Document of
The World Bank

Report No: ICR0000652

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(WBTF-50327)

ON A

GLOBAL ENVIRONMENT FACILITY TRUST FUND GRANT

IN THE AMOUNT OF SDR 4.0 MILLION
(US$ 5.15 MILLION EQUIVALENT)

TO THE

GOVERNMENT OF ROMANIA

FOR AN

AGRICULTURAL POLLUTION CONTROL PROJECT

December 28, 2007

Sustainable Development Sector Department
South Central Europe Country Management Unit
Europe And Central Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 28,2007)

Currency Unit = Romanian New Leu (RON)
RON 1.00 = US$ 0.42
US$ 1.00 = RON 2.39

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ANAR	National Water Authority
APC	Agricultural Pollution Control
APCP	Agricultural Pollution Control Project
ASSP	Agricultural Support Services Project
CAP	Common Agricultural Policy
CAS	Country Assistance Strategy
CE	Cost Effectiveness
CGS	Competitive Grant Scheme
CGAP	Code of Good Agricultural Practices
DGA	Directorate General of Agriculture
EMP	Environmental Management Plan
EPI	Environmental Protection Inspectorate
EPA	Environmental Protection Agency
EU	European Union
GAP	Good Agricultural Practices
GEF	Global Environment Facility
GEO	Global Environment Objective
GoR	Government of Romania
IBRD	International Bank for Reconstruction and Development
ICR	Implementation Completion and Results Report
INPCP	Integrated Nutrient Pollution Control Project
ISR	Implementation Supervision Report
M&E	Monitoring and Evaluation
MAFF	Ministry of Agriculture, Food and Forests
MARD	Ministry of Agriculture and Rural Development
MWEP	Ministry of Waters and Environmental Protection
MESD	Ministry of Environment and Sustainable Development
N	Nitrogen
ND	Nitrates Directive
NFA	National Forest Administration
NVZ	Nitrate Vulnerable Zone
O&M	Operations and Maintenance
P	Phosphorus
PAD	Project Appraisal Document
PIP	Project Implementation Plan
PMU	Project Management Unit
UNDP	United National Development Programme
USAID	United States Agency for International Development
US$	United States Dollars
WB	World Bank

Vice President:	Shigeo Katsu
Country Director:	Benoit Blarel (acting)
Sector Manager:	Juergen Voegele
Project Team Leader:	Doina Petrescu
ICR Team Leader	Tijen Arin

Romania
Agricultural Pollution Control Project

CONTENTS

A. Basic Information

Country:	Romania	Project Name:	Agricultural Pollution Control GEF Project
Project ID:	P066065	L/C/TF Number(s):	WBTF-50327
ICR Date:	12/28/2007	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	GOVERNMENT OF ROMANIA
Original Total Commitment:	USD 5.2M	Disbursed Amount:	USD 5.1M

Environmental Category: B **Global Focal Area: I**

Implementing Agencies:

Ministry of Environment and Water Management

Cofinanciers and Other External Partners:

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	12/16/1999	Effectiveness:	04/29/2002	04/29/2002
Appraisal:	07/19/2001	Restructuring(s):		
Approval:	12/13/2001	Mid-term Review:	04/30/2004	01/17/2005
		Closing:	06/30/2007	06/30/2007

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes:	Satisfactory
Risk to Global Environment Outcome	Moderate
Bank Performance:	Satisfactory
Borrower Performance:	Highly Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Satisfactory	Government:	Highly Satisfactory
Quality of Supervision:	Highly Satisfactory	Implementing Agency/Agencies:	Highly Satisfactory
Overall Bank Performance:	Satisfactory	**Overall Borrower Performance:**	Highly Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators

Implementation Performance	Indicators	QAG Assessments (if any)	Rating
Potential Problem Project	No	Quality at Entry	None

at any time (Yes/No):		(QEA):	
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
GEO rating before Closing/Inactive status	Highly Satisfactory		

D. Sector and Theme Codes

	Original	Actual
Sector Code (as % of **total** Bank financing)		
Agricultural extension and research	73	73
Central government administration	5	5
Forestry	9	9
General education sector	8	8
Sub-national government administration	5	5
Theme Code **(Primary/Secondary)**		
Environmental policies and institutions	Primary	Primary
Land administration and management	Secondary	Secondary
Other rural development	Primary	Primary
Pollution management and environmental health	Primary	Primary
Water resource management	Primary	Primary

