

PROJECT BRIEF

1. IDENTIFIERS:

PROJECT NUMBER:

PROJECT NAME:

Georgia - Agricultural Development Project II

DURATION:

4 years

IMPLEMENTING AGENCY:

World Bank

EXECUTING AGENCY:

Ministry of Agriculture

REQUESTING COUNTRY OR

COUNTRIES:

Republic of Georgia

ELIGIBILITY:

Ratified UNFCCC on July 29, 1994

GEF FOCAL AREA:

International Waters and Climate Change

GEF PROGRAMMING FRAMEWORK:

Water Based Operational Program (OP 8)

Promoting the Adoption of Renewable Energy by
Removing Barriers and Reducing Implementation
Costs (OP 6)

2. SUMMARY:

The overall development objective of the Project is to increase agricultural production sustainably, while reducing pollution of natural resources. It represents the first phase of a ten-year Program, to be implemented in three phases, for the reform of on-farm agricultural and environmental practices. Under phase one, the Project, GEF would support the costs of implementing measures aimed at: (a) improving on-farm environmental practices, such as storage and management of manure water quality monitoring, which over the long term would reduce nutrients from entering the Black Sea; and (b) reducing greenhouse gases by promoting the use of biogas energy among rural household through technology demonstration and removal of institutional, capacity related, marketing and financial barriers to its more widespread use. GEF support for phases two and three of the Program is also envisaged, with the scope to be determined following the mid-term review of the Project.

3. COSTS AND FINANCING (US\$ MILLION):

GEF	US\$ 2.50 million
Subtotal GEF	US\$ 2.50 million
Co-financing:	
IDA	US\$ 4.65 million
Government/Beneficiaries	US\$ 1.10 million
Total:	US\$ 8.25 million

4. ASSOCIATED FINANCING (US\$ MILLION):

N/A

5. OPERATIONAL FOCAL POINT ENDORSEMENT:

Name: Merab Sharabidze

Title: Deputy Minister

Organization: Ministry of Environment
of Georgia

Date: March 1, 1999

6. IA CONTACT:

Mahesh Sharma, Sr. Regional Coordinator

Eastern Europe and Central Asia, Tel: (202) 473-2296

Fax: (202) 522-3256, E-Mail: Msharma1@worldbank.org

A: Project Development Objective

1. Project development objective and key performance indicators (see Annex 1):

Project Development Objectives. The overall development objective of the Project is to increase agricultural production sustainably, while reducing pollution of natural resources. In support of this objective, the Project would assist the Government of Georgia (the Government) in developing and implementing efficient and cost-effective agricultural knowledge and information systems and in demonstrating, disseminating and promoting the adoption of modern technologies and agricultural practices that are economic and environmentally sustainable. The latter would cover, low input tillage systems, crop rotations, and better management of crop protection chemicals and livestock production systems in terms of storage, handling and use of animal manure. These technologies and agricultural practices, in addition to raising rural incomes and reducing poverty through increased productivity and profitability of the small Georgian farmers, will reduce soil erosion and discharge of organic matter and yield substantial benefits in terms of improved quality of Georgian surface and ground waters and the Black Sea, a critical regional resource.

Project Global Environmental Objectives. The Project will initiate measures aimed at improving on-farm environmental practices, which over the long term would reduce nutrients entering the Black Sea. The Project activities especially those relating to managing better the storage and application of manure are directly linked to “The Black Sea Strategic Action Plan” formulated with the assistance of GEF. It was the first to develop a systematic approach to policy development through the application of a Transboundary Diagnostic Analysis. Results of the pollution source inventory conducted during the preparatory work shows that non-point sources of agricultural pollution is the most serious problem facing the Black Sea. In addressing this problem, through support for relatively low costs investments, policy adjustments, changes in consumers practices and employing alternative technologies, the Project would also complement the Danube Delta Environmental Program and assist the Government in meeting its international commitments under the Bucharest Convention.

Appropriate storage is critical for the improving the management of manure. Stored manure generates methane - a greenhouse gas - which unless used, would be emitted in into the atmosphere. Therefore, an ancillary global environmental objective of the Project is to reduce greenhouse gas emissions by promoting the use of biogas energy among rural farmers. Specifically, it would focus on the identification and removal of technological and institutional barriers through technology demonstration, capacity building, training and reduction of implementation costs. This will form the first phase of the Project which may be followed by a larger-scale, commercial adoption in the second phase. The appropriate scale, financing modality and GEF involvement for the second phase of the project will be decided at a later stage and submitted to GEF as a separate Project. Performance indicators for the climate change component would relate to the technical performance of the equipment, local capacity to run and maintain the systems, and market transformation indicators such as familiarity with the technology. See Annex 1 for details.

B: Strategic Context

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

CAS document number: 1700-GE Date of latest CAS discussion: September 12, 1997

The Project fully supports the CAS objectives, including: (i) deepening and diversifying the sources of growth; (ii) reducing poverty; and (iii) protecting the environment through sustainable natural resource management.

The thrust of the Project is on providing services to private farmers in technology dissemination and adaptation so that they are better prepared to respond to the emerging market conditions and global environmental needs. As Georgia has one of the least distorted agricultural sectors, a strengthened research, extension and training system and the adoption of environmentally sustainable agricultural practices would assist farmers in realizing more fully their potential for food and fiber production. In line with the Government policy, the provision of more productive technologies and improved access to information would also support more efficient production for traditional export markets as well as the development of new products. Higher farm-level output would raise rural incomes and reduce poverty

(b) GEF Operational Strategy/Program Objective Addressed by the Project: The Strategic Action Plan for the Black Sea, supported by GEF, provides a sound basis for the Project. It would also complement the initiatives under the Danube Delta Environmental Program. The Project's objective of reducing non-point sources of pollution from agriculture is consistent with GEF Operational Program Number 8, "*Waterbody Based Operational Program*", which focuses "mainly on seriously threatened water-bodies and the most important transboundary threats to their ecosystems". Under the Program, priority is accorded to projects that are aimed at "changing sectoral policies and activities responsible for the most serious root causes or needed to solve the top priority transboundary environmental concerns".

As for the objective of promoting the use of biogas, this is consistent with GEF Operational Program Number 6, "*Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs*". The Program is designed to promote widespread use of renewable energy technologies, such as biodigesters, because they "offer some of the best prospects for achieving deep reductions in greenhouse gas emissions at the global level".

The Project will provide an opportunity for the GEF to be a catalyst for actions to bring about the successful integration of land and water resource management practices. GEF support will reduce costs and barriers to farmers in adopting improved sustainable agricultural practices (including the use of bio-digesters). It will also help develop mechanisms to move from demonstration level activities to operational projects that reduce non-point source pollution from agriculture to the Black Sea and reduction in carbon emissions to the atmosphere. The Project builds on the Poland – Rural Environment Project and is expected to serve as "model" for initiatives to be launched in the other littoral states and for which a strategic partnership between

the GEF and Bank is envisaged. UNDP, UNEP and the Bank are jointly preparing a Black Sea Environmental Program proposal for Council's consideration, possibly in September 1999. The strategic partnership would be an integral component of the Program.

2. Main sector issues and Government strategy:

Agriculture is the mainstay of the Georgian economy, accounting in 1997 for about 28% of GDP and about 55% of employment. Agricultural production was seriously disrupted during the civil conflict that followed independence in 1991. Since 1994, however, agricultural output has started to recover and significant progress has been made in areas of land reform and farm restructuring. Distribution of land has essentially created a smallholder, or subsistence sector and a commercial sector. Smallholders, estimated to number 1.02 million, on average have about 1.1 ha of garden and farmland in rural areas. Also, they can lease small amount of land not yet distributed. Of the total land area, only about 26.4% is privately owned; the rest is still owned by the Government, including a large area of rangelands as well as land that is leased to smallholder and commercial farmers. In terms of land under arable crops and perennial trees, about 58% is in private hands and a further 25%-30% is leased, implying that approximately 85% of the total arable land is farmed privately. As for the commercial sector, it comprises 41,000 individuals and 5,500 enterprises, with farm size ranging from 5 ha to more than 100 ha, excluding leased land.

As the Government was been unable to lease all arable land during the 1998 cropping season, substantial areas were left uncultivated. The land market is developing albeit slowly, but its pace is expected to accelerate once owners are allowed to sell or lease their lands, starting this year. The first Agricultural Development Project (ADP1) is assisting with land mapping and registration, for which procedures and methodologies are being developed under two pilot schemes.

Main Sector Issues: In addition to those arising from the transition to a market economy and the distribution of land to smallholders with minimal farming experience, the main issues facing the sector are:

- cash constraints and limited access to credit;
- shortage of inputs, particularly good seeds, and inappropriate seed legislation;
- obsolete agricultural machinery and shortage of spare parts, equipment and service facilities;
- outmoded research, extension and training services ill suited to meet the needs of the emerging market economy;
- inadequate marketing systems and infrastructure; and
- degradation of surface and ground water resources and of the Black Sea, caused mostly by non-point sources of agricultural pollution.

Government Strategy: The Government's strategy for the sector, prepared by the Ministry of Agriculture and Food, issued as a Presidential Decree on April 7, 1997, is outlined in a report entitled 'Concept of Agrarian Policy of Georgia'. The thrust of the strategy is on developing more fully the country's agro-industrial potential to meet internal demand and increase exports earnings. It is underpinned by policies aimed at land reform and establishing competitive input and output markets and an enabling legal and regulatory environment conducive to attracting private investment. Under the strategy, only assets of strategic importance will remain in the state sector over the short to medium term.

The Bank is supporting the Government in implementing the strategy through ADP1, which is co-financed by IFAD. Its key components include: loans to private enterprises engaged in economic activities in rural areas; a credit scheme for small farmers and micro-enterprises; promoting the development of land markets; and preparation of an agricultural sector investment program. Under its Regional Initiative, the Bank has started work on issues relating to reform of the agricultural research complex. Also, with the support of ISNAR (IFAD), the status of the agricultural knowledge and information systems has been reviewed and a Country Profile report has been issued.

Georgia has entered a new phase of environmental activism, with the transition to a parliamentary democracy. The Ministry of Environment responsible for coordinating government efforts to protect and conserve the country's environment, has made important progress in strengthening the legal and regulatory instruments for improved management of Georgia's environment through enactment of major environmental legislation. These include the "Environment Protection Law", (1996), the "Law on Environmental Permits" and the "Law on State Ecological Expertise". A National Environmental Action Plan (NEAP) is under consideration for formal adoption by the Government. Georgia has also ratified the Bucharest

Convention for the Protection of the Black Sea Against Pollution (1992), the Odessa Ministerial Declaration (1993) and is a participating in the preparation of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (1996).³ Sector issues to be addressed by the project and strategic choices:

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

Sector issues to be addressed: The Project will build on the initiatives currently being implemented under ADP1 and extend and deepen the reform of the sector through measures aimed at addressing the following key issues:

developing the capacity of private smallholder and commercial farmers through introduction, validation and dissemination of improved technologies at the farm level, covering production, post harvest, operations, inputs, marketing and natural resource management;

making research, extension and training more responsive to the needs of farmers and relevant to the emerging market conditions;

fully integrating environmental concerns into agricultural practices to make them more sustainable, including the better management of nutrient and chemical loads; and

as part of the overall management of nutrient load, demonstrating environmentally friendly biodigestors and removing barriers to their more widespread use.

