sin non-project village Increased indigenous plant cover and biodiversity richness greater in forest and rangelands treated under the project; Expansion of forested areas [x Ha]; Trends in rate of illegal logging; Implementation of landscape-level watershed plans linking protected areas and critical ecosystems; Effectively managed protected areas in the project area; Stabilization of key threatened ecosystems and critical habitats in the project area	Project progress reports Perception survey of village participants verified by biological surveys State statistical annals, Project Progress Reports, Supervision Reports MOSW household survey data Hayantar records; Official reports registering illegal logging Study on illegal forestry, forest surveys and project reports Biodiversity monitoring reports. Independent monitoring of project implementation progress	Key stakeholders will consent to new management approaches. Pace of legal reforms sustained. Community needs in correspondence with government interests. Communities subscribe to project objectives and willing to participate in monitoring and evaluation surveys. Local communities honor their commitment to implement all project activities identified in tradeoff matrix. Commitment of local stakeholders to global biodiversity conservation objectives.
Outputs /activities from components: **A. Watershed Management and Increased Productivity of Resources** (1) community based micro-catchment plans implemented, including: • establishment of multipurpose trees agro-forestry on field boundaries and forest margins; • stabilization and rehabilitation of active gullies; • rehabilitation of hay meadows; • sustainable management of high pastures; • adoption of improved agricultural practices;	Community level annual programs developed and funded [number]; Reduced soil degradation and return to fertility of badly eroded plots; Demonstration projects for sustainable pasture and meadow management systems carried out in [ ] % of project communities;	Project progress reports Land monitoring surveys Socio-economic survey, project reports and reports from nurseries and Extension and Monitoring Unit Forest management plans	Appropriate enabling environment is created to allow community forest management Staff & workforce available & trained Decentralization leads to improved management of environmental and natural resources Micro-catchment plans

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Project Design Summary Logical Framework

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
• Establishment of livestock watering points in selected summer pastures. • Increased access to existing rural credit for small rural enterprises; • Rural infrastructure improvements	Number of farm visits by extension agents; [Number] of watering points established in project sites; Reintroduction of forage legumes into crop rotation (area [Ha] covered); [Number] of small farm enterprises established in participating communities; Field roads rehabilitation completed in [ ] % of project communities, alternatively [km]; [Number] of minimum wage labor days per community participating in workfare programs Area [Ha] hay meadows covered under rehabilitation program	Evaluate against international forest certification standards Quarterly monitoring reports Quarterly progress reports Annual evaluation reports Annual audited project accounts Bank mission review reports Mid-term review reports	completed and resources allocated for implementation, & these resources are used effectively and efficiently Local communities honor their commitment to implement all project activities identified in trade-off matrix.
(2) Community capacity for sustainable use of common resources enhanced	Increased awareness of forest conservation needs [number]of project communities involved in reforestation and enrichment planting;	Baseline surveys, annual surveys	Timely availability of support services (technology, information)
(3) measures for effective protection of mountain biodiversity at watershed level effectively implemented • Improvement and rehabilitation of existing hay meadows; • Enrichment planting and sustainable harvesting of non-wood forest products; • Effective measures for preservation beech and oak forest systems	Increased community incentives to conserve forest resources . Agreements for adoption of improved forest grazing practices with [number] of participating communities;	Participatory Monitoring Reports Perception survey of village participants and MoA, MoNP staff Project Implementation Consultant quarterly progress report Participatory Monitoring Reports	General public aware of need to conserve biodiversity.
(4) Income opportunities of rural communities increased	Food security and surplus production increased [income/expenditure pattern based on consumption ”basket”]; [Number] of poor employed in workfare programs in project area; Increased cash surplus available	Interim socio-economic survey, project reports; End–of- project Social Assessment Progress reports/ PIU spot checks	Local workforce available and trained. Adequate response to workfare programs

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Project Design Summary Logical Framework

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
	for re-investment in sustainable agriculture practices [number of households].	and community sub-project implementation reports	Community commitment for funding of recurrent costs
B. Improved Forest Management			
(1) Over-grazed and/or over-logged forest stands rehabilitated with community participation	Community participation in forest grazing user groups increased [number of forest user groups];		
• Community forest and pasture management plans implemented	X areas under lease X user associations functioning.	Reports from nurseries.	
• Plantation of multipurpose bushes and trees	[Ha] new plantations in project area X seedlings distributed	Forest/pasture management plans	Appropriate enabling environment is created to allow joint forest management;
(2) Sustainable forest management practiced in selected pilot areas on state forest land.	Wood volume increment (measured on permanent sample plots) and increment/legal harvest ratio [%].	Evaluate against international forest certification standards	Commitment to fight illegal cutting /logging & combat corruption and release information;
	Sustainable forest management practices adopted in [number] forest units.	Hayantar annual reports	
	Forest management plans prepared [number/or %] in project area	Project progress reports	Appreciation of transparency.
(3) Legal, institutional and policy framework for sustainable forest management and biodiversity conservation established	Area of forests under improved management [% forest area with forest management plans and % area under pre-commercial thinning];	Legislation, by- laws Forest Management study Survey of villages	Hayantar in consent with project objective
Technical assistance for effective forest management delivered to Hayantar, Department of Protected Areas, local environmental authorities and communities	Reduction in deforestation rate; number illegal logging cases reduced ;	Reports on illegal logging activities	Communities subscribe to project objectives and willing to participate in monitoring and evaluation surveys.
	Regulation on transfers of forests to villages adopted by year [ ];	Reports on land use	
	Regulation on preparation and adoption procedures of forest management plans;		
C. Improved Management of Project Protected Areas	Regulation on planning, approval procedures and EIA in forest road construction by year;		
(1) Effective management of Dilijan Reserve and Lake Sevan Parks	Number of forest staff trained		
	Rationalize national legal and regulatory framework for protected areas and flora and fauna conservation	Laws/ regulations/GOA decrees Records of public consultations	Consensus on national biodiversity objectives
	Conversion of two paper parks into functional well managed PA;	Project progress reports	