E. Bank Staff

Positions	At ICR	At Approval
Vice President:	Shigeo Katsu	Johannes F. Linn
Country Director:	Benoit Paul Blarel	Andrew N. Vorkink
Sector Manager:	Juergen Voegele	Jane E. Holt
Project Team Leader:	Doina Petrescu	Jitendra P. Srivastava
ICR Team Leader:	Tijen Arin	
ICR Primary Author:		

F. Results Framework Analysis

Global Environment Objectives (GEO) and Key Indicators(as approved)

The objective of the Project is to increase the use of agricultural practices that benefit the environment and lead to reduced nutrient discharge from agricultural sources in Romania to the Danube River and the Black Sea.

Key Indicators:

(i) Percentage of households with livestock in project area adopting improved manure handling facilities - targeted to move from baseline of zero to 45% by 2006 and 65% by 2010;

(ii) Percentage cropped area coming under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manure - targeted to reach 30% by 2006 and 65% by 2010;

(iii) Percentage of cropped area employing environment-friendly practices - target of 65% by 2010; and

(iv) Trends in water quality indicators at designated sites - flow of nitrogen and phosphate to Danube River to be reduced by 10% by 2006.

Revised Global Environment Objectives (as approved by original approving authority) and Key Indicators and reasons/justifications

The GEO was not revised.

Indicator No.4 #Trends in water quality indicators at designated sites# was revised in the sense that it would not be measured in numerical values, but only in terms of direction (positive, neutral or negative). This was necessary as a numerically measured indicator would have necessitated a high-cost complex geo-hydrological model and intensive sampling while adding little to the attainment of the GEO.

(a) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Percentage of households with livestock in the project area using village manure storage, household bunkers and segregating waste materials			
Value (quantitative or Qualitative)	**0%**	**45%**		**54.4%**
Date achieved	**1213112002**	**1213112006**		**1213112006**
Comments (incl. % achievement)	* The actual value was ascertained in a survey carried out in early **2007**			
Indicator 2 :	Percentage of area under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manure			
Value	0%	30%		34%

(quantitative or Qualitative)			
Date achieved	1213112002	12/31/2006	12/31/2006
Comments (incl. % achievement)	* The actual value was ascertained in a survey carried out in early 2007		
Indicator 3 :	Percentage of area under enviornmentally-friendly agricultural practices		
Value (quantitative or Qualitative)	0%	30%	34%
Date achieved	12/3112002	1213112006	1213112006
Comments (incl. % achievement)	* The actual value was ascertained in a survey carried out in early 2007		
Indicator 4 :	Trends in water quality indicators at designated sites		
Value (quantitative or Qualitative)	0%	10%	*Positive
Date achieved	12/31/2002	12/31/2006	12/31/2006
Comments (incl. % achievement)	*Please see explanation above.		

(b) Intermediate Outcome **Indicator(s)**

Indicator	Baseline Value	**Original Target** Values (from approval **documents)**	**Formally Revised Target Values**	**Actual Value Achieved** at **Completion** or **Target Years**
Indicator 1 :	Number of village level manure storage facilities built finalized			
Value (quantitative or Qualitative)	0	14		18
Date achieved	12/31/2002	12/31/2006		06/30/2007
Comments (incl. % achievement)	Number of household manure bunkers built			
Indicator 2 :	Number of household manure bunkers built			
Value (quantitative or Qualitative)	0	4,000		2,250
Date achieved	12/31/2002	1213112006		12/05/2005
Comments (incl. % achievement)				
Indicator 3 :	Percentage of vulnerable terrace areas planted to trees			
Value	10%	100%		100%

(quantitative or Qualitative)				
Date achieved	12/31/2002	06/30/2007		06/30/2007
Comments (incl. % achievement)	The indicators presented here are those that were tracked in the ISR as they best gauge project progress.			