Strategic Choices. Three strategic choices were made before proceeding with the preparation of the Project. **First** was whether investments in Georgia's agricultural knowledge and information systems were justified at this juncture. In this regard, the fact that land reform, an initiative fully supported by the Bank, had resulted in ownership of farmland being vested in individuals with minimal experience with farming was critical. Without providing the smallholders and commercial farmers with access to information of agricultural practices and technology, it was highly unlikely that the reform would yield anticipated benefits. That existing institutions would be able to provide such information in an efficient and cost-effective also was equally unlikely, given that they were not designed to meet the needs of the sector as it has evolved. On that basis, the timing of the operation was deemed appropriate.

Second was whether to reform the exiting institutions or build new ones. The latter was rejected on the grounds that this would not only be divisive but also protracted and, hence, not in the interest of the country. The reforms envisaged are designed to meet three requirements: transparency through greater stakeholder participation; accountability; and greater efficiency and cost-effectiveness. For this, the project would support a Competitive Grants Scheme (CGS) – a key innovation of the Project. Details of the CGS are discussed under the implementation arrangements section.

Third was with respect to the scope of the Project. The Black Sea plays a crucial role in the welfare of Georgia's population. Sustainability of Georgia's economic growth will depend, in part, on the Government's ability to integrate development of the many productive sectors of the Black Sea coast, including agriculture and forestry. Over the past decade, uncontrolled pollution from point and non-point sources, coastal erosion, intensified by human intervention and off-shore dumping in the region has devastated the Black Sea and its littoral zone. Lost revenues from these traditional sectors and the cost of mitigating future environmental impacts from non-point source of agricultural pollution could have serious adverse impacts on the budget and places of strategic and economic importance. On this basis the scope of the project was expanded to included a component aimed at protecting the water quality of the Black Sea from non-sources of agricultural pollution.

C: Project Description Summary

1. Project components (see Annex 1):

The Project, representing the first phase of a ten-year Program, would be implemented over a period of four years (1999/00 –2000/03). It comprise the following three components: adaptive research and extension; agricultural research, extension and training system reform; and on-farm environment management. Details relating to these are summarized below.

Adaptive Research, Extension and Training would support the introduction and validation of known modern technologies and practices at the farm level - covering production, post-harvest operations, inputs, marketing and natural resource management - and their dissemination. It would also support studies aimed at identifying policy and regulatory reforms impeding the development of the sector and the measures required to address them. In addition, with the view to promoting public/private sector partnership and to ensure that technologies/practices to be introduced are fully responsive to the needs of the smallholders and commercial farmers, their full participating in developing the agenda for this component is planned, along with that of the agricultural research complex, the development community at large including universities, Georgian farmers associations and NGOs. The agenda for the first year of implementation is currently being planned and is expected to be completed by end-April 1999.

Agricultural Research, Extension and Training System Reform provides for technical assistance for the preparation of a comprehensive framework for rationalizing and streamlining the institutional infrastructure for agricultural research, extension and training. The Georgian Academy of Agrarian Sciences, State Agrarian University and Ministry of Agriculture would be involved in developing the framework as would be the other relevant institutions and stakeholders.

On-farm Environmental Management would support in selected representative villages the preparation of farm management plans that explicitly incorporate environmental implications of agricultural practices and on-farm trails and demonstrations of sustainable agricultural practices, including reduced tillage, better storage, management and application of manure and fertilizers, terracing, contour farming and buffer strips for improving water quality. In addition, it would also

finance investments in establishing a water quality monitoring program and in manure storage facilities, buffer strips, constructed wetlands, etc.

As stored manure can be used to generate methane for household use, this component also provides support for a pilot scheme to demonstrate bio-digester technology and technical assistance for removing the barriers to its more widespread use, including the dissemination of information about the technology, training to build local capacity for construction and operations and management, market development and mechanisms for financing the capital costs.

Project Implementation Unit. A small Project Implementation Unit (PIU) – comprising Head of PIU, an accountant and a secretary - would be established within the World Bank Projects' PCU. The unit will draw on existing procurement, accounting and finance staff within the PCU for administering the project funds.

Support would be provided to the PIU in the form technical assistance and equipment and materials required to manage and monitor the implementation of the day-to-day Project activities.

The total cost of the ten-year project is estimated at about US\$23.0 million, excluding GEF contribution for phases two and three, which are to be firmed up following the mid-term review in consultation with the GEF. As summarized in Annex 2, tentative estimates, excluding GEF contribution, for phases two and three are US\$8.85 million and 5.85 million. Details of the cost estimates of the Project, covering the first phase, are presented on the next page.

<u>Component</u>	<u>Category</u>	<u>Indicative Costs a/(US\$M)</u>	<u>% of Total</u>	<u>Bank- financin g (US\$M)</u>	<u>% of Bank- financin g</u>	<u>GEF Financing (US\$M)</u>	<u>% of GEF Financing</u>
1. Adaptive Research, Extension and Training. Through the CGS, promote the introduction, validation and adoption of modern technologies for covering production, post harvest operations, inputs and marketing Value of competitive grants to be awarded a/ Cost of Secretariat for four years Total CGS	Institution Building/ Technology Development	3.00 <u>0.75</u> 3.75	36.4% <u>9.1%</u> 45.5%	2.55 <u>0.75</u> 3.30	54.8% <u>16.2%</u> 71.1%		
2. Reform of the Agricultural Research System. Technical assistance and training to accompany a reform program. Develop priority setting capacities and AKIS reform strategy.	Technical Assistance & Capacity Building	1.15	13.9%	1.15	24.6%		
3. Improved Environmental Practices. To be funded by GEF through the CGS for environmentally sound practices and biogesters	Natural Resource Management	2.8	34.0%			2.15	86.0%
4. Project Implementation Unit – small unit using administrative resources of existing PCU.	Project Management	0.55	6.6%	0.20	4.3%	0.35	14.0
Total		8.25	100%	4.65	100.0%	2.50	100.0%

a/ Three tranches of about 20 sub-projects averaging the equivalent of US\$50,000. Assumes that organizations carrying out sub-projects contribute about 15% of costs, primarily in kind.

b/ To be determined in conjunction with GEF.

2. Key policy and institutional reforms to be sought:

The project would support the Government in improving the efficiency and cost effectiveness of agricultural research, extension and training to meet the needs of the private farming sector and honor its commitments under the Bucharest Convention to protect and rehabilitate the Black Sea through *inter alia* the adoption of environmentally sustainable agricultural practices. An initial review of the organization of agricultural research, extension and training activities, undertaken with the assistance of ISNAR, underscores the need for making these more cost-effective and efficient and equally importantly, responsive to the emerging needs of the smallholder and commercial farmers. The CGS would launch the reforms needed to foster the achievement of these objectives. Specifically, it would promote decentralized project implementation, introduce greater transparency and accountability through broader stakeholder participation in priority setting and reduce costs and efficiency by encouraging partnerships between researchers, farmers,

extensions workers and NGOs.

3. Benefits and target population:

Private farmers and agro-processors will be the main beneficiaries of the Project. Introduction of improved technologies would result in higher productivity and lower costs of production and, in turn, in increased profitability and improved living standards in rural areas - the incentives needed to invest further in farms and businesses. Higher productivity and better animal nutrition, management and health will bring about improvements in product quality to meet specific market needs, including those of export markets. The types of farms benefiting will range from smallholders (around 1 ha land and part-time farmers) with small crop or livestock surpluses to sell from time to time, to larger farms with land ranging in size from 5 ha to about 50 ha.

Investments in applied agricultural research (coupled with effective technology transfer) generally yield relatively high returns, especially when starting from a low technological base. The involvement of a broad range of stakeholders, especially farmers, in adaptive agricultural research will increase its practical relevance, a related benefit of the Project. The establishment of CGS along with capacity building and training will help build a sustainable system capable of generating improved technologies responsive to the needs of end-users.

The country, the public at large and the global community would also benefit from the adoption of environmentally sustainable activities to be implemented under the Project. Specifically, reducing the discharge of nutrient load into the Black Sea will promote the maintenance of productive ecosystems and critical natural habitats in the freshwater, estuarine and nearshore waters along the Black Sea Coast. Broad-based stakeholder participation will increase public awareness and demand-driven approaches for protecting the Black Sea.

4. Institutional and implementation arrangements:

Project Co-ordination: The Project would be implemented under the aegis of the Ministry of Agriculture and Food (MAF), with specific responsibility for overall co-ordination assigned to a Project Co-ordinator to be designated by the line Minister.

To provide oversight at the highest level, the Inter-Ministerial Commission, established by Presidential Decree #357 of May 28, 1998, will have purview over the reform of the Agricultural Research, Education and Extension System. The Inter-Ministerial Commission would be responsible for the resolution of policy and project implementation issues.

The World Bank Projects' Coordination Unit (PCU) would be responsible for all procurement related activities and for accounting and financial aspects of the Project, including the allocation and disbursement of Project funds. A small Project Implementation Unit (PIU) – comprising Head of PIU, accountant and secretary – would be established within the PCU.

Implementation arrangement: Activities associated with the research, extension and training reform component would be implemented by a small unit, housed in the Georgian Academy of Agrarian Sciences, and reporting directly to the Inter-Ministerial Commission.

Activities covered under the Research, Extension and Training and On-farm Environmental Management components will be implemented through the CGS, to be managed by a Competitive Grants Board and Secretariat. The members of the Competitive Grants Board were appointed in December 1998 and comprise a Chairman and twelve members representing all relevant stakeholders, including smallholder and commercial farmers, farmers associations and NGOs. The Chairman and over one-half of the members have no affiliations with either the Government or the research, extension and training complex. The Secretariat would comprise four technical specialists covering crop, livestock, economics and environmental disciplines plus administrative staff. The economist would head the unit and would also be a member of the Board. Functionally the Secretariat would be responsible to the Competitive Grants Board, but administratively to the PIU.

Procedurally, a menu of activities relating to on-farm validation and dissemination of known technologies, initially covering those directed at immediate improvements in productivity and on-farm environmental management, including for storage and use of manure, would be identified and agreed upon by the stakeholders. The range of activities deemed eligible would be expanded, once the process of reform is well underway. A process of selecting potentially eligible activities to be implemented initially is underway, based on the priorities identified by farmers and agro-processors, and is expected to be completed by end-April 1999.

Following agreement on the menu of activities to be implemented, proposals would be solicited publicly by the Competitive Grants Board. The Secretariat will evaluate the proposals with the assistance of local and international peer reviewers, against predetermined criteria such as, relevance to the farming community, contribution to national priorities, technical quality and scientific merit, qualifications and experience of the sponsor, plans for transfer of technology and environmental impacts. Approved proposals would be funded and supervised by the PIU with the assistance of consultants. Such funds could cover laboratory equipment, vehicles, materials, office equipment, travel costs, short-term training, field labor, fuel and supplies. Large items of equipment would not be financed under the Project. Initial payment, as a mobilization advance would amount to 25% of the total value of the contract. The balance would be paid on the basis of progress against specific milestones.