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Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
(2) Enhanced planning and management capacity of protected areas and increased public awareness	Prepare and implement management plans for Dilijan Reserve and Lake Sevan park Bio and landscape monitoring system (GIS) established in the two parks. Adequate staffing of Dilijan and Sevan park administration Park rangers services established and training delivered [number];	Protected areas laws and regulations Project progress reports Field surveys	
(3) Community small grants program for local biodiversity conservation initiatives implemented	Biodiversity conservation measures undertaken in participating communities [number of grants]		Quality proposals for grant funding
(4) Establish/rehabilitate basic infrastructure and visitors facilities in Dilijan and Lake Sevan Park	Park infrastructure rehabilitated (details to measure);		
C. Efficient Project Management • Provide support to project administration and in the implementation of project activities • Provide support in the areas of financial management training, project audit, capacity building etc	Number of Micro-catchment plans prepared and agreed ; Contracts with local society groups (NGOs) for implementation services signed; Organizational and functional structure established prior to project effectiveness; Operational manual approved; PIU Office secured and Equipment procured; PIU Staffing completed by effectiveness ; FM and project management system at place; Staff training provided. Annual budget counterpart allocations transferred to Project Account. Materials Expenditure TA	PIU Progress reports, including disbursements and procurement reports. Project progress and supervision reports Project Audits Project account disbursement reports	PIU records are maintained transparently Project staff are competent and dedicated. Sufficient counterpart funds available through project life Selection of project sites according to agreed criteria

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Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
Project Components: **A. Participatory Watershed Management.** **B. Forest Management** **C. Protected Areas Management** **D. Project Management**	**Inputs (budget for each component) as per project document**		

Annex 2
Armenia Natural Resources Management and Poverty Reduction Project
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$ 5.0 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 mlokosiwiczi*). 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 Geghakunik marzas 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 Geghakunik Marzas 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 Geghakunik Marzas). 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 **SIDA** and **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. **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 Geghakunik Marzas 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 Marzas 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$ 10 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$ 15.4 million,** and consists of: (a) integrated watershed management: **US$ 7.4 million**; (b) sustainable forest management: **US$ 7.3 million**; and (c) on-site management of priority protected areas: **US$ 0.8 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.

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Incremental Cost Analysis and Global Environmental Benefits

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 marzas 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$ 20.4 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$ 8.4 million (GEF financing - US$ 1.0 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 aforestation activities in the context of an integrated watershed management planning, which includes rehabilitation of critical forest habitats through involvement of local communities -- **US$ 7.7 million** (GEF financing **- US$ 0.4 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$ 4.3 million** (GEF Financing – **US$ 3.5 million**).

Incremental Costs

The project's incremental cost is **US$ 5.0 million**, - the difference between the Baseline Scenario (**US$ 15.4 million)** and the GEF Alternative (**US$ 20.4 million)**. Of this, the GEF is requested to fund **US$ 5 million.** The details of the Baseline and the GEF Alternative are presented in the attached Incremental Cost Matrix.

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Incremental Cost Matrix

Component Sector	Cost Category	US$ Million	Domestic Benefits	Global Benefits
Participatory Watershed Management	Baseline	7.4	▪ Meaningful participation of local stakeholders for sustainable management of natural resources; ▪ Improved crop yields and livestock productivity and resilience against natural disasters; ▪ Protection of watershed functions and flow of environmental services; ▪ Increased opportunities for alternative income generation;	▪ Reduced sedimentation of downstream waters (some of which may be international) due to soil stabilization ▪ Limited conservation of globally significant biodiversity;
	With GEF Alternative	8.4	▪ Same as above; ▪ More sustainable benefit flows from crop and livestock production; ▪ Enhanced Government and non-government capacity to manage natural resources in an integrated participatory manner;	▪ Improved protection and management of globally significant biodiversity; ▪ Improved flow of environmental benefits (i.e. carbon sequestration, reduced sedimentation of international waters, i.e. Araks river); ▪ Improved public environmental awareness;
	Increment	1.0		
Forest Management	Baseline	7.2	▪ Improved forest sector policies; ▪ Increased opportunities for alternative income generation. ▪ Maintained flow environmental services;	▪ Limited conservation of globally significant biodiversity, mostly in remote forest habitats; ▪ Less destructive logging helps to conserve biodiversity in production forests; ▪ Maintained flow of global environmental services (i.e. carbon sequestration);
	With GEF Alternative	7.7	▪ Same as above, plus ▪ Improved planning for the sustainability of production forests; ▪ More sustainable benefits flows form forest harvests;	▪ Mainstreaming of biodiversity conservation objectives into forest sector policies; ▪ Enhanced conservation of biodiversity through better management of critical forest habitats; ▪ Increased flow of global environmental services (i.e. carbon sequestration) through reforestation activities;

	Increment	0.4		
In-site Protected Areas Management	Baseline	0.8	▪ Maintained flow environmental services;	▪ Limited conservation of globally significant biodiversity in protected areas; ▪ Maintained flow of global environmental services (i.e. carbon sequestration);
	With GEF Alternative	4.3	▪ Participation of local stakeholder groups in PA management; ▪ Increased institutional capacity of MoNP to manage PAs; ▪ Increased revenues from eco-tourism; ▪ Increased opportunities for alternative income generation based on sustainable utilization of biodiversity in buffer zones and protected areas.	▪ Improved protection and management of globally significant sites and biodiversity; ▪ Increased public awareness of issues related to biodiversity conservation and participatory schemes for sustainable management of natural resources; ▪ Improved monitoring and information of endemic flora and fauna and key habitats;
	Increment	3.5		
Totals	Baseline	15.4		
	With GEF Alternative	20.4		
	Increment	5.0		

Critique

1. Introduction and Background

Armenia is a prime sector of one of 25 "biodiversity hotspots", these being areas that feature exceptional concentrations of endemic plant species and that face exceptional threats of habitat destruction. Within its original expanse of ca. 500,000 square kilometers, now reduced to ca. 50,000 square kilometers of primary vegetation, this Caucasus hotspot harbors 6300 plant species, of which 1600 are endemic, together with 632 vertebrate species except fish, of which 59 are endemic. For comparison, the British Isles cover 230,000 square kilometers, eight times larger than Armenia's 29,000 square kilometers, and harbor only one fifth as many plant species, 1150, of which just one is endemic (Myers et al., 2000).

The Armenia sector comprises only 6 percent of this hotspot, but it contains 3555 plant species, 56 percent of the hotspot's total, with 108 endemics, 7 percent, a number of them of special global importance (as demonstrated on page 5 of the Project Document, and in light of their role as flagship species). I assume that the great majority of these species occur in forests and woodlands (which now cover only one tenth of national territory), though the Document does not spell this out in any detail. Many endemics appear in higher-elevation forests, notably montane and cloud forests, and above the tree line, especially in limestone areas. Significantly, well over half of arable land occurs below 1500 meters. Notably significant are xerophytic plants. The Document does not specify what proportion of the country's biodiversity is confined to the northern areas targeted by the proposed Project. (The above is based on Davis et al., 1995; Groombridge and Jenkins, 2000; McNeely et al., 1994; Ministry of Nature Protection, Government of Armenia, 1999.)