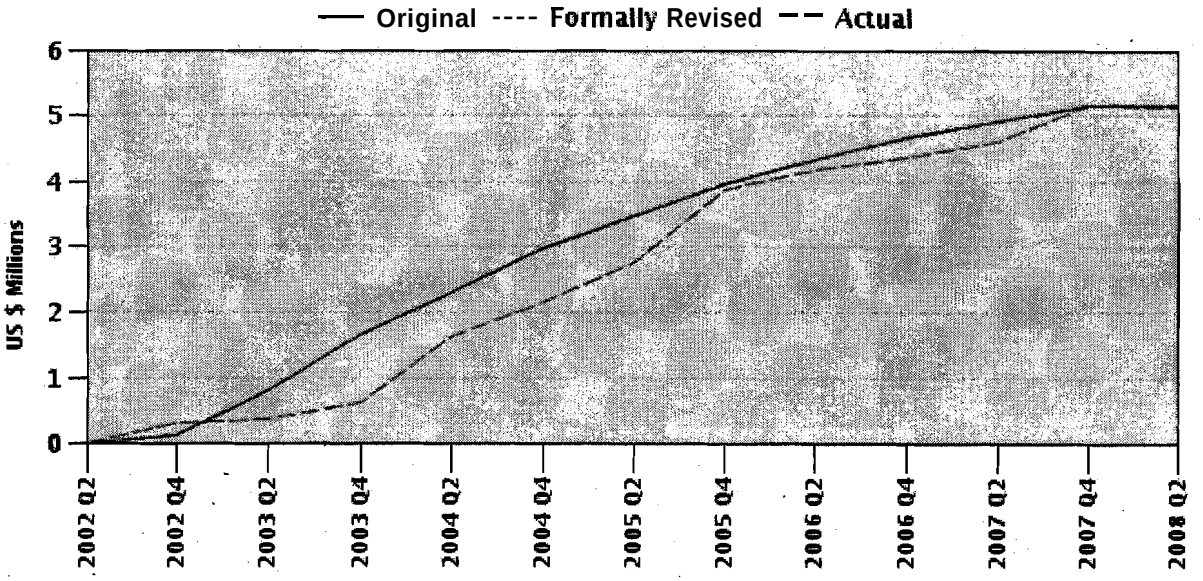
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	GEO	IP	Actual Disbursements (USD millions)
1	03/13/2002	Satisfactory	Satisfactory	0.00
2	05/17/2002	Satisfactory	Satisfactory	0.00
3	08/27/2002	Satisfactory	Satisfactory	0.30
4	03/05/2003	Satisfactory	Satisfactory	0.44
5	05/29/2003	Satisfactory	Satisfactory	0.46
6	12/01/2003	Satisfactory	Highly Satisfactory	1.21
7	06/28/2004	Satisfactory	Satisfactory	2.16
8	12/22/2004	Satisfactory	Satisfactory	2.77
9	03/14/2005	Satisfactory	Satisfactory	3.39
10	04/02/2005	Satisfactory	Satisfactory	3.39
11	12/12/2005	Satisfactory	Satisfactory	4.17
12	08/17/2006	Satisfactory	Satisfactory	4.36
13	01/23/2007	Highly Satisfactory	Highly Satisfactory	4.62
14	06/28/2007	Highly Satisfactory	Highly Satisfactory	5.15

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Global Environment Objectives and Design

1.1 Context at Appraisal

The project was designed as part of the GEF / WB regional Black Sea Danube Strategic Partnership – Nutrient Reduction Investment Fund. This Fund aims at reducing nutrient flows to the Danube River and ultimately the Black Sea. The Investment Fund and the project in particular are in line with the "Strategic Action Plan for the Protection and Rehabilitation of the Black Sea" which had identified discharges of nutrients, nitrogen (N) and phosphorus (P), as the most serious problem leading to the degradation of the Black Sea ecosystem. Nutrients of agricultural origin were found to constitute more than 50% of the nutrients transported by the Danube River and Romania was a significant contributor. Like other riparian countries Romania had signed the Bucharest Convention committing itself to reducing nutrient flows to the Danube.

At the time of Appraisal, Romania was on the path of EU accession and facing the challenge of harmonizing with the EU environmental acquis. Given its large agriculture sector, the EU Directive 91/676/CEE- Directive regarding water protection against pollution with nutrients originating from agriculture ("the Nitrates Directive") was of special importance. Inappropriate unprotected storage of manure on in backyards and farm grounds and dumping of manure on roadsides and farms was the main source of nutrient pollution. Excessive application of fertilizers had ceased to be a source of nutrient pollution due to the phasing out of subsidies for mineral fertilizers in the early 1990s. On the other hand, Romania's accession to the EU was expected to lead to renewed intensification of agriculture, notably through mineral fertilization of soils. Romanian policy makers aimed at counterbalancing this expected trend through the implementation of the Nitrates Directive, which includes both appropriate fertilization techniques and proper storage and application to land of manure as part of good agricultural practices. Policy makers sought a pilot project which would test these practices under Romanian conditions and devise a strategy for country-wide implementation.