The Project would also cover technical assistance for CGS and the operating costs of the Secretariat.

In order to mainstream CGS, the working group charged with the preparation of the Project is exploring with the Department of Science and Technology and Ministry of Economy how best to link the proposed CGS with others for the allocation of 15% of Research and Development Funds (all sectors).

Accounting, financial reporting and auditing arrangements. The PCU will maintain project accounts in line with International Accounting Standards covering all transactions related to project activities and will prepare annual statements of receipts and expenditure. The pre-appraisal mission will assess the financial management, internal controls and accounting system of the project agency to ensure it is capable of managing the project. Project accounts and the Special Account would be audited in accordance with the International Standards on Auditing and World Bank's guidelines. The project will be in compliance with the Bank's LACI initiative.

Monitoring and Evaluation arrangements: Project monitoring and evaluation would be the responsibility of the PCU. Simple management information system for M&E, reporting formats for each component, including targeted annual performance objectives and monitoring indicators, using Annex 1 details as the basis, would be developed during preparation. A mid-term review will be carried out to assess overall progress. Lessons learned from the CGS and progress with the reform of the research complex would be used in restructuring the Project, in the event needed.

D: Project Rationale

1. Project alternatives considered and reasons for rejection:

Alternatives considered were: (a) to make direct investments in the existing knowledge and information systems institutions (universities, research institutes etc.) once a complete implementation plan for restructuring the agricultural research system had been agreed; or (b) to attach a small field trials and demonstration component to the irrigation project. With regard to (a), it was concluded that the work already done in collaboration with ISNAR demonstrated the readiness of the Government and agricultural research complex to tackle reform of the system. Accordingly it would be desirable to proceed in a step-wise process with the Project providing technical assistance and capacity building. Furthermore, farmers and agro-processors were urgently in need of technical and business information and its provision should not be delayed

Also, the task of promoting environmentally sustainable agricultural practices could have been left to the Ministry of Environment or NGOs. However, it was decided that to ensure the participation of all relevant stakeholders, a firm commitment for promoting sustainable agricultural practices and to build national capacity for improving and protecting the waters of the Black Sea, the best route would be to adopt the Competitive Grant Scheme System.²

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

Sector issue	Project	Latest PSR Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
<u>Bank-financed</u> Land reform, agro-processing, agricultural credit	Agricultural Development Project	S	S
Environmentally Sustainable Agricultural Practices and Protection of the Black Sea			
	Municipal Infrastructure Rehabilitation—MIRP	S	S
	National Environment Action Plan (IDF/Bank)	N/A	N/A
	Forestry Biodiversity Project	N/A	N/A
	Cultural Heritage Project	S	S
	Biodiversity Strategy and Action Plan (GEF/Bank)	N/A	N/A
	Integrated Coastal Management Project	N/A	N/A
<u>Other development agencies</u>			
Credit for grain production and support to creation grain market	TACIS – RARP1	In progress	
Establishment of rural information centers	TACIS	In progress	
Development of agro-business consultancy centers	TACIS – ABC	In progress	
Agro-business development, preparation of business plans	Know How Fund	In progress	
Seed privatization	FAO	Proposals made but no agreement	
Supply of agricultural machinery	Japan grant	In progress	

Development of private sector agriculture	GTZ	In progress	
Small farmer extension	CARE	In progress	
Development of Maize, Wheat, Potato and Sunflower seed production in private sector	USAID	In progress	

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

3. Lessons learned and reflected in proposed project design:

Key lessons learned from agricultural and environmental projects in the region include:

The need for long-term commitment to address agriculture and environment issues through phased programs of interventions and broad-based participation;

The need to work directly with farmers to encourage ownership of the initiatives;

The high capacity of local and national Government officials for innovation and effective management;

The importance of calculating and disseminating the benefits of improved environmental management in rural areas;

The importance of adequate counterpart training and specialized support for project related activities, especially procurement, disbursement and supervision; and

The benefits of catalyzing support from within for policy and environmental reforms.

In Macedonia, a system for competitive grant funding of adaptive research has been successfully applied over three years. Use of the CGS has shifted the focus to on-farm work addressing farmers' immediate needs and demonstrated the importance of linking technology adaptation to dissemination as one adaptive research proposal. The project also confirms the pre-project effort needed to train potential grant applicants' in the preparation of proposals. Initially the majority of the successful proposals came from the existing research and education structure and special provisions are needed to encourage private sector submissions. Under the proposed project PPF funds will be used for pre-project training and will include provisions for encouraging greater private sector participation.

4. Indications of borrower commitment and ownership:

In reaffirming its commitment to the Project, the Government established an Inter-Ministerial Commission in May 1998 to oversee the reform of the agricultural research, extension and training complex. Also, a working group was established to work on initial data collection and analysis with the assistance of ISNAR. The information collected by the working group formed the basis of a workshop held on September 15 and 16, 1998, which was chaired by the Minister of Agriculture and attended by representatives of research organizations, development agencies, civil society, farmers associations and NGOs. A good dialogue was established and a number of institutional issues were clarified, both during the workshop and the Identification Mission with which it coincided.

Following the Identification Mission, the Georgian counterparts prepared a draft of the “Guidelines for the Organization and Operation of Competitive Grants Scheme for Agriculture” based on the “Practitioners Guide to CGS” (ECSSD, August 1998). In December 1998, the Minister of Agriculture nominated the Chairman and members of the Competitive Grants Board. At its first meeting, held on December 10, the designated head of the Secretariat presented to the Board, an overview of the CGS’s objectives and organizational arrangements. Work has started on the selection of priority topics for the first round of grant proposals to be submitted to the Competitive Grants Board for approval in February 1999.

Arrangements for handling the reform of the Agricultural Research, Education and Extension system have been agreed with the President of the Georgian Academy for Agricultural Sciences (GAAS) and the Rector of the Agrarian University (GAU). Initially, a two-person Working Group (one from each institution) would be set up to review the organizational structure of the Georgian agricultural research, education and extension system, for use by the Inter-Ministerial Commission. This work will be done in collaboration with and technical support of ISNAR. The initial review is expected to be completed by end-June, 1999.

The Minister of Agriculture, in principle, has endorsed the institutional arrangements for managing the CGS as well as the reform of the Agricultural Research, Education and Extension system and the on-farm environmental management program. The legal processes for establishing the CGS, the Competitive Grants Board and its functional relationship with the Secretariat have also been agreed and MAF has confirmed that the necessary steps would be completed by Negotiations.

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

Assistance from other donors in research and advisory services has rightly focused to date on tackling credit and input issues as well as establishing some fledgling farmer information services. Now there is a need for critical technological and information backstopping to support the Government’s efforts to improve the performance of the agricultural sector. Bank experience in other countries would help map the transitional steps and create and maintain ownership for such transition on the basis of demand-driven investments. The Bank’s value added derives from its experience worldwide in reforming agricultural research, extension and training services.

The principal value added of GEF support for the Project comes from providing additional funds to promote renewable energy and to address the priority transboundary water problems of the Black Sea. The GEF has already added value by supporting the Poland – Rural Environmental Project, which underpins the Project.

GEF funds will specifically help reduce the barriers to farmers' adoption of environmentally sensitive practices and will allow the Government to consider expanding early pilot operations into a larger program. Without GEF support to coordinate these activities, Georgia might undertake a series of small activities in different parts of the country to address these issues. It would lack a mechanism to coordinate the financing, approaches and geographical targeting of activities. Without support from the GEF, the project would lack sufficient resources to accelerate the program, to demonstrate measures on a wide range of farm types and to undertake a public outreach program. The GEF is thus leveraging funds from other donors and stimulating a program to coordinate activities, increase coverage and generate larger impact.

Because of their international scope, the World Bank and GEF can provide funds and finance the incremental costs for replicating such activities both within Georgia and in other countries in the region. This is particularly important, as agricultural pollution is a major local and transboundary problem in most countries in the ECA region, particularly those in the Baltic, Danube and Black Sea drainage basins. Some level of financial support from the public sector and the international community will continue to be necessary, particularly in lower income countries, because these activities address externalities, affect transboundary pollution and involve an element of public good.

E: Issues Requiring Special Attention

1. Economic

☐ Summarize issues below (e.g., fiscal impact, pricing distortions)

☐ To be defined (indicate how issues will be identified) ☒ None

Economic evaluation methodology:

☒ Cost benefit ☐ Cost effectiveness ☒ Other: Incremental Cost Analysis

Cost benefit analysis to be carried out following pre-appraisal.

Incremental Cost Analysis: The preliminary incremental cost analysis for the Project is presented in Annex 3. The analysis assumes a baseline under which the prevailing agricultural practices are only partially corrected, resulting in continued discharge of nutrients into the Black Sea and emissions of methane. Continued reliance on fossil fuels and unsustainably harvested fuelwood, the source of energy in rural areas, further increases greenhouse gas emissions. The Project would introduce and demonstrate more sustainable and environmentally benign technologies and practices at an estimated incremental cost of US\$2.5 million. This analysis will be refined and discussed with the Government in the course of Project preparation.

2. Financial

☒ Summarize issues below (e.g., cost recovery, tariff policies, financial controls and accountability)

☐ To be defined (indicate how issues will be identified) ☐ None

The recipients of funds under the CGS would be expected to contribute either in cash or kind about 10% to 15% of the cost of any individual research project and about 20% to 25% of the cost of equipment for environmental management. This provision would encourage institutes, individuals and other agencies submitting requests, to confirm up front the priority they give to the proposal. However the difficulty of meeting this contribution under present budgets would be mitigated by including the salary costs of research staff assigned to the proposal as well as a value for existing building and machinery assets to be used. Funds from the Bank credit will support the purchase of research equipment, machinery and materials, training of researchers and incremental operating costs. Given the low level of salaries within the research institutes, it would be necessary to include a project allowance for staff working on each sub-project.

The overall financial controls and management by the PCU/PIU to enable close monitoring of the project finances and its expenditures will be addressed during the pre-appraisal mission.

The CGS should not be seen as a replacement either for core funding of the research complex or for meeting the future costs of equipment needed for sustainable on-farm environmental management. Agreement will be reached with the Government on the amount of annual budget to be allocated to the Agricultural Research, Education and Extension system. As for the on-farm environmental management component, a financing modalities would be assessed on how to cover first costs.

3. Technical

☒ Summarize issues below (e.g., appropriate technology, costing)

☐ To be defined (indicate how issues will be identified) ☐ None

Based on available information, the majority of Georgian farmers would benefit from advice and technology for: (a) farm planning and management; (b) crop agronomy and integrated cropping systems; (c) new crops to diversify systems, (d) livestock management, (e) good quality seeds and planting material, and (f) for sustainable on-farm environmental management. During preparation farm surveys have been reviewed and additional information sought to better define priorities – and thus the categories for which CGS proposals will be requested and evaluation criteria. In addition, an inventory will be carried out of “on the shelf technology” to identify relevant farm and environmental technologies that are fully developed and have been adopted in certain areas, but not yet promoted across the country. The technologies for reducing water pollution are known; however, these have to be validated and demonstrated under Georgian conditions. Bio-digester technology will require fine-tuning and adaptation to Georgian conditions.