Armenia is far from developed. Its per-capita GNP/PPP in 1999 was only $2210, less than half the average for 18 countries of Central Asia. Fortunately the economy has grown during 1995-2001 by an annual average of 5.6 percent, and is expected to show 6.0 percent for 2002 (International Monetary Fund, 2001; World Bank, 2001). Nonetheless, over half the population can be classified as poor. At least 70 percent of farmers, who make up only one third of the population (a share that is half the share for the region) live at subsistence level.

Within the country's 29,000 square kilometers there are fewer than four million people, a total that is increasing by just 0.3 percent per year, the next to lowest rate of the region's countries (the total fertility rate, roughly the same as family size, is lowest at 1.1 children). The population is projected to top four million until close to 2025. All this means that population pressures are hardly a factor except when allied to poverty. On the positive side, life expectancy is 73 years, among the highest in the region, and infant mortality is 16 per 1000 live births, among the lowest (Haub and Cornelius, 2001). The country possesses 316 physicians per 100,000 people, as many as in France (United Nations Development Programme, 2001). All these factors, which compare favorably with many developed countries, suggest that, despite Armenia's impoverished status overall, it is well placed as concerns primary health care.

The Project Document asserts on page 6 that conservation of biodiversity is best achieved through relief of rural poverty, and conversely that conservation will serve to relieve rural

poverty. While this is sound conceptually, it is often difficult to demonstrate in practice (as the Bank well knows). The Document should cite, right up front, some examples to illustrate the many linkages at work in both directions.

The Project emphasis on the involvement of all stakeholders is specially helpful as an organizational principle. Again, up-front examples from past on-ground experience would serve to drive home this pivotal point.

2. Major Points

Specific sector issues (pages 10-14)

This presents the detailed rationale for the project. Listed are: degradation of agricultural lands, depletion of forests and fisheries, protected area management and biodiversity, institutional capacity, rural poverty, and natural resource/poverty linkages. This list covers most of the issues one would expect to see tackled. It shows (pages 10-11) that e.g. soil erosion from deforestation and poor agricultural practices affects a huge share, 60 percent, of agricultural lands. But: the two sources of soil erosion are markedly different in the extent to which they cause soil erosion and their damage to agro-productivity. Hence too they require different sets of policy reforms. They should be differentiated at least qualitatively and hopefully quantitatively.

Similarly: how much of the agro-land decline is due to lack of farmers' capital to invest in improved practices, and how much is due to farmers' lack of awareness of sustainable practices. Annual fertilizer use is only 14 kilograms per hectare of cropland, by contrast with Ukraine's 26 kilograms, Bangladesh's 138 kilograms and China's 265 kilograms (World Resources Institute, 2001). The first presumably requires enhanced credit systems, the second needs expanded extension services. This implies an economic evaluation of trade-offs (insofar as there is not enough government support available to do both to optimum levels). What might be some cost-effectiveness returns through each strategy? Are time horizons comparable or quite different? Would each help similar numbers of farmers?

The plunge in livestock numbers: is this entirely a bad thing, or were the former numbers too many for pastureland carrying capacity (given prevailing technical inputs, institutional back up and the like)?

Forest cover has fallen from 25 percent to 10 percent: revealing. But what is an optimal amount?

Loss of biodiversity: how far does this loss contribute to local poverty and how much to depletion of the global heritage in species? Are the two sometimes complementary? Why is there not more documentation of wild plants' economic values, when 200 species are edible, 2000 species are used as animal fodder, 350 support honey-producing bees, 120 supply berries, 120 are aromatic, and 130 have health properties (Ministry of Nature Protection, Government of Armenia, 1999)? What share of rural subsistence stems from these sources? Are they over- or under-used? Does biodiversity offer much for nature-based tourism, how fast has it been growing, how much could it be expanded?

Agriculture employment: sounds fine that employment almost doubled within just six years. But can such a rapid rate be maintained for, say, another six years? Has the doubling conceivably lead to some over-employment? What scope is there for part-time off-farm employment, and can this be expanded?

Deforestation due to over-exploitation of fuelwood: can household energy be supplied by e.g. biogas stoves or even village-level solar panels?

Poverty alleviation through cash benefits: while it is good news that the total of families eligible has fallen from 230,000 to 190,000 (over which period?), what are the marginal costs and benefits? If the amount of cash handouts were doubled, would the fall in number be doubled as well, or would there be diminishing returns?

Most important of all, the section purports to establish concrete and specific linkages between biodiversity and poverty, especially to show how supporting one will support the other (and particularly in agriculture). If the case can be made to stand up, it would plainly make for a powerful win-win outcome: a prime and very plausible objective. But the Bank has had some difficulty in documenting the connections. While they might seem all too apparent to many observers, they do lend themselves to ready demonstration. For this crucial reason, the section will be greatly strengthened if the case can be substantiated for purposes of the project proposal. As it is, the line of analysis seems a bit "thin" to say the least.

From the policy standpoint, moreover, where are the main points of intervention? What action leverage is there? Are there any multiplier effects? What should be the priorities--soil conservation, organic agriculture, energy supplies, extension services, credit facilities, marketing networks, institutional supports, other kinds of rural infrastructure?

While I consider the project's purposes and goals are valid for the most part, the presentation thus far hardly does them justice.

The key question of tradeoffs is addressed briefly under Strategic Choices (page 15), and its rationale is recognized. All the same, a more systematic and systemic treatment would certainly help to flesh out the document. I do not wish to imply a need for a lot of detailed analysis. A few illustrative items would go far. I believe that 10 percent more time and effort on the proposal would make it 25 percent better.

Page 17: the three bullet points are specific, concrete, justified. Fine! Good too to see the table with its budgetary reckonings--gives a clearer picture of what is envisaged, sector by sector. Much the same applies to pages 18-23 on Components, about which I have no particular comments.