Agricultural pollution had also consequences for the rural population. Run-off caused contamination of groundwater wells which were used for drinking water supply causing nitrate poisoning among infants. In 1997, in the Calarasi County, the project area, an analysis of samples from 45 public wells revealed that over 79% of the samples exceeded acceptable levels of chemical content and 76% of samples exceed bacteriological standards. Poor families who could not afford bottled water were affected most.

The project perfectly fit with the main focus of the 2001 CAS, namely support for EU accession and poverty reduction. In particular it was consistent with one of in the CAS's five priorities: Protection and sustainable management of natural resources and the environment. The project directly addressed the major development challenge of protecting and enhancing the environment, assisting the country towards EU accession and institution building. The project was designed as a pilot for later country-wide implementation of the EU Nitrates Directive.

1.2 Original Global Environment Objectives (GEO) and Key Indicators (as approved)

Global environmental objective: To reduce, over the long-term, the discharge of nutrients (nitrogen and phosphorus) and other agricultural pollutants into the Danube River and Black Sea through integrated land and water management of the Calarasi region and ecologically sustainable use of natural resources in two agricultural polders.

Key Indicators:

(i) Percentage of households with livestock in project area adopting improved manure handling facilities - targeted to move from baseline of zero to 45% by 2006 and 65% by 2010;

(ii) Percentage cropped area coming under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manure - targeted to reach 30% by 2006 and 65% by 2010;

(iii) Percentage of cropped area employing environment-friendly practices - target of 65% by 2010; and

(iv) Trends in water quality indicators at designated sites - flow of nitrogen and phosphate to Danube River to be reduced by 10% by 2006.

1.3 Revised GEO (as *approved by original approving authority)* and Key Indicators, and Reasons/Justification

The GEO was not revised.

Indicator No.4 "Trends in water quality indicators at designated sites" was revised in the sense that it would not be measured in numerical values, but only in terms of direction (positive, neutral or negative.). This was necessary as a numerically measured indicator would have necessitated a high-cost complex geo-hydrological model and intensive sampling while adding little to the attainment of the GEO.

1.4 Main Beneficiaries

At appraisal the primary target groups were identified as:

(i) All forty-eight communities (comunas) of the Calarasi County comprising about 410,000 ha of arable land and a total population of 332,000 in 94,000 households, where the Project would provide support for technology adaptation and extension interventions for environment-friendly agricultural practices;

(ii) Seven comunas of the Calarasi County comprising a total area of about 90,000 ha of which 70,000 ha was arable and a total rural population of 26,700 in 10,540 households. These comunas participated in the manure management and demonstration of environment friendly agricultural practices sub-components;

(iii) Local communities around the Calarasi County who would benefit from the demonstration effect of the project.

The main target groups did not change during project implementation.

Other groups who benefited from the project were Central Government agencies, notably the Ministry of Environment and Sustainable Development (MESD)' and the Ministry of Agriculture and Rural Development (MARD)[2], as staff knowledge on environmentally friendly agriculture was strengthened, allowing them to implement a country-wide follow-up project in fulfillment of EU Nitrates Directive (ND) requirements.

1.5 Original Components *(as approved)*

The project comprised four components:

Component 1: Activities in the Calarasi County (US$9.22 with US$4.02 GEF)

The component consisted of four sub-components:

(a) ***Manure Management Practices*** *(US$5.20* ***with*** *US$2.54 GEF.)* Provision of incentives to comunas and individual households for the installation of improved manure storage facilities and equipment for manure collection and application in seven comunas. Provision of grants to a few large private dairy and pig units covering up to one third of the cost of installing solid or liquid waste handling systems. Construction of near impermeable facilities for storing manure would contribute to the achievement of the project objectives by reducing nutrient leakage into the groundwater.