4. Institutional

☒ Summarize issues below (e.g., project management, M&E capacity, administrative regulations)

☐ To be defined (indicate how issues will be identified) ☐ None

Other schemes: Link with competitive scheme managed by the Department of Science and Technology, Ministry of Economy. The links between project activities and those of the Department will be worked out by the preparation group prior to pre-appraisal.

Potential conflict of interest on the Competitive grants Board: There is a potential conflict of interest on the Competitive Grants Board with members representing a diversity of organizations that could benefit from competitive grant funding. This risk will be mitigated by (i) setting clear criteria against which submissions under each technology adaptation and dissemination category would be evaluated; (ii) the process of evaluation using local and international specialists to do the technical evaluation of proposals and (iii) inclusion of farmer and private sector representatives on the Board.

Lack of competition for grants: Initially, there is a risk that there will be little competition for grants due to the run-down status of the research, education and extension structures and the loss of younger research staff from the main institutes. Also, considerable time will be required to explain the concept and procedures for the CGS. The Competitive Grants Board and its Secretariat will (a) run a publicity campaign to explain the CGS opportunities and procedures to the agricultural research and development community, and (b) hold training workshops prior to project effectiveness to facilitate an early uptake once funds become available.

5. Social

☐ Summarize issues below (e.g., significant social risks, ability to target low income and other vulnerable groups)

☒ To be defined (indicate how issues will be identified) ☐ None

Sociological studies conducted as part of the preparation of the Irrigation and Drainage Rehabilitation Component (IDRC) have identified the different target groups within the areas to be rehabilitated. While three recent farm-level studies (including a rural Poverty Study by IFAD) describe the existing farm structure in specific regions. These results of these studies are being used in the priority setting process to define topics for support by the CGS that would provide smallholders on-farm demonstrations of appropriate agricultural and environmental management technologies.

A Social Assessment will be done.

6. Environmental

a. Environmental issues:

☐ Summarize issues below (distinguish between major issues and less important ones)

☐ To be defined (indicate how issues will be identified) ☐ None

Major: None

Other: No adverse environmental impact is expected from this component. Proposals requested under the CGS will explicitly exclude technologies that might damage the environment and promote those that are environmentally sustainable. Furthermore the proposed GEF component would support measures to reduce environmental pollution.

b. Environmental category: ☐ A ☐ B ☒ C

c. Justification/Rationale for category rating:

d. Status of Category A assessment: EA start-up date:
Date of first EA draft:
Current status:

e. Proposed actions:

f. Status of any other environmental studies:

g. Local groups and NGOs consulted: (List names): To be completed. The NGOs are represented on the Competitive Grants Board.

h. Resettlement

☐ Summarize issues below (e.g., resettlement planning, compensation)

☐ To be defined (indicate how issues will be identified) ☒ None

i. Borrower permission to release EA: ☐ Yes ☐ No ☐ N/A

j. Other remarks:

7. Participatory Approach:

a. Primary beneficiaries and other affected groups:

☒ Name and describe groups, how involved, and what they have influenced.

☐ Not applicable (describe why participatory approach not applicable with these groups)

The primary beneficiaries of this project are private farmers, i.e. individual producers that produce a surplus for sale, members of family associations and formal associations, agro-processors, and contractors for CGS projects. During preparation, private farmers, agro-processors, and members of the development community will be consulted to ensure that adequate mechanisms are built into the project design. This was extended to more formal diagnostic surveys in selected areas as the project proceeds. Two of the members of the Competitive Grants Board are private farmers and two other members represent farmers' organizations.

b. Other key stakeholders:

☒ Name and describe groups, how involved, and what they have influenced.

☐ Not applicable (describe why participatory approach not applicable with these groups)

All stakeholders (including MAF, GAS, GAAS, Department of Science and Technology, Farmers Union, NGOs, Private Farmers) involved in policy setting and implementation of Agricultural Research, Education and Extension systems.

8. Checklist of Bank Policies

a. This project involves (check applicable items):

- | | |
|--|---|
| <input type="checkbox"/> Indigenous peoples (OD 4.20) | <input type="checkbox"/> Riparian water rights
(OP 7.50) (BP 7.50) (GP 7.50) |
| <input type="checkbox"/> Cultural property (OPN 11.03) | <input checked="" type="checkbox"/> Financial management (OP 10.02) (BP 10.02) |
| <input checked="" type="checkbox"/> Environmental impacts
(OP 4.01) (BP 4.01) (GP 4.01) | <input checked="" type="checkbox"/> Financing of recurrent costs (OMS 1.21) |
| <input checked="" type="checkbox"/> Natural habitats
(OP 4.01) (BP 4.01) (GP 4.01) | <input checked="" type="checkbox"/> Local cost sharing
(OP 6.30) (BP 6.30) (GP 6.30) |
| <input type="checkbox"/> Gender issues (OP 4.20) | <input type="checkbox"/> Cost-sharing above country three-year average
(GP 6.30) (OP 6.30) (BP 6.30) |
| <input type="checkbox"/> Involuntary resettlement (OD 4.30) | <input type="checkbox"/> Retroactive financing above normal limit
(OP 12.10) |
| <input checked="" type="checkbox"/> NGO involvement (GP 14.70) | <input type="checkbox"/> Disputed territory
(OP 7.60) (BP 7.60) (GP 7.60) |
| | <input type="checkbox"/> Other (provide necessary details) |

b. Describe issue(s) involved, not already discussed above:

F: Sustainability and Risks

1. Sustainability:

The objective is to build a cost-effective and efficient institutional infrastructure for research, extension and training services and promote to promote environmentally sustainable agricultural practices, with the participation of all stakeholders. The result should be technology adaptation and transfer programs responsive to the needs of the end-users and in which they will share the costs. The parallel reform and restructuring of the agricultural research complex will result in a slimmer, more efficient public sector structure. The first phase of the project, through education, familiarization and demonstration of environmentally-friendly practices, hopes to increase the acceptability of these practices by larger number of farmers, leading to commercialization of manure management and bio-digester services.

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

<u>Risk</u>	<u>Risk Rating</u>	<u>Risk Minimization Measure</u>
Annex 1, cell "from Outputs to Objective"		
Research does not develop appropriate new technologies to raise productivity and conserve the environment.	L	Encourage development of strategic alliances with international partners and finance specific, well-defined projects with agreed performance indicators.
Domestic and Export markets unable to absorb increased production.	L	Promote crop diversification and market planning, and move into agro-processing.
Farmers don't have access to credit, machinery and inputs, as well as land.	M	Work initially in areas where credit schemes already operating.
Farmers not sufficiently organized to develop partnerships with other farmers and the development community.	M	Provide training schemes for farmers and groups..
Annex 1, cell "from Components to Outputs"		
Ministry of Finance unable to maintain core funding for the agricultural research complex and research salaries remain very low.	M	Agreements to be reached with the Ministry of Finance at credit negotiations.
Process dominated by current research structure.	L	Ensure participation of all stakeholders in priority setting process.
Number of grant applications insufficient to apply stringent evaluation criteria.	L	Provide up-front training for potential applicants.
CGS is not sustainable.	M	Ensure that reform of agricultural research complex proceeds in parallel and seek other sources of funding to create Endowment fund.
Current technology in bio-digesters does not work in Georgia	M	Use experiences with biodigester technology from similar climatic conditions in other countries
Farmers are less willing to accept improved, environmentally-friendly agricultural practices		Similar work has been done in Poland and project will learn from experiences in Poland
New private sources of funding don't come forward.	N	Ensure their participation in project design.
Overall Risk Rating	M	

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

3. Possible Controversial Aspects (Project Alert System):

Risk	Type of Risk	Risk Rating	Risk Minimization Measure

Type of Risk – S (Social), E (Ecological), P (Pollution), G (Governance), M (Management capacity), O (Other)

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

G: Project Preparation and Processing

1. Has a project preparation plan been agreed with the borrower (see Annex 2 to this form):

[x] Yes, date submitted: 12/14/98 [] No, date expected: MM/DD/YY

2. Advice/consultation outside country department:

[x] Within the Bank: GEF [x] Other development agencies: ISNAR

3. Composition of Task Team (see Annex 2)

Messrs. Iain Shuker, Program Team Leader, Jitendra Srivastava, Agricultural Research Specialist; Naushad Khan, Procurement Specialist, TBD, Financial Specialist

4. Quality Assurance Arrangements (Annex 2)

5. Management Decisions:

<u>Issue</u>	<u>Action/Decision</u>	<u>Responsibility</u>

Total Preparation Budget: US\$650,000 Bank Budget: US\$650,000 Trust Fund: (US\$000)

Cost to Date: US\$485,000

GO [] NO GO []

Further Review [Expected Date]

[signature]

Team Leader:

[signature]

Sector Director:

[signature]

Country Director:

Project Design Summary

Georgia: ADP2 – Agricultural Research, Extension and Training Component

Narrative Summary	Key Performance Indicators	Monitoring and Evaluation	Critical Assumptions
Sector-related CAS Goal: Economic growth, poverty alleviation and environmental	Rural household incomes. Capacity to address environmental degradation of the Black Sea	Agricultural statistics National reports	(Goal to Bank Mission) Government and Bank policies do not change adversely. Policy and economic environment encourages use of new technology. Improved agricultural practices contribute to national economy and welfare of the population The costs of inaction outweigh investments in environmental planning and management.
Project Development Objectives: To increase sustainable agricultural production, productivity and rural incomes while reducing natural resource pollution. To develop sustainable Agricultural Knowledge and Information Systems with full participation of all stakeholders. Global Environmental Objective	<ul style="list-style-type: none"> • Crop and livestock production data. • Crop yields. • Value of agricultural exports. • Increased area of adoption of production and resource conservation technologies. • Monitoring of water quality indicators for major water resource bodies. • Private funding of agricultural research and extension increases. 	Agricultural statistics. Social Assessment Economic and Financial Assessment Project M/E unit PIU progress reports	(Objective to Goal) Technologies respond to farmers' needs. Markets and prices provide sufficient incentives to producers and processors. Continuing government commitment Continuing political stability