A general point: who or which authority is to be ultimately responsible for the project's success? While working on environment/natural resource and poverty issues in several dozen countries over the past forty years, I have found this is a crunch factor. The reason is that many of the actions needed are cross-cutting--scientifically, technically, economically, operationally and hence institutionally. This means that they run the risk of conflicting with traditional

ministerial boundaries. Who can be invested with sufficient authority, a.k.a. political clout, the make the actions actionable? Answer, probably a "czar" reporting directly to the head of government. Anything less is likely to fall short. Inter-ministerial committees do not work with sufficient impact, alas.

Project Rationale (pages 25-29)

Much good material for the most part, at least analytically. But the shortcomings listed above are prominent again. Lack of quantified tradeoffs is often a sizeable problem. Without this vital angle, the text is apt in places to read like a wish list--all highly laudable ideas, but limited prioritization.

Summary Project Analysis (pages 29-35)

Same again. Fortunately the section on timber benefits is much better--incisive, organized and substantiated. The bit about CO sinks, last sentence: can't some of the timber biomass be sequestered in the form of construction timber? Items 3 and 4 on Technical and Institutional matters are distinctly thin by comparison. For instance, what is the "simple technology"? By contrast, the tables on pages 33 and 34 are helpful. The section on stakeholders, page 35, needs to be beefed up. Stakeholders can make or break a project.

Sustainability and Risks (pages 35-40)

A mixed picture. Some are fine, some are less so. The time horizons deserve more treatment, especially since the time preference rates of poor farmers, subject as they are too to objective risks such as adverse weather, tend to be foreshortened to say the least.

3. The Annexes

These appear to contain much sound analysis and exposition. Regrettably it is difficult to follow their logical sequence, especially insofar as the headings do not conform to those in the two Contents sheets. This lacuna should be addressed forthwith, and would do a good deal to make the proposal more readable.

The budget envisaged seems reasonable given the diverse values, both human and natural, at issue here. In fact I consider the Bank/GEF would be getting a better return per dollar invested than in certain other countries whose project proposals I have reviewed.

4. Minor Points

Page 5, para. 3, line 7: arable land could hardly have declined by 27 percent in a single year. Extrapolated, it means that virtually the whole expanse would disappear within three years.

Page 5, line 9: the produce of orchards and vineyards is surely marketed.

5. Summary Assessment

On the basis of the several dozen STAP reviews I have undertaken over the years (mostly for UNDP), I find this project proposal is quite mixed in content, treatment, documentation,

analysis and evaluation. Some parts are fine, others are okay-ish, others warrant more work. Given what is at stake in Armenia, whether from local, national or global standpoints, the project should be approved provided that several lacunae can be plugged, several sections are given more detailed and quantified attention, and others are fine tuned. Several sections are acceptable as they are.

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September 25 2001 Professor Norman Myers

Annex 3.1
Armenia Natural Resources Management and Poverty Reduction Project
Response to STAP Technical Review

Dear Prof. Myers,

Thank you for the very comprehensive and detailed review, which greatly helped the team to improve the presentation of the project proposal and strengthen the focus on specific issues, as identified in your note dated September 25, 2001. I am glad to see that you praise the project proposal by acknowledging the validity of its purpose and goals and that you recommend to GEF SEC to approve the proposed project. Document presentational issues raised in your note are being taken care of prior to submission of the final document to GEF SEC, while those requiring verification of data/ update on figures, and deeper analysis, will be the teams' primary task during project appraisal along with issues which we consider of equal importance such as the detailed economic analysis, cost estimates and verification of project implementation arrangements.

Let me provide some details in response to the issues in your note:

(i) According to the rapid rural assessment and assessment of the rural credit system in Armenia (and confirmed by the conclusions of the Qualitative Social Assessment) despite the wide supply of farm credit -- theoretically available to farmers -- the demand is still very narrow, partly due to physical constrains, and mainly to the lack of capacity in newly established ag-extension services to meet farmer's needs for technical and business development guidance and support. The project aims to address this issue at the level of two project marzes. Other Bank projects such as the Agriculture Development Support Project, and the Bank policy advice on the financial and banking sector issues aim to tackle the systemic issues and strengthening the credit institutions.

(ii) The linkages between biodiversity loss and impact from deteriorating social conditions will be studied in more depth, to strengthen this part of the analysis, despite the lack of wide practical experience. Data from the SA and Quantitative Social Survey provides evidence of behavioral patterns, and limited empirical figures, to what extent in time of hardship rural poor increase the use of NTFP or other biological resources with economic value. Loss of forest cover is similar, albeit the stronger impact of economic, institutional and governance issues which are prevailing. Again the QSA provides an evidence for that.

(iii) Institutional commitment to project success. Notwithstanding the strong commitment of the Government to project objective, another round of discussions will be held with the main stakeholders on institutional responsibilities for project success. I cannot agree more than that commitment to success of the project is a key issue, more so in the case of Armenia where an ongoing concern during the last couple of year was not only the implementation capacity at all levels, but the significant financial constraints to provide adequate counterpart funding. Project financing requires Government' s commitments to allocate counterpart budget resources in the required amount and in a timely manner-- another factor to the timely implementation and success of the project.

(iv) Project cash payment v/s social protection benefits. The primary purpose of the cash payments for public works (i.e. forest planting; enrichment planting; construction of pasture watering points; reseeding of alpine meadows with native grass species; rehabilitation of access roads; etc.) is to give farmers an opportunity to earn additional cash which they can then use to finance seasonal inputs for agricultural production activities (i.e. working capital). This is in lieu of setting up micro-credit mechanisms which was not deemed feasible under the project, given the high administrative and institutional costs of setting up such a scheme. Direct poverty reduction impact of these cash payments is deemed as a secondary goal. For most beneficiaries it may be only a one time income source. However, it is expected that cash payments may have indirect medium-term poverty reduction impact IF the purchase of seasonal agricultural inputs will be linked with more sustainable production practices. In order to facilitate this change the project will provide farmers training and extension advice services and set up demonstration sites, where more sustainable (both financially and environmentally) technical packages and agricultural production approaches will be implemented.