(b) ***Promotion of Environment-friendly Agricultural Practices*** *(US$2.46* ***with*** *US$0.82* ***GEF.)*** Promotion of (i) environmentally-friendly agricultural activities (nutrient management, shrub rows, narrow vegetative barriers, conservation tillage, tree planting and riparian buffer strips), and (ii) demonstration of integrated crop and nutrient management. Members of the local agricultural community would be competitively allocated grants for projects demonstrating application of these practices. As these practices lead to lower application to land of nutrients and retention of nutrients in soil, their successful replication would allow an overall reduction in N and P levels reaching the Danube.

(c) ***Integrated management of Boianu-Sticleanu Polder and Ecological Restoration of part of the Calarasi-Raul Polder*** *(US$1.09* ***with*** *US$0.45* ***GEF.)***

(i) In the Boianu-Sticleanu Polder: (a) Plantation of trees for agro-forestry on the degraded lands adjacent to the Iezer Calarasi and buffer strips on unproductive riparian land; (b) implementation of the Code of Good Agricultural P'ractices (CGAP) on the neighboring arable land; and (c) implementation of a conservation management plan for the proposed Iezer Calarasi nature reserve.

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[1] The name of this Ministry was "Ministry of Water and Environmental Protection" in early phases of the project. It was changed to "Ministry of Environment and Sustainable Development" during project implementation. The functions and mandate of the Ministry vis a vis the project was not affected by this change. For consistency this document refers to it by the latter name.

[2] Similarly, in earlier phases of the project the name of this Ministry was "Ministry of Agriculture, Food and Forests" and was changed to "Ministry of Agriculture and Rural Development". For consistency, in this document it is referred to as "Ministry of Agriculture and Rural Development".

(ii) Regarding the Calarasi-Raul Polder: Studies for restoration of wetlands on part of the polder and restoration program.

Both sets of activities would reduce the flow of nutrients to the Danube. Wetlands are known to sequester nutrients.

(d) ***Strengthening Capacity in Calarasi County (Environmental Protection Inspectorate (EPI) and Public Health Directorate) to Monitor Soil and Water Quality and 'Environmental Impacts (US$0.46 with US$ 0.21GEF.)*** Setting up, implementing and provision of training and equipment for a soil and water program in the project area. Improved monitoring capacity would help policy makers and regulators plan and enforce measures which limit agriculture's contribution to nutrient flows.

Component 2: Strengthening National Policy and Regulatory Capacity (US$0.27 with US$0.21GEF) Support to MESD and MARD for:

(a) Work relating to the application of the Nitrate Directive and harmonization of legislation with EU requirements;

(b) Developing a CGAP; and

(c) Strengthening the National Authority for Ecological Agriculture (NAEA) when it is established.

The EU ***acquis*** requires broad-based application of environment-friendly agricultural practices in member states' farming communities; hence project support to ***acquis*** implementation would help achievement of the PDO. Support to NAEA which was to promote scientific organic farming and land use management would help the Government help the farming community implement these practices.

Component 3: Public Awareness and Replication Strategy (US$0.45 with US$0.38 GEF)

Support for broad public information campaign on the project's activities and benefits at the local, national and regional levels. The project would strive to induce behavioral changes necessary to the success of the project (notably use of manure management system, environmental friendly agricultural practices) so that the overall goal of reducing nutrient discharge to the Black Sea could be achieved.

Component 4: Project Management Unit (PMU) (US$0.87 with US$0.54 GEF)

Support to the operations of a PMU located in the offices of the Directorate General for Agriculture (DGA) of Calarasi. Effective project management would ensure that project outputs are realized in a timely manner and the project objective is achieved.

1.6 Revised Components

There was no significant change to the project components in the course of implementation. However some activities in sub-components la, 1b, 1c and 2c were dropped or amended, as listed below (sub-component identified in parentheses):

- A lower number of household platforms were built (2,250 as opposed to the originally envisaged 4,000) due to significant increases in the cost of these facilities relative to the costs estimated during project preparation. The increase in costs was

due to a general increase in the price of construction materials and labor and a severe depreciation of the US Dollar against Leu. Transfer of funds from other project components was considered to partially increase the number of these facilities, however this idea was rejected, because (i) the households with a large number of livestock and those most likely to be contributing to nutrient discharge into the groundwater were already selected to participate in the project; and (ii) financing additional individual manure storage facilities would not bring significant impact from the project objective perspective (1a.)