<p>To develop effective mechanisms to improve the quality of the surface, underground and Black Sea waters by reducing non-point sources of pollution from agricultural and promote the use biogas energy in rural area through demonstration and reduction of barriers to its more widespread use.</p>	<ul style="list-style-type: none"> • Increased awareness of environmental issues related to agriculture among farmers. • High satisfaction rate among participating farmers. • High percentage of participating farmers implementing the farm management plans, including use of biogas units. • Specialists trained in design and maintenance of biogas units, environmental monitoring and education. • Educational materials developed and disseminated on improved, environmentally sustainable practices. • Increased awareness of financial benefits of adopting environmentally sustainable agricultural practices. • 	<p>Annual regional and national reports</p> <p>Interviews with farmer groups and local government</p>	
<p>Outputs:</p> <p>1. An effective system for agricultural technology development, acquisition and adaptation established.</p>	<p>1. Technology Development, Acquisition and Adaptation:</p> <ul style="list-style-type: none"> • Competitive Grant Scheme established and receiving high quality proposals fully meeting criteria. • Satisfactory implementation of 	<p>Monitoring system to be established by CGS secretariat.</p> <p>Project monitoring and evaluation unit.</p>	<p>(Outputs to Objective)</p> <p>Research can develop appropriate new technologies to increase productivity and conserve the environment.</p> <p>Export and domestic markets develop to absorb increased</p>

<p>2. Responsive production, post-harvest and natural resource management technologies developed and transferred.</p> <p>3. Effective linkages between the agricultural research complex and other public and private sector development agencies created.</p> <p>4. Strategy for reform of the agricultural research complex agreed and reform program proceeding.</p> <p>5. Improved capacity created for research, planning and priority setting.</p>	<p>successful proposals.</p> <ul style="list-style-type: none"> • Strategic international alliances developed. <p>1. Development of Appropriate Technology:</p> <ul style="list-style-type: none"> • Number of technologies responding to producer and processors needs released. • Adoption rates by producers and processors. • Reduced pollution. • Demonstrated production increases. <p>1. Effective Research/Extension Linkages:</p> <ul style="list-style-type: none"> • Joint proposals received from GAAS and development agencies (NGOs, Farmers Associations etc.). • Expanded network of information and extension centers. <p>2. Reform of agricultural research complex:</p> <ul style="list-style-type: none"> • Reform strategy adopted. • Reforms underway with rigorous and participatory priority setting adopted for research programs. <p>3. Training and capacity building</p>	<p>Agricultural statistics and Special surveys</p> <p>CGS monitoring system</p> <p>CGS monitoring system</p> <p>Project monitoring and evaluation unit</p> <p>Project Monitoring and Evaluation Unit.</p> <p>Project Monitoring and Evaluation Unit.</p> <p>Resource tracking system.</p>	<p>production.</p> <p>International research programs continue to supply basic strategic research to support new technology development.</p> <p>Farmers have access to credit, machinery and inputs, as well as la</p> <p>Farmers are sufficiently organized develop partnerships with other farmers and the development community.</p> <p>GAAS remains committed to reform of the system.</p> <p>Participating farmers implement sustainable agricultural practices and continue to do so after completion of Bank/GEF investments—technical and financial.</p> <p>Support from local and national government continues.</p>
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[illegible]

a/ Exact amount to be determined with GEF

GEORGIA ADP II
Support for Agricultural Research, Extension and Training

Preliminary Cost Estimate—million US\$

Component	Phase 1	Phase 2	Phase 3	Total
	1999/2003	2003/2006	2006/2009	
1. Competitive Grants Scheme				
Grants a/	3.00	3.00	3.00	9.00
Secretariat	0.75	0.70	0.70	2.15
Sub-total CGS	3.75	3.70	3.70	11.15
2. Support for Reform of the system				
Preparatory studies	1.15			1.15
Investments in restructuring		5.00	2.00	7.00
sub-total Reform program	1.15	5.00	2.00	8.15
3. Global Environment Facility	2.80	TBD	TBD	TBD
4. Project Implementation Unit	0.55	0.15	0.15	0.50
Total Project Cost	8.25	8.85	5.85	22.95

Note: Phase 1 is four years and phases 2 & 3 three years each.

- a/ Three tranches of about 20 sub-projects averaging US\$50,000
- b/ To be determined

GEF Incremental Cost Analysis

GEORGIA

Agricultural Development Project -- II

Component 3: Improved Agricultural Practices to Reduce Environmental Pollution

Overview

1. The general objectives of the GEF Alternative are to protect the quality of water of the Black Sea by reducing point and non-point sources of pollution and promote biogas as an alternative source of energy. The project development objectives for the GEF component are to: (i) take steps to protect the quality of water of the Black Sea from non-point sources of pollution by promoting improved agricultural practices, such as the use of reduced tillage, crop diversification and rotation, manure and chemical fertilizer and pesticide management systems, terracing, contour farming and buffer strips; and (ii) promote the use of bio-digesters as an alternate source of energy, thus reducing the venting of methane (CH₄) to the atmosphere from the anaerobic decomposition of animal waste and substituting this renewable energy for fossil fuels such as LPG and non-sustainable fuelwood. GEF funding will help remove institutional, financial and knowledge barriers, which currently act as disincentives to the adoption of environmentally sustainable agricultural practices and clean energy sources by farmers and the rural population, respectively. The GEF Alternative intends to achieve this at a total incremental cost of about US\$2.50 million. In addition an estimated US\$ 0.65 will be financed by the Government of Georgia and/or by the individual beneficiaries.

Context and Development Goals

2. Georgia is a mountainous country, with diversity in climate, soils, crop and livestock production systems. According to 1997 statistics, the total land area of Georgia is 6.97 million hectares of which about 3 million hectares are agricultural land. In addition, a little more than 3 million hectares are under forest and woodland. Georgia is divided into two main watersheds -- western and eastern -- with almost all major rivers originating in the central mountain ridge, an area marked by glaciers and numerous small mountain lakes. The average annual rainfall varies from 2000 to 4000 mm in the western watershed and 400 to 500 mm in the eastern watershed. The western watershed, covering an area of nearly 3.27 million hectares results in average runoff of about 41 billion cubic meters which drains into Black Sea. The eastern watershed covering an area of nearly 3.73 million ha results in an average runoff of about 12.7 billion cubic meters which drains into Azerbaijan and then eventually into Caspian Sea.

3. Agriculture is the main sector of Georgian economy, accounting for 28% of GDP and as much as 55% of employment in 1997. During Soviet times, agriculture and livestock production systems were highly intensified in Georgia to meet the food and fiber needs of the Soviet republics. Agricultural production systems were unsustainable – absence of conservation tillage and crop rotation and diversification, excessive use of and improper storage of mineral fertilizers and pesticides, etc. Such farming practices caused soil erosion and the movement of fertilizers and pesticides to rivers that resulted in increased Black Sea pollution. Also, animal production systems, especially swine and poultry, were highly industrialized (i.e. too many pigs and poultry at one concentrated location) resulting in large amounts of manure draining into major water bodies that fed into the Black Sea.

4. Since independence in 1991, the broad development goals of Georgia focus on public sector restructuring; private sector development; social protection and poverty reduction; and environmental protection. The Government's overall development agenda attempts to focus on these issues consolidating the stabilization recently achieved, strengthening the current economic recovery while protecting the environment. The Government of Georgia has taken important steps toward improved environmental management in recent years, including the "Environment Protection Law", the "Law on Environmental Permits", and the "Law on State Ecological Expertise". A National Environment Action Plan (NEAP) is under consideration for formal adoption by the Government. Recognizing the importance of protecting the waters of the Black Sea, Georgia signed and ratified the Bucharest Convention for the Protection of the Black Sea Against Pollution (1992) and signed the Odessa Ministerial Declaration (1993). Further, the government of Georgia collaborated with other Black Sea coastal countries, and developed the Black Sea Strategic Action Plan. Under this plan, Georgia agrees to reduce nutrient loads into the Black Sea by adopting environmentally friendly agricultural practices and thus preserve the country's rich biological diversity and natural resource base for future generations.

5. In addition, Georgia ratified the Framework Convention on Climate Change in July 1994. Its National Communication under the UN Framework Convention on Climate Change is currently being prepared. The document will analyze the potential measures to reduce GHG emissions and to adapt to climate change. Georgia is currently preparing an inventory of GHG emissions and is making vulnerability assessments for the Black Sea coastal zone. Preliminary investigations into the agriculture sector reveal the use of fertilizer as an activity of serious concern, and recommends improved land cultivation technologies, including irrigation.

Baseline Scenario

6. The baseline scenario includes various activities under this project, but without GEF support. Currently large amounts of manure and slurry are not stored or used and find their way into surface and groundwater sources. This may result in non-point source pollution from increased agricultural activity in Georgia, contributing significant and excessive loads of nutrients into the Black Sea that may lead to widespread eutrophication with the ecological damage and economic losses associated with this process. The long-term implication will be continued degradation of a globally significant

element of international waters and its associated bio-diversity in the shared coastal and marine environment of the Black Sea. As an alternative, more effective storage systems and treatments could be introduced. This should result in a significant reduction of water pollution and the increase in agricultural productivity through the application of organic fertilizers.

7. At present, the rural population uses a mixture of wood, fossil fuels or electricity derived from fossil fuels to meet their energy needs. All the fossil fuel energy and some of the fuelwood are from non-renewable sources. Thus they are adding to greenhouse gas accumulation and in the case of excessive fuelwood use, contributing to deforestation. The cost of this energy ranges from US\$ 590 per tonne for LPG to US\$ 22 per tonne for purchased fuelwood. Annual energy expenditure per farming family varies from about US\$ 250 to US\$ 400. In addition another US\$ 50 is saved by burning self-collected wood and other biomass.

8. Since transition, forest clearing has accelerated to provide more farmland and to meet the needs for building, farming operations and domestic energy purposes. This has led to the accompanying consequences of excessive carbon emissions, deforestation, and loss of natural habitat, to name a few. The Baseline Scenario does not include an effective mechanism to address this issue. Biogas could be a cost-effective and environmentally friendly addition to the current fuel mix. However, its widespread use is hampered by a number of barriers, including behavioral adjustments (inadequate manure handling), technological risks ((performance of digesters in cold weather), lack of familiarity, lack of capacity for service and maintenance and lack of investment capital.

9. **Costs.** Total expenditures under the Baseline Scenario are estimated at US\$ 5.55 million, including US\$ 0.65 from the Government of Georgia and participating farmers.

Global Environmental Objective

10. The global environmental objective of the project is to demonstrate the application of on-farm agricultural practices to reduce nutrient loads entering the Black Sea and help decrease GHG emissions over time. The dissemination and outreach features of the project will contribute to its replicability. The role of GEF in this project is to reduce farmers' perceived risks in adopting environmentally friendly on-farm agriculture practices and remove barriers for their adoption. It would demonstrate that farmers, who adopt these measures, are able to get the most beneficial use out of their lands and minimize negative impacts on the environment while improving the health of the Black Sea ecosystem. Finally, activities promoted under the GEF Alternative will facilitate the sharing of experiences in the search for feasible and affordable solutions to deal with non-point source pollution from agriculture to international water bodies.

11. **Scope.** The GEF Alternative would provide the means (above and beyond the Baseline Scenario) for meeting the proposed project's goals. Specifically, it will: (i) install and promote manure storage and handling tanks in villages for efficient manure management; (ii) provide manure spreaders/applicators for efficient and cost-effective use of manure and biogas slurry on

croplands; (iii) promote use of bio-digesters in the villages to reduce methane emissions into the atmosphere and to provide biogas for cooking and other domestic use; (iv) conduct on-farm trials and demonstrations to promote the use of improved sustainable agricultural practices, including reduced tillage, better chemical management systems, terracing, contour farming and buffer strips for water quality benefits; and (v) establish a water quality monitoring program.