(v) Forest cover decrease. What is an optimal amount? The so called "optimum" amount of the forests depends on many factors, most of which are out of control of this project. This may include, among others, opportunity cost of other forms of land uses (mainly agriculture and grazing); social and private discount rates; cost of alternative energy sources; as well as economic value of on-site and downstream environmental benefits provided by the forests which affect directly or indirectly economic productivity (i.e. increased water holding capacity soils during drought; seduced soil erosion; reduces sedimentation and siltation; reduced nutrient flows, etc.). It would also require the knowledge of national and global environmental benefits such as economic value of biodiversity benefits and carbon sequestration. Evaluation of these economic benefits is extremely difficult, since it requires understanding of critical ecosystem production functions, which may be nonlinear or discontinuous. Using existing economic analysis tools, we may be able to estimate only the conservative lower bound value of these services which is not sufficient to draw conclusions about the "optimality" of forest cover. Given these uncertainties, the project takes a conservative approach which calls for stabilization of current forest resources and promotion of sustainable harvest rates which do not exceed natural growth rates, while minimizing the risks of change in species composition.

(vi) Quote a question: "Fortunately the section on timber benefits is much better--incisive, organized and substantiated. The bit about CO sinks, last sentence: can't some of the timber biomass be sequestered in the form of construction timber? "unquote

The team will consider this suggestion in the economic analysis.

(vii) Question re. Items 3 and 4 on Technical and Institutional matters "What is the "simple technology"?

The team has addressed this issue. The document includes additional explanation about the technical and institutional feasibility of project interventions. The term "simple technology" refers to capacity (i.e. skills, knowledge, risk perception, etc) and ability (i.e. financial resources, household labor availability, existing public infrastructure, etc.) of farm household to successfully implement the suggested technical packages and generate additional income.

Again thank you for your cooperation and very informative comments.

Sincerely,

Adriana Damianova
Task Team Leader

Annex 4
Armenia Natural Resources Management and Poverty Reduction Project
Protected Areas and Biodiversity Conservation

Sites proposed for GEF interventions		
	Gegharkunik Marz including Lake Sevan National Park	**Tavush Marz including Dilijan State Reserve**
Region		
Size	4,055 sq.km, out of which Lake Sevan National Park consists 1,500 sq. km. Altitude range 2,000 to 3,500 m	2,688 sq.km, out of which Dilijan State Preserve consists 290 sq. km. Altitude range 400 to 2,800 m
Population	Total population 202 thousand (rural population 84%). Extreme poverty ranges from 30% to 70% depending on location.	Total population 92 thousand (rural population 79%). Extreme poverty ranges from 30% to 70% depending on location.
Biological Diversity	Representative ecosystems include: steppe; mountain steppe; alpine meadows; wetlands around Lake Sevan and Lake Gili. These ecosystems host 1,507 species, 494 genera and 102 families of fanerogames (flower and seed producers) reported . Preliminary inventory of rare and disappearing plant species indicates 165 plant species that belong to 45 flower families and 117 genera which need protection. 60 species of the Lake Sevan flora has been entered into the Regional Red Book. The region provides habitats for 176 species of aquatic birds, 15 species of reptiles, 9 species of fish and 40 species of mammals. Some of the highly endangered species include wild goat which can be found only in Lake Sevan National Park. The region hosts 76 varieties of trees and bushes. The endangered habitats include forests of *Juniperus* located on the dry slopes of the Lake Sevan plateau. Lake Sevan National Park is a wide management area which incorporates core protection zone around the watershed basin of Lake Sevan including strict conservation zones with a status of reserve and state reservations under conservation and sustainable use regime. Lake Sevan National Park harbors a unique alpine-lake ecosystem and its littoral habitats. Lake Gilli and its surrounding wetlands are located in the south eastern	Representative ecosystems include: broadleaf forests, mountain steppe; subalpine and alpine meadows. Forest habitats found in the region support a high diversity of plants and animals, with the density of up to 100 spp higher plants per sq.km. Rare tertiary relicts include species such as rosebay and hazelnut. High alpine meadows are a sources of genetic resource of wild wheat, rye, barley, aegilops species and various native grasses. Animals of particular biodiversity significance in the forested area of Tavoush include snow leopard (*Panthera pardus*), white tailed eagle (*Haliaetus albicilla*) and falcon (*Falco peregrinus*). Globally threatened vertebrates include mouflon (*Ovis orientalis gmelinii*), wild goat (*Capra aegagrus*); marbles polecat (*Vormela peregusna*); European otter (*Lutra Lutra*); brown bear (*Ursus arctos*); and *Corylus colurna*. Dilijan state reserve is a strictly regulated conservation area corresponding to IUCN category Ia (IUCN 1994) protected area. Dilijan reserve was established to ensure the highest degree of protection to important habitats and species. The Dilijan Reserve preserves rare tree species and forest fauna that is dependant on broad-leaved forests - old grown oak 43% of the area; 36% beech (*Fagus orintalis*); and walnut (*Juglands regia*) stands, which provide habitat for 40 tree species and 45 species of mammals including the largest grove of yew (*Taxus baccata*) in the Caucasus. Threatened insect species include *Porphyrophora hamelii* Brandt (found also in Mexico). The

Sites proposed for GEF interventions		
	banks of Lake Sevan, which is a habitat and nesting area of migrating bird species. The Park also hosts oak, beech and juniper forests (5 species) and sainfoin steppes	Reserve protects species with high medicinal and ecological value such as Mulberry (*Morrus alba*) and *Humulus lupulus*. In addition, It hosts unique historic and architectural monuments.
Current status	National Park. Area zoning comprises four reservation zones with restricted economic and recreation activities.	Reserve. Area zoning includes four zones.
Main threats	Poor enforcement and lack of resources for park management reduces the effectiveness for biodiversity conservation; Habitat loss and fragmentation due to increasing extensive exploitation of natural resources and pressures from illegal forest harvests and farming; Loss of original conditions and productivity of valuable chernozem formations (*Onobrychis*, *Hordeum*, *Stipa*) due to usustainable agricultural exploitation interventions; significant alteration of soil mechanical composition, erosion. Increasing deforestation in the Marza totaling to some 1,655 ha due to unsustainable forest management Unregulated grazing leading to depletion of flora or significant changes in the floristic composition (loss of forage species and expansion of weed and non palatable species; at least 165 plants species need protection); degradation of natural grasslands land. Illegal hunting of indigenous species in lower lands, swamps and marshes of Lake Sevan National Park.	Poor management of the Dilijan State Reserve reduces the effectiveness of the protected area for biodiversity conservation (reserve status poorly enforced, lack of resources and administration capacity and specific conservation plans). Illegal logging leading to loss of forested areas, reduced regeneration due to grazing in forest, unsustainable collection of wild plants and animal poaching; Increasing human pressure on natural resources poses continuous threat to biological resources Overgrazing and hay production in sub-alpine and alpine meadows and forested areas has resulted in loss of indigenous species Increased soil erosion leading to due to loss of tree cover and associated with threat to bird and mammal species
Key interventions	Development and effective implementation of Lake Sevan National Park management plan integrated with the regional development goals Strengthening stakeholders institutional capacity – i.e.	Development and effective implementation of Dilijan State Reserve Management plan, which will be integrated with the IDA financed forest management plans outside Dilijan boundaries. Strengthening stakeholders institutional capacity (Dilijan Reserve