- Support to large private dairy and pig farms from project funds was dropped as no expressions of interest were received from such farms at the proposed level of project grant co-financing. The main reason for this lack of interest was the availability of EU funds at better terms. Facing a choice between increasing the grant contribution ratio and dropping the activity, the project steering committee opted for the latter and reallocated funds to the support of activities that were of higher priority for the local communities, such as afforestation. This was considered a better use of international grant funds especially since through EU funds allowed private farms to reduce their nutrient leakages, which also supported the project's GEO (1a.)
- Equipment for DGA for monitoring (GIS facility Land use information system) was dropped because the Payment Agency (Agency set up to process rural development payments to farms) has this equipment and purchasing the same equipment for the DGA would have been an unnecessary duplication (1b.)
- 488 ha as opposed to the 1,090ha originally planned land in the Boianu-Sticleanu Polder were afforested. Instead comparable erosion prone land in the terrace area was afforested and the total afforested land reached 1,570ha. The reason for this shift was that a significant portion of the land in the polder that had been proposed for afforestation was under private lease. The private commercial farms (the lessees) had a concession agreement with the Agency for State Domains (the lessor) which stipulated that the lessees would allow implementation of the CGAP on these lands, including afforestation of degraded agricultural lands. However, the enforcement instruments were missing / weak, and, while other elements of the CGAP were implemented in the polder, afforestation was achieved in a much smaller proportion. Towards the end of the project, some parts of the land were transferred by the farms to the National Forestry Amendment (NFA), and thus NFA was able to afforest those areas. Funds allocated to the polder were directed to the afforestation of degraded areas on the terrace instead (1c.)
- The envisaged rehabilitation of the Calarasi-Raul polder was not achieved because the feasibility study indicated much higher costs than those estimated at appraisal, insufficient social consensus regarding the land use changes that the restoration would necessitate, and necessary amendments to the technical solution envisaged at appraisal which would have led to high maintenance costs. However, the project-funded feasibility study helped the local government in applying for a followv-up EU grant for implementing similar activities on the polder (1c.)

- Support to the envisaged National Agency for Ecological Agriculture was not materialized, since the proposed agency was never set up, and the small department which initially existed in MARD was also abolished (2c.)

The dropped activities listed above did not require formal WB Board approval since they were not substantial in terms of project costs or the achievement of project objectives.

1.7 Other significant changes

No other significant changes occurred.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

Key factors during the preparation stage that affected implementation and outcome are summarized below.

The background analysis was sound. The rationale for the physical interventions of the project was provided by the Black Sea Danube Transboundary Diagnostic Analysis carried out in the late 1990s by an international group of scientists and concluded that agricultural pollution caused at least 50% of the nutrients discharged into the Danube and reached the Black Sea. This analysis was supplemented by an analysis of social acceptability as discussed under lessons learnt below.

Lessons Learnt Incorporated in Project Design

Although the project was a first in Romania to pilot APC practices, it benefited from the incorporation of lessons learnt from earlier operations, both in Romania (notably the Romania Danube Delta Biodiversity Project) and in the region (notably the Poland Rural Environmental Protection Project):

(i) *Lesson:* The early involvement of key stakeholders in project preparation, specifically including local communities and influential decision makers, is essential in order to ensure ownership and successful project implementation.

Agricultural Pollution Control Project (APCP) response: Project developers focused on identifying local stakeholder priorities as first step in project design. Key local stakeholders were comunas and the DGA of Calarasi. Mayors and local councils representing comunas pointed to communal level organic waste platforms as well as support to households for waste segregation as a first priority. These measures would help them solve the widespread problem of illegal haphazard dumping of mixed waste for which the comunas had been fined by the EPI. A survey among inhabitants of the comunas found that people had no alternative but to dump their waste on unauthorized sites and requested proper facilities. The project's main intervention thus focused on facilities for storage and segregation of organic household waste including manure. These interventions also responded to the EPI's main concern on leakage of nutrients and other pollutants from unauthorized dumps. Its request to improve monitoring of such leakage and impact on ambient water quality was met through project support for local capacity development for water and soil quality monitoring.