12. **Costs.** The total cost of the GEF Alternative is estimated at **US\$ 8.05 million** detailed as follows: (i) Component 1: Competitive Grant Schemes -- US\$ 3.75 million (same as baseline); (ii) Component 2: Support for Reform of Agricultural Research, Extension and Training; – US\$ 1.15 million (same as baseline); (iii) Component 3: Improved Agricultural Practices to Reduce Environmental Pollution – US\$ 2.80 million (GEF financing – US\$ 2.35 million) and (iv) Project Implementation Unit – US\$ 0.35 million (GEF financing – US\$ 0.15 million).

Benefits

13. ***Domestic and International Benefits.*** The GEF Alternative would go beyond the Baseline Scenario by allowing the project to promote environmentally friendly agricultural and rural practices that will reduce non-point sources of pollution to the Black Sea as well as lessen carbon emissions into the atmosphere; these have strong implications for global climate and human health. Given the country's precarious budgetary situation, the government can ill-afford to spend scarce funds as financial incentives to farmers to reduce nutrient loads into the Black Sea for regional and global gains, nor invest in promoting biogas as an alternative source of clean energy for global gains. GEF funds will allow additional investments in sustainable farm management practices in selected project areas that have an impact on the Black Sea and provide willing farmers with an alternate source of renewable energy. Under the GEF Alternative, the promotion of improved sustainable agricultural practices will provide greater environmental benefits and augment the demonstration potential of the exercise. It will promote a public awareness program to effectively explain the benefits of improved environmental practices at farm level. It will also allow the development of a strategy for replication of the project within Georgia and internationally.

14. Currently, it has been estimated that there are about 100,000 farms in Georgia for which biogas could be potentially attractive. These digesters would supply an alternative renewable energy, while at the same time prevent the venting of methane and other greenhouse gases to the atmosphere. The proposed project should bring the technology to a point where a large-scale commercial demonstration is feasible. Assuming project success such a demonstration could be included under phase II of the ADP2 program possibly and if necessary with GEF support. (The details of such a follow-up project, including the appropriate GEF contribution and financing modality would be presented to GEF as a separate project).

15. The adoption of the biogas technology would result in two kinds of GHG saving. The first would be the prevention of methane being vented to the atmosphere. At full production, each digester would prevent nearly 600 kg of methane being vented each year. This is equal to 12.34

tonnes of carbon dioxide equivalent. Over the 20-year lifetime of the digester, about 250 tonnes of CO₂ equivalent would be saved from being venting, (Appendix 1). If production dropped by 50% during the six cool months of the year, then the savings over the 20-year lifetime would be about 190 t. of CO₂ equivalent.

16. The second GHG saving would be the substitution of a GHG neutral fuel (biogas) for a fossil fuel and/or non-renewable fuelwood. If it is assumed that half the biogas would replace LPG for cooking and half would replace wood, both for cooking and heating etc., then every year, the biogas from each digester would replace about 300 kg of LPG and 1,420 kg of wood. Most of this wood is renewable. However, an estimated 10% is obtained by reducing the tree capital. Thus, at full production, by substituting biogas, the yearly prevention of GHG emissions is an estimated 1,070 kg CO₂ equivalent per digester, or a saving of 21.4 t. of CO₂ over the 20-year lifetime of the digester, (Appendix 2). Again, if biogas production dropped by 50% for half of the year, then the savings would be reduced to an estimated 16 t. of CO₂ equivalent over the 20-year lifetime of the digester.

17. The farmers are interested in saving money from adopting this new technology. Only if they are using fossil fuels and/or electricity to cook with will it be profitable for them to switch to biogas digesters, although from a global environmental perspective it should be advantageous even if fuelwood is the principal household fuel. If biogas substitutes for 50% LPG and 50% wood, then at full production, the net annual savings, including depreciation on capital, should range from US\$ 70 to 100 per household. At full production, the net discount revenue (NDR) at 12% discount rate should be between US\$ 388 and 688 over the lifetime of the digester. If output drops by 50% during the six “winter” months, then the NDR will range from US\$ - 14 to 286, (Appendix 3). The above calculations assume that a 3.5 m³ digester will cost from US\$ 500 to 800, with an annual maintenance cost of US\$ 52. To achieve large-scale adoption, it may be necessary to have a loan program.

18. Assuming that some 50% (50,000) of the potential farming households adopt the new technology after phase II, this could result in the annual saving of 617,000 t. CO₂ equivalent at full production from not venting methane, or 12.34 million t. CO₂ equivalent over the 20-year lifetime of digesters. The savings of GHG emissions from substituting biogas for cooking and heating fuels will vary according to the type and mix of fuels. If it is assumed that half the biogas is substituted for LPG, kerosene or electricity (generated from heavy oil) and half is substituted for wood, of which 10% is non-sustainable, then the annual saving of CO₂ emissions for 50,000 units at full production will range from 53,500 tonnes (LPG/wood mixture), through 127,500 tonnes (kerosene/wood), to 151,500 tonnes (electricity/wood mixture). If biogas is substituted for wood alone (90% sustainable), then the annual saving of CO₂ emissions will only be an estimated 34,500 tonnes, (Appendix 4). At full production, the estimated yearly saving of fuel per digester by substituting biogas will be 303 kg of LPG or 909 liters of kerosene or 3.54 MWhr of electricity plus 1.42 tonnes of wood. If wood is the only fuel then the savings will be about 4.40 t. of wood, but only an estimated 10% of this total is non-sustainable (Appendix 2).

19. The greatest global savings from reducing GHG emissions come from preventing the venting of methane, with the substitution of renewable biogas for non-renewable fuels playing a modest role. If wood is the only fuel to be substituted by biogas, then the saving over the 20 year lifetime is an estimated 13.0 million tonnes of CO₂ equivalent, for the 50,000 digesters, of which 95% are from preventing methane venting. If biogas is substituted for an electricity/wood mix, then the saving is 15.4 million tonnes of CO₂ equivalent, of which 80% are from preventing methane venting. This points to the importance of capturing the methane and using it for energy once it has been captured (Appendix 4).

Incremental Costs

20. The difference between the cost of the Baseline Scenario US\$ 5.55 million and the cost of the GEF Alternative US\$ 8.05 million is estimated at US\$ 2.50 million and will be financed by GEF. This sum represents the incremental cost of achieving the global environmental benefits of reduced degradation of international waters and carbon emissions into the atmosphere. It is difficult to directly value the benefits derived from improving the quality of the international waters, but a rough estimate can be made of the benefits from capturing and using methane.

21. The proposed incremental cost of the biogas digester initiative is US\$ 0.85 million. Demonstration units will be built to test the practicability of biogas production in conditions with wide ranging variations in temperature. Insulated and non-insulated, heated and non-heated digesters may be tested to determine the most appropriate and cost effective models. Surveys will have to be undertaken to determine potential farmers; masons will have to be trained, as will the prospective digester owners. An organization should be established to undertake survey work, promotion, management, training and extension. Such an organization must monitor the quality of the units, undertake research and development and provide institutional support. Some of this should come in phase II if the preliminary trials are successful.

22. However, from a farmer's viewpoint each biogas unit should not be more than US\$ 800 if it is to be a worthwhile investment. With R & D it may be possible to reduce the cost of an average digester to about US\$ 500. It is proposed to build up to 150 demonstration units during this first phase for an estimated cost of US\$ 120,000. Without the digester, the farmer would spend on average about US\$ 194 per year for LPG and wood and with the digester, the annual net savings will be about US\$ 83, including depreciation. Thus over the 20-year digester's lifetime, the total savings on 150 units will be about US\$ 0.25 million: this is taken as the baseline cost.

23. Over the 20-year lifetime, the 150 demonstration digesters should save the equivalent of between 30,000 and 40,000 tonnes of CO₂ equivalent, depending on the efficiency of production under variable temperatures. Thus, the cost per tonne of CO₂ saved ranges from US\$ 3 to 4 based on the cost of the digesters alone, to US\$ 21 to 28 based on the total incremental costs. If successful, this could lead to a GHG saving of between 11 to 14 million tonnes of CO₂ for 50,000

units with a net saving for the farmer of between US\$ 8 and 28 million. Table 1 gives the incremental cost matrix for this component as well as all the proposed GEF interventions.

Table 1. Georgia: Agricultural Development Project-II. Incremental Cost Matrix

Component	Cost Category	US\$ Million	Domestic Benefit	Global Benefits	
				International Water	Climate Change
1. Competitive Grant Scheme	Baseline	3.75	Improved local capacity and knowledge to respond to the demands of emerging private farmers for technology innovation.	Reduced nutrient loads into the Black Sea by making available environmentally sustainable agricultural technologies.	
	With GEF	3.75	Same as above.	Same as above.	
	Incremental	0.00			
2. Reform of the Agricultural Research, Education and Extension System	Baseline	1.15	Strengthened policy and structural framework for agricultural research, education and extension.	Reduced nutrient loads by improving extension and research services.	
	With GEF	1.15	Same as above.	Same as above.	
	Incremental	0.00			
3.a Improve Agricultural Practices to Reduce Pollution - On-farm Trials and Demonstration of sustainable agricultural practices, such as reduced tillage, manure handling systems, etc.	Baseline ^a	0.20			

	With GEF (IW).	1.35	Improved land-use practices and water quality. Reduced soil erosion. Increased financial profitability of agriculture production. Increased rural incomes.	Reduction of nutrient loads into the Black Sea to guard against eutrophication and protect natural habitat. Enhanced possibilities for technology transfer between riparian countries.	Increased carbon sequestration, (above and below ground).
	Incremental	1.15			
3.b Improve Agricultural Practices to Reduce Pollution – Biogas Units.	Baseline ^{b,c}	0.25	Energy provided by wood and imported LPG etc.	Increased nutrient loads into the Black Sea	GHG emissions of about 500 t. C/yr.
	With GEF (CC).	1.10	Improved nutrient management and protection of the environment. Reduced pressure on forest. Reduced reliance on imported fossil fuels. Reduced rural health hazards.	Reduction of nutrient loads in the Black Sea. Enhanced possibilities for technology transfer between riparian countries.	Reduction of GHG agricultural emissions and substituting biogas for fossil fuels with a saving of 500 t. C/yr. Potential of 50,000 units with a saving of 167,000 t. C/yr.
	Incremental	0.85			
3.c Improve Agricultural Practices to Reduce Pollution - Water Quality Monitoring.	Baseline	0.00			GHG emissions.
	With GEF ^d (IW).	0.35	Improved national and regional monitoring capabilities.	Enhanced credibility of riparian countries on environmental benefits of agricultural practices to reduce nutrient loads.	Decrease venting of methane, thus reduce GHG emissions.
	Incremental	0.35			

4. Project Implementation Unit.	Baseline	0.20	Increased capacity for project management and project successfully implemented.		
	With GEF	0.55	Same as above.	Enhanced GHG mitigation	GHG mitigation.
	Incremental	0.35			
Total.	Baseline	5.75	Without project; very slow improvements in nutrient control and reduction of GHG emissions.		
	With GEF	8.25	With project; rapid improvement in nutrient control and reduction of GHG emissions.	Above benefits.	Above benefits.
	Incremental	2.50			

Notes:

- Participant farmers in trial demonstration schemes will contribute about 15 percent of the investment cost (in kind contribution) in the on-farm sustainable agricultural practice trials.
- The option to be adopted without the project consists in continuing methane venting, using fossil fuels and deforestation.
- Participant farmers will contribute about 23 percent of the investment and maintenance costs of the biogas plants.
- The project will cover 100 percent of the investment cost in establishing a water quality monitoring system.