Annex 4
Armenia Natural Resources Management and Poverty Reduction Project
Protected Areas and Biodiversity Conservation

Sites proposed for GEF interventions		
	Sevan Park administration; village user groups, local society groups living in the within and buffer zone of the Park. Provide support to adoption of sustainable pasture management practices on alpine meadows and mountain steppes. Reforestation on degraded slopes in order to stop soil erosion and land degradation; reforestation/re-vegetation of the shores of the Lake Sevan with the purpose of coastal zone protection and stabilization. Provide support to nature based tourism infrastructure linked to cultural landscape sites Monitoring of key endangered species in the project sites as indicators for ecosystems recovery Develop and implements small grants scheme for biodiversity projects and adoption of sustainable farming technologies	administration, MONP Protected Areas Department and Hyantar, village forest management associations). Training of staff (Hayantar and rangers service) Promotions of environmental education and public awareness Implement in -situ conservation of biological resources and enrichment planting (tree planting, enrichment planting; pasture enrichment) Monitoring of key endangered species as indicators for ecosystems regeneration. Development and implementation of small grants scheme for biodiversity projects Promotion of regional cooperation and establishment of regional ecological corridors with protected areas in Georgia and Azerbajizan.

Annex 5
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 first three State reserves Khosrov, Dilijan, 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 km2, 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.

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*), marbeled 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 loose 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 it 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 along 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. At present in the basin of Lake Sevan are 92 settlements with total of 277,600 inhabitants (1999) and population density 52 per km2. In the past the area was used mainly for fishery. 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. tesselata*). 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 (Mates 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 arboreous 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 (*Phragmytes*), 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 Tavush Marz was established as a state reserve in 1958 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 at altitude of 1000- 2300m and includes the watersheds of Agstev and Getik rivers. 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.

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.

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. szovitsanium,* 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.

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 is illogical from the socio-economic point of few, not to use rich and diverse recreational resources of Dilijan.

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 beach 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-timer 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 offences.
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.