Attachment 1.
Saving of GHG from the Non-Venting of Methane.

The proposed GEF biogas initiative will collect methane produced when manure and other biomass decomposes anaerobically. Biogas digesters of about 8 m³ capacity of which 2 m³ are for gas collection will be built to determine the practicability of collecting the methane from the decomposition of manure etc. in the absence of air. The daily input of fresh manure is an estimated 60 kg from 10 large animals mixed with about 40 kg of water. The estimated retention time for this mixture is 60 days. At full production the daily production of the digester will be 3.5 m³ of biogas containing 60% methane, with an energy value of 23 MJ per m³. This is equivalent to 1.61 kg of methane, (energy value 50 MJ/kg). Therefore, the yearly production is equal to 558 kg of CH₄. If production is halved during the 6-month “winter” period, then the estimated output will be about 440 kg of CH₄, (75% rated capacity).

If methane is vented to the atmosphere, it has a GHG forcing effect 21 times greater than carbon dioxide over a 100-year time period. Thus, if the methane from the digester was vented to the atmosphere, it is equivalent to an annual production of 12.34 tonnes of CO₂ at full production or 9.26 t. CO₂ at 75% rated capacity.

The anticipated lifetime of a digester is 20 years. If the methane from the digester is captured and flared, then the saving of GHG emissions over the 20-year period would be about 247 t. of CO₂ equivalent at full capacity and 185 t. CO₂ equivalent at 75% rated capacity. There will be a further saving of GHG emissions if the biogas is used for energy in place of fossil fuels or non-renewable biomass energy.

The potential for biogas digesters has been estimated to be 100,000 units. If half the potential can be achieved, then the estimated saving of GHG from not venting methane to the atmosphere is 12.34 million tonnes of CO₂ equivalent over a 20-year period at full production, or 9.26 million tonnes CO₂ equivalent at 75% rated capacity.

Attachment 2. Estimated Saving of GHG from Substituting Biogas for Fossil Fuels & Wood.

The daily consumption of biogas for cooking for a family of four to five is estimated to be between 1.7 and 2.1 m³. It is reported that many rural households use fossil fuels or electricity for cooking together with wood for heating purposes and some wood for cooking. Therefore, it is assumed that half of the daily 3.5 m³ output from the average digester will substitute for fossil fuels or electricity and half will substitute for fuelwood. It is further assumed that 2.1 m³ of biogas are used for cooking and that the remaining 1.4 m³ are used for heating purposes and substitutes only for wood. The following end-use efficiencies and energy values are assumed.

Efficiency for Cooking. Biogas, 65%; Wood, 20%; Kerosene, 35%; LPG, 70%; Electricity, 75%.

Efficiency for Heating. Biogas, 90%; Wood, 80%.

Energy values. Biogas, 23 MJ/m³; Wood, 16 MJ/kg; Kerosene, 35 MJ/liter; LPG 45 MJ/kg; Electricity, 3.6 MJ/kWhr.

The price of the various fuels in US\$ is as follows:

Purchase price. Kerosene, \$ 185/m³; LPG, \$ 593/tonne; Electricity, \$ 45/MWhr; Wood, \$ 22/tonne. However, only an estimated 45% of wood is purchased in rural areas, the rest being self-collected: thus, the average price is \$ 10/tonne consumed. Most of this wood is renewable, but it is assumed that 10% is from non-renewable sources

Annual substitution of biogas per digester for the various fuels with their cost.

Operation	Biogas	Kerosene	LPG	Electricity	Wood
	m ³	liter (\$)	kg. (\$)	kWhr. (\$)	kg. (\$)
Cooking	639	909 (168)	303 (180)	3,540 (159)	2,984 (30)
Wood (kg.)					
Cooking	128	599	599	599	599
Heating	511	825	825	825	825
Sub-total	639	1,424 (14)	1,424 (14)	1,424 (14)	1,424 (14)

Note. Annual production of biogas per digester is 1,278 m³. It is assumed that half of the biogas production is substituted for a cooking fuel and the other half for wood. This half is used for heating, warming water and a little cooking.

Emission of CO₂ for specific fuels,

CO₂ emissions, (kg CO₂ per unit of fuel). Wood, 1.56/kg; Kerosene, 2.57/liter; LPG, 2.81/kg; Electricity from fossil fuel, 0.792/kWhr.

Annual GHG emissions of substitute fuels per 1,278 m³ of biogas.

Operation	Biogas	Kero./wood	LPG/wood	Elec./wood	Wood
units: kilogram of CO ₂ equivalent.					
Cooking fuel	0	2,333	850	2,805	465
Cook/heat (wood)	0	220	220	220	220
GHG emissions for combination of fuels					
Annual total (kg)	0	2,553	1,070	3,025	685
20-year total (t.)	0	51.06	21.40	60.50	13.70

Source. The World Bank Environment Dept. 1998. Greenhouse Gas Assessment Handbook, Paper No. 064. The World Bank Washington. The World Bank Georgia Office 1998. Woodfuel in Georgian Households. The World Bank Georgia.

**Attachment 3.
Costs and Benefits of a Biogas Plant.**

Biogas Plant. Daily production - 3.5 m³.

Capital cost.	US\$ 500 to 800.			
Annual capital depreciation.	US\$ 45 to 72.			
Annual operation and maintenance cost.	US\$ 52.			
Annual savings on specific fuel mixes.	US\$			
	Wood & Kerosene. LPG. Electricity. Wood.			
At full capacity (1278 m ³ biogas/yr.)	182	194	173	44
Net annual savings (digester \$ 500).	85	97	76	- 53
Net annual savings (digester \$ 800).	58	70	49	- 80
At 75% rated capacity (958 m ³ /yr.)	137	146	130	33
Net annual savings (digester \$ 500).	40	49	33	- 64
Net annual savings (digester \$ 800).	13	22	6	- 91

Net Discounted Revenue.

units US\$ (discounted at 12% for 20 years)

	Kerosene/wood	LPG/wood	Electricity/wood	Wood
Discounted expenditure	500 800	500 800	500 800	500 800
Full capacity (1,278 m ³ biogas per year)				
Discounted income	1088	1188	1012	- 67
Net discounted revenue	588 288	688 388	512 212	- 567 - 867
At 75% rated capacity (958 m ³ biogas per year)				
Discounted income	711	786	653	- 159
Net discounted revenue	211 - 89	286 - 14	153 - 147	- 659 - 959

Note. 12% discount factor for 20 years is 8.366 (year 0 = 1, years 1 to 19 = 7.366).

Only annual O & M cost of US\$ 52 included, annual depreciation excluded.

Attachment 4.
Saving of GHG Emissions by Substituting Biogas for Various Fuels.

Saving of GHG by not venting methane.

	Full capacity	75% rated capacity (t. CO ₂ equivalent)
Annual saving per digester,	12.34	9.26
Lifetime saving (20 years)	247	185
Annual saving for 50,000 units.	617,000	462,750
Lifetime saving for 50,000 units.	12,340,000	9,260,000

Saving of GHG by substituting biogas for various fuels.

	units. t. CO ₂ equivalent.			
	Kero./wood	LPG/wood	Elec./wood	Wood
At full capacity				
Annual saving	2.55	1.07	3.03	0.69
Lifetime saving	51.06	21.40	60.50	13.70
Annual saving; 50,000 units	127,500	53,500	151,500	34,500
Lifetime saving; 50,000 units	2,553,000	1,070,000	3,025,000	685,000
Lifetime saving including not venting methane	14,893,000	13,410,000	15,365,000	13,025,000
At 75% rated capacity				
Annual saving	1.91	0.80	2.27	0.52
Lifetime saving	38.25	16.05	45.45	10.35
Annual saving; 50,000 units	95,500	40,000	113,500	26,000
Lifetime saving; 50,000 units	1,912,500	802,500	2,272,500	517,500
Lifetime saving including not venting methane	11,172,500	10,062,500	11,532,500	9,777,500

A Technical Review of WB/GEF proposal on
Georgia Agricultural Development Project - II

1. Overall Impressions:

This is an ambitious proposal. The objectives of the proposal address significant barriers to improved productivity, environmental sustainability and economic viability of the Georgian agricultural sector. The topics addressed in the proposal range from agricultural technology research and extension to the development of an efficient and responsive agricultural knowledge and information system for Georgia. An important goal of the project is to reduce non-point source pollution of the Black Sea.

2. Relevance & Priority

The objectives of the project are relevant to the goals of GEF. The project should be accorded a high priority.

3. Background and Justification

The project document provides adequate background and justification for the proposed work.

4. Scientific and Technical Soundness

Except for the case made for biogas digesters, the project presentation is scientifically and technically sound.

For the case of biogas digesters, the project documents do not present some important relevant information: the main inputs to the biogas digesters are farm animal dung. The amount of dung collected is strongly dependent on whether the farm animals are stall-fed or more-or-less free ranging. In the latter case, much of the dung is deposited in the fields, and is labor-intensive to collect. It is not clear from the project documents what (if any) is the present collection method and the efficiency of cattle and pig dung on Georgian farms. Also, the present disposal methods for cattle and pig dung is not described. This is relevant for understanding how the current methods (or lack thereof) contribute to the pollution of water resources, and how biogas digesters may reduce such pollution.

While biogas digesters can be possibly justified as a development of a renewable energy source, its link to reduced pollution of the water resource requires stronger justification. One would want data on indicators (e.g., E. Coli counts per deciliter) or other research pointing to water contamination from improper disposal of farm animal dung to support the argument that biogas digesters will reduce water pollution. The project documents do explain that the availability of data on water pollution and pollution characterization by source is poor. Nevertheless, data are required to support the claim that improper methods of disposal of farm animal dung are a significant contributory cause of water pollution in Georgia rivers and the Black Sea.

There are two other problems related to the sections on biogas digesters. (1) In the incremental cost analysis, credit is taken for preventing venting of methane when biogas digesters are used to produce biogas as fuel for cooking and heating. This pre-supposes that the present dung disposal method leads to anaerobic decomposition of dung and atmospheric release of methane. This supposition need to be supported with data. In the common scenario of dung deposited in the fields, it decomposes aerobically on land surface. In that case, the common product of aerobic decomposition is CO₂. If the present (presumably inadequate) disposal methods for animal dung lead to aerobic decomposition of the dung as is commonly the case, then the calculations of avoided green house gas impacts are flawed, and need to be revised.

(2) the cookstove efficiencies cited in Appendix 2 of the Incremental Cost Analysis appear to be a bit high for wood (should use 15% rather than 20%), LPG (55% rather than 75%), and electric stoves (65% rather than 75%), and too low for Kerosene (use 45% for Kerosene wick, and 55% for Kerosene pressure stoves, as against the assumed 35%).

5. Objectives

The project objectives are well thought out, valid and acceptable.

6. Activities

The project proposes several specific activities towards its objectives.

(1) a Competitive Grants Scheme to support agricultural technology validation and dissemination, (2) support for reform of agricultural research, education and extension systems, (3) support for improved agricultural practices to reduce environmental pollution, and (4) formation of a project implementation unit to execute and manage the project.

7. Participatory Aspects

The proposal is well thought out, and provides a solid basis for participation from the private sector, relevant government agencies, and NGOs in program activities.

8. Global Benefits

Global environmental benefits are adequately identified, However, their quantification may need revision as described in section 4 above.

9. GEF Strategies and Plans

Project is consistent with GEF strategies and plans.

10. Replicability

The project will be certainly replicable in other countries if successful.

11. Capacity Building

The project will build substantial capacity in a range of institutions in Georgia.

12. Project Funding

The proposed level of funding is appropriate for activities proposed.

13. Time Frame

Time frame for the project is achievable.

14. Secondary Issues

Some editorial effort may improve the readability of the text.

15. Additional Comments

The project document demonstrates familiarity with the various barriers to agricultural reforms both in terms of technology adaptation and information and knowledge systems to support it. Agricultural reform, even technical one, is never simple. However, the proposal offers a comprehensive approach to support such reform institutionally, with strengthened knowledge systems, and appropriate information dissemination and technology demonstration.

**TECHNICAL REVIEW
GEORGIA ADP2 (OP 8)
PROJECT PROPOSAL TO GEF**

The project is scientifically sound. It is based on the application of principles which have been well developed in other and comparable environments and should now be developed to apply to the agricultural practices in Georgia catchments draining into the Black Sea.

The project brings together the benefits of increased agricultural productivity and links these to methods which reduce the pollution burdens to the atmosphere and to water courses. The project is technically sound but in its development and implementation it will be important to link the economic and environmental benefits and issues as part of a combined double package. If this is not done there is a risk that the projects submitted under the Competitive Grant Scheme will be overwhelmingly focussed on the aspects of increased productivity and will attach much less importance to the environmental aspects.

There are clear global and environmental benefits in the project if it is completed successfully. It relates to managing and reducing land based sources of marine pollution and this is particularly important in the context of the Black Sea. There would however be drawbacks if the increased agricultural productivity components are funded without an equal or greater take-up of the broader environmental and pollution reduction elements of the project.

The project fits in with the broad range of goals of the global environment facility. In particular, the water quality elements relate to international waters through the drainage from the catchments of Georgia into the Black Sea. It relates to the global programs on land-based sources of marine pollution. It has clear linkages to programs relation to biological diversity and broader conservation issues.

The regional context is particularly significant, since the project relates to catchments draining into the Black Sea which is surrounded by countries in critical stages of economic development and with consequent risks of high and increasing levels of pollution to the vulnerable inland sea.

The project has a high potential for replicability. It is itself, a form of replication of earlier projects relating to similar situations in Poland and Macedonia. The issues of introduction of low tillage, low sediment loss, agriculture and consequent significant reductions of pollution of water courses and receiving marine waters have a general applicability to the agricultural coastlines of much of the developing world.

The project concerns the introduction of practices and technologies which should provide economic and ecological benefits which will thus be valued and sustained by the communities which adopt them. There is consequently, a high likelihood of sustainability.

The research elements of the project are important in the context of improving global knowledge and understanding of concepts of holistic management of catchments and water quality. The linked elements which will be needed for the success of this project relate to the means of translating the research information about the science and the technologies of cleaner agricultural practice into extension and education programs which speak directly and easily to the farmers who will be the front line in the application of these technologies.

I do not have sufficient knowledge of the range of programs and action plans in the relevant regional and sub-regional areas.

The issue of beneficial or damaging environmental effects has been covered in my comments on the scientific and technical aspects of the project.

The degree of involvement of stakeholders in the project is a core element of the project designed and the basic design appears to me to make solid provision for stakeholders' involvement.

In a similar way, the development of capacity and expertise for the practitioners or stakeholders is a core element of the project.

The project is innovative in the context of Georgia and the development of Georgian agriculture but as mentioned above, it represents the intelligent application of lessons learned from precedents in Poland and Macedonia.

In relation to the risks of the project, the table on page 22 provides a reasonable coverage. The risk of farmers being less willing to accept improved environmental friendly agricultural practices has not been rated in the table. I would assign S for substantial to this risk. My experience suggests that the natural conservatism of farmers who are struggling economically is likely to make them willing to accept practices which improve their productivity and economic issue and to be less inclined to apply effort to adopt economy neutral practices which are nevertheless highly beneficial in environmental terms. I believe the project has the capacity to address this risk. I think it needs to be expressed very directly and the development of the design needs to develop clear practices to ensure that the extension to the agricultural community is well designed and well resourced.

An element which the designers may care to consider is to build in a sub- regional award scheme so that the farmers who do take up the measures can gain a degree of social or community recognition for good performance in activities which improve the qualities of land and water.

SUMMARY

I consider that the project is valuable and addresses a particularly important combination of economic and ecological matters, which have to be addressed together if the issues of land based marine pollution originating from agriculture are to be addressed effectively.

In finalising the design and implementation, I would advocate to the team that there be a more obvious linkage of the ecological to the economic and productivity elements of the research and technology development, so that the intended combination of good economic and good ecological practices is emphasised and forms a basis of continuing practice. It is particularly important that a culturally appropriate extension and farmer education scheme is very specifically incorporated into the design and operation of this project.

Subject to those concerns, I reiterate that the project is important in addressing an important combination of issues for a global region which is particularly vulnerable to the effects of land sourced marine pollution and I would advocate its support.

Ashok Gadgil, OP6- R.A. Kenchington (International Waters)

Agricultural Development Project - II

Response to STAP Reviewers Comments

Comment on the International Waters Component

According to the STAP reviewer “the project is valuable and addresses a particularly important combination of economic and ecologically matters, which have to be addressed together if the issues of land based marine pollution originating from agriculture are be addressed”. The STAP also has endorsed the Project subject to the following:

(a) development of the design needs to develop clear practices to ensure that the extension to the agricultural community is well designed and well resourced.

Response: The Project is designed to foster broad-based stakeholder participation, which will ensure that schemes developed are demand-driven and fully responsive to the needs of the end-users, namely the smaller and commercial farmers. The Project, as presently designed, also allows sufficient flexibility in the allocation of resources. The needs of each component would be reassessed during the mid-term review and resources reallocated, if justified.

(b) team develop the more obvious linkage of the ecological to the economic and productivity elements of the research and technology development, so that the intended combination of good economic and good ecological practices is emphasized and forms the basis of continuing practice.

Response: The components aimed at reducing non-point sources of pollution from agriculture and promoting the use of biogas were added to the Project with the specific intent of underscoring the need for an inter-sectoral approach to natural resource and environmental management. This together with the broad-based stakeholder participation is expected to lead to economic and ecological concerns being addressed in a holistic fashion.

Comments of the biogas component:

While acknowledging that the Project proposal “offers a comprehensive approach to support such reform institutionally, with strengthened knowledge systems, and appropriate information dissemination and technology demonstration, the STAP reviewer has raised the following issues:

(a) It is not clear from the project documents what (if any) is the present collection method and the efficiency of cattle and pig dung on Georgian farms.

Response: A study carried out under the auspices of GTZ has estimated that the potential market for biodigestors in Georgia is in the neighborhood of about 100,000, implying that the collection

method and efficiency is generally satisfactory for biogas use. However, during preparation, the findings of the study would be further validated through visits to selected sites.

(b) The present disposal method for cattle and pig dung is not described ---- relevant for understanding how the current methods contribute to pollution of water resources.

Response: According to the Black Sea Strategic Action Plan, non-point sources of pollution from agriculture, particularly the discharge of nutrients, is the key issue facing the Black Sea.

(c) while biogas digesters can be justified as a development of a renewable energy source, its link to reduced pollution of the water resources requires stronger justification.

Response: The link between promoting biodigesters and reducing pollution of water resources is indirect. In order to reduce pollution of water resources, manure would need to be better stored and applied. Stored manure, unless used, releases methane – a greenhouse gas. The use of biodigester is being promoted to reduce the emissions of this gas.

(d) credit is taken for preventing venting of methane when biogas digesters are used to produce biogas as fuel for cooking and heating.

Response: See response immediately above.

(e) the cook stove efficiencies appear to be a bit high for wood.

Response: The efficiency estimates are based on a study prepared for the Bank “Woodfuel in Georgian Households”. Also, if wood stoves in Georgia are similar to those in Albania, where rural households use cast iron stoves with chimney, the efficiency is likely to be higher than the presently estimated 20%. The estimates will be validated during preparation. In addition, the estimates used in the Incremental Cost Analysis are conservative; using other estimates would only improve the results.

GEORGIA

Agricultural Development Project - II

Response to STAP Reviewers Comments

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Response: A study carried out under the auspices of GTZ has estimated that the potential market for biodigestors in Georgia is in the neighborhood of about 100,000, implying that the collection method and efficiency is generally satisfactory for biogas use. However, during preparation, the findings of the study would be further validated through visits to selected sites.

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Response: See response immediately above.

(e) the cook stove efficiencies appear to be a bit high for wood.

Response: The efficiency estimates are based on a study prepared for the Bank “Woodfuel in Georgian Households”. Also, if wood stoves in Georgia are similar to those in Albania, where rural households use cast iron stoves with chimney, the efficiency is likely to be higher than the presently estimated 20%. The estimates will be validated during preparation. In addition, the estimates used in the Incremental Cost Analysis are conservative; using other estimates would only improve the results.

LETTER OF COUNTRY ENDORSEMENT
BY DESIGNATED OPERATIONAL FOCAL POINT



საქართველოს გარემოსა და ბუნებრივი
რესურსების დაცვის სამინისტრო
MINISTRY OF ENVIRONMENT OF GEORGIA

საქართველო 380015 თბილისი, 2 კოსტავას 68 ა. ტელ: 33-15-82. ფაქს: 98-34-25/94-36-70 .

68 a Kostava street, 380015 Tbilisi, Georgia, Tel: +995 32 331 582, Fax: +995 32 425/943 670

E-mail: gmoep@caucasus.net

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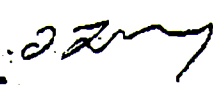
To Karin Shepardson ECSSD

Subject: Proposed Georgia Agriculture Development Project – GEF
Focal Point Endorsement Letter

Dear Karin,

We had a pleasure get known the proposed project "Agriculture Development for Georgia", which includes the component on environment impacts, which is seeking GEF funds and hereby we express our interest in this project.

Sincerely yours,


Merab Sharabidze,
Deputy Minister