Error! Unknown switch argument.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
1. Retain Natural Resource Base and Mountain Ecosystem Values				
1.1 Establishment of multi-purpose tree agroforestry	▪ Provide wood and tree products ▪ Demonstrate new land management practices ▪ Provide raw material for local craftsmen	▪ Conservation of forest habitats, of soils, contribute to the regulation of water resources	▪ Preserve indigenous species and habitats for flora and fauna.	▪ Appreciate the importance of trees in the environment. ▪ Adoption of recommended & demonstrated practices. ▪ Adapted species only to be planted.
1.2 Demonstration of bio-gas production systems	▪ Source of energy for cooking, lighting and heating. ▪ Provide high quality, weed & pest free fertilizer (manure) as a side product. ▪ Labor saving. ▪ Incentive for extending winter feeding of livestock.	▪ A major potential substitute for fuel wood.	▪ Reduced use of forest resource could lead to re-aforestation, soil preservation, water retention, reduced sedimentation and increased carbon sequestration.	▪ Reduction in use of animal manure as a burnt fuel source. ▪ Demonstrations required in all villages. ▪ Increased fodder production to improve livestock productivity and support sustainable increase in livestock numbers.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	**Natural resources conservation (long-term)**		
		Local (micro-watershed) scale	*Global scale*	
1.3 Stabilization & rehabilitation of gully erosion	▪ Short term employment opportunities. ▪ Long-term income generating opportunities.	▪ Stop further degradation of soil resources. ▪ Return of fertility for badly eroded plots.	▪ Reduction of watershed-scale sediment yield, and thus protection of downstream fisheries. ▪ Increase the life span of downstream water storage dams.	▪ When private lands are treated, there should be in-kind cost sharing by the owner ▪ On public lands, involvement in the gully control should be rewarded through payment for work or granting usufruct rights for 10 or more years.
1.4 Stabilization of areas at risk from land slides	▪ Short term employment opportunities. ▪ Reduce erosion of arable and grazing lands. ▪ Poplar poles used for stabilization create timber resource for future generations.	▪ Stop further degradation of soil resources. ▪ Agroforestry using poplars and willows.	▪ Reduction of watershed-scale sediment yield, and thus protection of downstream fisheries. ▪ Increase the life span of downstream water storage dams.	▪ When private lands are treated, there should be in-kind cost sharing by the owner ▪ On public lands, involvement should be rewarded through payment for work.
1.5 Rehabilitation of existing field tracks	▪ Short term employment opportunities ▪ Restore access (reduce costs?) to under-utilized fields, mountain pastures and meadows	▪ Reduce erosion ▪ Spread grazing pressure over larger areas of land ▪ Increased crop rotation due to increased area of arable land.	▪ Access to remote areas will lead to more active management and consequent improvement and preservation.	▪ Willingness of community to provide labor. ▪ More secure tenure & access rights to distant pastures, fields & meadows.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
1.6 Support to local eco-tourism	▪ Provide cash revenues for the villagers (rent horses, provide guides for tours, etc.)	▪ Increase awareness of local population of the importance of natural and cultural resources conservation by demonstrating their asset value.	▪ Increase awareness of regional and national officials of the importance of natural and cultural resources conservation ▪ Help to develop long-term programs directed to Natural Resources conservation.	▪ Landscape issues should be considered and taken into account by the watershed users forum.
2. Protection & sustainable use of mountain biodiversity				
2.1 Enrichment planting & sustainable use of non-wood forest products (berries, fruits, fungi etc)	▪ Increased food security ▪ Income generation. ▪ Increased understanding of forest conservation needs.	▪ Conserve woody species on pastures and forest boundaries (biodiversity) ▪ Establish multi purpose indigenous species in forest buffer zone.	▪ Preserve forest understorey biodiversity. ▪ Preserve indigenous species. ▪ Provide habitat for fauna and other flora.	▪ Right to collect berries & fruits linked to enrichment planting. ▪ Adoption of sustainable management practices.
2.2 Bee keeping for honey production	▪ Increase food security ▪ Income generation	▪ Essential for pollination of indigenous forage legumes, honey trees and fruit trees.	▪ Biodiversity conservation of a wide range of species.	▪ Alternative marketing needed such as selling comb honey to guarantee purity. ▪ Adoption of bee forage agroforestry and meadow packages ▪ Adoption of improved apiculture practices.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	**Natural resources conservation (long-term)**		
		Local (micro-watershed) scale	*Global scale*	
2.3 Construction of stock watering points in high summer pastures	▪ Short term employment opportunity. ▪ Allows use of wider areas for grazing. ▪ Facilitates summer migration to summer pastures. ▪ Reduces risk of water shortage for animals.	▪ Enables access to remote pastures, thus reducing pressure on pastures surrounding villages.	▪ Reduces point source pressure and exclusion areas. ▪ Maintains biodiversity with sustainable grazing pressure.	▪ Participation in village pasture users groups. ▪ Sustainable management of pasture grazing. ▪ Linked to adoption of improved pasture management and crop rotation practices.
2.4 Improvement and rehabilitation of existing hay meadows. 2.5 Sustainable management of high summer pastures 2.6 Reintroduction of forage legumes into crop rotations	▪ Surplus marketable livestock production through improved shed feeding and milk / meat yield of cattle, sheep and goats.	▪ Reduced dependence and pressure on extensive graze lands ▪ Reduce need for early spring grazing. ▪ Improved soil fertility, carrying capacity, biodiversity and soil conservation.	Improvement of meadows and high pastures through reduced grazing pressure and improved grazing management.	▪ Legal amendments to allow long-term lease tenure in pasture improvement. ▪ Participation in village pastures user group. ▪ Adoption of demonstrated improved pasture management.
2.7 Sustainable pig-beech-oak silvo-pastoral agroforestry system	▪ Increased food security ▪ Increased opportunities for cash or barter income.	▪ Necessary for beechwood regeneration.	▪ Preservation of beech and oak forest ecosystems.	▪ Participation in village pastures or forest users groups. ▪ Sustainable management of forest grazing.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
2.8 Demonstration of high-quality cured pork production systems	▪ Increased food security ▪ value added agricultural processing for cash or barter income.	▪ Helps realize non-timber forest values	▪ Increases community incentives to conserve forest resources	▪ Participation in village pastures or forest users groups. ▪ Sustainable management of forest grazing.
2.9 Demonstration & training for sustainable management of summer pastures	▪ Increased food security ▪ Increased opportunities for cash or barter income from meat & milk products.	▪ Halts decline of pasture resources and starts return to full productive potential.	▪ Halts decline of pasture biodiversity and establishes management for sustainable use.	▪ Participation in village pastures user group. ▪ Adoption of demonstrated improved pasture management
3. Sustainable agricultural practices				
3.1 Demonstration & training for sustainable production of winter wheat.	▪ Increase food security ▪ Increased opportunities for cash or barter income.	▪ Increasing the surfaces available for wheat production will allow crop rotation with legumes and thus reduce fertility losses	▪ Improved productivity will reduce pressure on marginal areas.	▪ Adoption of crop rotations including legumes into cereal/forage input packages.
3.2 Demonstration & training for sustainable production of spring barley.	▪ Improve cattle turnoff and increase duration of shed feeding to reduce pressure on village grazing lands.	▪ Delayed start of pasture grazing in the spring and thus reduce erosion and preserve biodiversity.	▪ Reduces pressure on pasture biodiversity and establishes management for sustainable use.	▪ Adoption of improved animal feeding packages.
3.3 Demonstration & training for sustainable production of food potato.	▪ Increase food security. ▪ Increased opportunities for cash or barter income. ▪ Provide animal fodder.	▪ Increasing the surfaces available for potato production will allow crop rotation with legumes and cereals.	▪ Increased productivity will reduce pressure on marginal areas.	▪ Adoption of crop rotation as a prerequisite to sustain soil fertility

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
3.4 Demonstration & training for sustainable production of seed potato.	▪ Reduce dependence on externally procured, often low-quality seed ▪ Income generation.	▪ Increasing the surfaces available for potato production will allow crop rotation with legumes and cereals.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Adoption of crop rotation as a prerequisite to sustain soil fertility and for disease control
3.5 Credit facilitation for agricultural mechanization	▪ Increase area cultivated and thus food security ▪ Increase productivity and reduce margins producing higher profits?	▪ Will enable the adoption of improved technical packages. ▪ Timely operations. ▪ Cultivation of abandoned land.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Requires individuals to operate machinery hire businesses using available credit.
3.6 Credit facilitation for agricultural inputs	▪ Increase food security. ▪ Increase productivity leading to surplus production for cash or barter income.	▪ Halts the decline in soil fertility. ▪ Increasing agricultural productivity will reduce soil degradation and pressure on marginal areas supporting legume flora.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Adoption of crop rotation as a prerequisite to sustain soil fertility and for disease control.
3.7 Demonstration & training for sown fodder crop rotation (particularly alfalfa).	▪ Improve livestock turnoff and increase duration of shed feeding to reduce pressure on village grazing lands.	▪ Delayed start of pasture grazing in the spring and thus reduce erosion and preserve biodiversity.	▪ Reduces pressure on pasture biodiversity and establishes management for sustainable use.	▪ Adoption of improved animal feeding packages.
3.8 Market support services for sustainable crop production	▪ Reduce transaction costs for sale of surpluses ▪ Increase returns from sustainable agriculture.	▪ Increase cash surplus available for re-investment in sustainable agriculture practices.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Participation in village pastures or forest users groups.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
4. Community infrastructure & income generating activities				
4.1 Demonstration and training in milk handling for processing	▪ Increase returns from delivery of higher quality milk to processors.	▪ Increase cash surplus available for re-investment in sustainable agriculture practices.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Participation in village pastures users groups. ▪ Collaborate with USDA milk processing project.
4.2 Demonstration and training in fruit/NWFP drying	▪ Increase food security. ▪ Increased opportunities for cash/ barter income.	▪ Helps realize non-timber forest values.	▪ Increases community incentives to conserve & enrich forest resources.	▪ Participation in village forest users groups.
4.3 Credit facilitation through IFAD for irrigation rehabilitation	▪ Provide opportunities to produce high value crops. ▪ Increase and secure agricultural yields. ▪ Increase food security.	▪ Reduce erosion caused by uncontrolled irrigation water damage. ▪ Gravity systems not energy dependent. ▪ Efficient use and management of water.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Associations and Watershed management Boards. ▪ Participation in irrigation training and demonstrations. ▪ Meet IFAD selection criteria.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	**Natural resources conservation (long-term)**		
		Local (micro-watershed) scale	*Global scale*	
4.4 Demonstration and training in sustainable irrigation management.	▪ Provide opportunities to produce high value crops. ▪ Increase and secure agricultural yields. ▪ Increase food security.	▪ Reduce erosion caused by uncontrolled irrigation water damage. ▪ Efficient use and management of water. ▪ Increased crop productivity reduces pressure on marginal areas for crop production.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Associations and Watershed management Boards.
4.5 Demonstration and training in orchard management & establishment	▪ Provide opportunities for high value production. ▪ Increase food security. ▪ Income generation.	▪ Establish perennial polyculture to stabilize erodible soils.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Assoc'ns ▪ Adoption of sustainable management practices.
4.6 Demonstration and training for sustainable production of vegetables	▪ Improved nutrition. ▪ Income generation	▪ Incorporation into crop rotation system. ▪ Increased returns from irrigation water use.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Assoc'ns ▪ Adoption of sustainable management practices.
4.7 Demonstration and training for sustainable production of grapes	▪ Provide opportunities for high value production. ▪ Increase food security. ▪ Income generation.	▪ Establish perennial polyculture to stabilize erodible soils.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Assoc'ns ▪ Adoption of sustainable management practices.
4.8 Credit facilitation for agro-processing	▪ Improve access to existing credit supply.	▪ Inputs will reduce degradation of soils and pressure on marginal areas.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Participation in village pastures or forest users groups.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
4.9 Demonstration and training for sustainable production of dried fruit & vegetables.	▪ Increase farmers' income while opening new market possibilities. ▪ Incentive for planting fruit trees and growing vegetables.	▪ Increase in number of trees. ▪ Soil conservation. ▪ Vegetables incorporated into crop rotation.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Assoc'ns ▪ Adoption of sustainable management practices.
4.10 Demonstration and training for sustainable cattle production	▪ Increase food security. ▪ Income generation. ▪ Sustainable use of pastures and meadows.	▪ Relies on pasture improvement leading to reduced erosion, increased fertility, increased carrying capacity, biodiversity preservation.	▪ Sustainable grazing of high summer meadows conserves legume biodiversity and pasture sustainability.	▪ Adoption of improved pasture and grazing management. ▪ Participation in village pastures or forest users groups. ▪ Collaborate with USDA milk processing project.
4.11 Demonstration and training for sustainable sheep production	▪ Increase food security. ▪ Income generation. ▪ Sustainable use of pastures and meadows.	▪ Relies on pasture improvement leading to reduced erosion, increased fertility, increased carrying capacity, biodiversity preservation.	▪ Sustainable grazing of high summer meadows conserves legume biodiversity and pasture sustainability.	▪ Adoption of improved pasture and grazing management. ▪ Participation in village pastures or forest users groups. ▪ Collaborate with USDA milk processing project.
4.12 Market support services for horticultural and value added products	▪ Reduce transaction costs for sale of surpluses ▪ Increase returns from sustainable agriculture.	▪ Increase cash surplus available for re-investment in sustainable agriculture practices.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Membership of existing Water Users Assoc'ns ▪ Adoption of sustainable management practices.

Annex 6
Armenia Natural Resources Management and Poverty Reduction Project
Trade Off Matrix-Watershed Management Activities

Activity	Benefits			Required behavior to combine short and long-term benefits
	Poverty reduction (short- and mid-term)	Natural resources conservation (long-term)		
		Local (micro-watershed) scale	*Global scale*	
4.13 Demonstration and training for wool processing.	▪ Increase women's'/ family income.	▪ Increase cash surplus available for re-investment in sustainable agriculture practices.	▪ Increased productivity will reduce pressure on marginal areas that support legume flora.	▪ Requires market for output and willingness of women to adopt the practice.

Annex 7
Armenia Natural Resources Management and Poverty Reduction Project
Selection Criteria for Villages and Micro-Catchments Against which Development Objectives will be Measured

The project was designed in a participatory manner and in collaboration with beneficiaries. This approach will be in effect during implementation. Based on the rural rapid appraisal studies and social assessment broad criteria were identified to test the project environment and poverty alleviation strategies. Selected communities represent different landscape zones, area and type of ecosystem and social dynamics and will be used to test project approach during mid-term review and measure development achievements. The selection of participating communities after year two will be carried out in a fair and transparent manner. The selection criteria of project sites/ communities will be further developed during appraisal.

The broad selection criteria for participating communities and micro-catchments include:

- Social – cohesiveness of communities, including the capacity to actively participate as indicated by community leadership; the aspirations of communities to rehabilitate and sustainably manage the micro-catchments they live; pro-activeness and ability to reach consensus on priority actions; and physical, financial and technical capacity;

- Poverty – poor communities as indicated by village per capita income relative to marz and national benchmarks.

- Environment – diversity of land use and potential for natural resources to recover as indicated by anticipated return on investment and the consequences of doing nothing.

- Replicability - potential for sites to be used as demonstrations by other communities and marzes.

- Project Management - spatial location in the watershed where people's impact on the resources does not preclude meaningful discussion and dialogue to ensure efficient implementation.

In addition the existence of cultural heritage amenities also will be taken into account when selecting the prospective project sites.

Based on these criteria, the executing agencies and implementation consultant will collect data on agreed criteria and analyze topographic; soil; forestry, agricultural and livestock production; social and administrative data for the select micro-catchments and for the subsequent micro catchments. Micro-catchments for subsequent years would be identified by the Project Implementation Unit and executing agencies using the criteria presented above which will be tested during the first year of implementation. By year 3 all villages participating in the project need to be identified in order to utilize credit - grant resources effectively by end of year 5. It should be noted that micro-catchment boundaries are not rigid, and can be modified to reflect village boundaries (to make village pasture management plans more complete, for example), and political or socio-economic realities. A possible phasing of participatory watershed management project activities could be following:

Total Number of Participating Villages

	Yr1	Yr2	Yr3	Yr4	Yr5	Total
Initial Contact	18	12	10	0	0	40
Micro-catchment planning	10	15	15	0	0	40
Implementation	10	20	30	40	40	40