DGA of Calarasi viewed CGAP and associated training funded by the project as an instrument to improving its demonstration and extension services to farmers. As an indication of its commitment to the project it provided free office space to the PMU from its earliest stages.

(ii) *Lesson.* Environment friendly agricultural activities should yield tangible benefits for key stakeholders, specifically local communities, in order to ensure adoption.

APCP response. The environment friendly agricultural activities selected for project support were known to yield tangible benefits to the local communities, as reflected in the PAD: (i) additional income from effective use of organic waste (manure as fertilizer), crop rotations, organic produce, and improved livestock grazing practices; (ii) improved production efficiency through low input use and better farm management; (iii) improvements in health and sanitation following improvements in the drinking water and general hygiene of the villages; and (iv) through terrestrial and aquatic habitat enhancement, increased populations of birds and fish species of local economic and social importance.

(iii) *Lesson. An* effective monitoring and evaluation mechanism needs to be developed and applied to gauge project impact and feed lessons into project design.

APCP response. An effective monitoring and evaluation mechanism was put in place at the beginning of the project. M&E was used to measure the projects impact, adjust project operations, and amend the mode and content of project activities as needed.

(iv) *Lesson.* Decentralized responsibility for financial and project management (e.g., in the Romania Danube Delta Biodiversity Project) build local ownership and sustainability of project activities; counterpart training and specialized support for project related activities such as procurement, disbursement, financial management (FM) are a must.

APCP response. Decentralized responsibility for financial and project management was achieved by locating the PMU in Calarasi County, housed in the DGA. Provision of training to PMU in procurement and FM was incorporated in the project budget. Local leaders were involved in project design from the early stages of identification.

(v) *Lesson.* Dissemination of information about the benefits of improved environmental management is critical to the widespread adoption of new technologies and practices.

APCP response. A public awareness campaign was made one of the focal activities of the project and is considered by all stakeholders contacted by the ICR mission as a major factor in the project's success.

The rationale for the Bank's involvement was sound. The Bank's distinct comparative advantage in investment operations allowed it to carry out on the ground investments which were needed to reduce nutrient pollution from agriculture. The Bank had already supported and gained experience from the Poland Rural Environmental Protection Project which was similar to the APCP. The Bank was also leading the GEF co-funded Investment Fund for Nutrient Reduction in the Black Sea Danube Basin which put it in a

good position to transfer experience among 13 basin countries. Furthermore, the Bank had been supporting a number of agriculture and biodiversity protection projects which provided the Bank with a significant understanding of these sectors. The assessment that the Bank-funded Agricultural Support Services Project (ASSP) would allow for synergies in the demonstration of environment friendly agricultural practices proved correct.

Theproject was designed well. A key element of the project design was its geographical focus. Implementation arrangements were also non-complex, with one government agency, the MESD being in charge of the entire project. The alternative of dividing project components among MESD and the MARD would most likely have led to delays, as has been the case in other multi-agency projects. With respect to the thematic focus of the project one might question whether sub-components 1b and 1c made the project unduly complicated and whether the project should have not concentrated on manure management only. As discussed in the PAD, this option was considered but dropped by the designers with the justification that agricultural nutrient pollution reduction requires more than just manure management. This justification is acceptable in the light of the broad scope of environment-friendly agriculture and the need of Romanian farmers and agricultural extension services to be trained in them so as to implement the EU ND. The timely implementation of these components and of the entire project indicates that the design was not overly complicated.

One shortcoming in the design relates to the sub-component 1c where the importance of land ownership issues was either neglected, as in the case of the planned afforestation of 1,090 ha on the Boianu-Sticleanu Polder or underestimated, as in the case of the rehabilitation of the Calarasi-Raul Polder. With regard to the Boianu-Sticleanu Polder, a more realistic assessment of NFA's capacity to enforce afforestation on leased land would have indicated an overly ambitious afforestation target in the polder. The land ownership issue in the Calarasi-Raul Polder was raised in the PAD as a modest risk and mitigation measures were identified as "The land has been leased for long term. GoR is requiring the lessee to follow good agricultural practices in the area as required by APCP". A more thorough investigation of the contractual relationship, GoR's ability to impose GAP activities in the absence of an enabling regulatory framework, and social issues around this would have likely led to a more realistic risk assessment and the exclusion of this activity from the project.

Government commitment was highly **satisfactory**. The high level of local governmental involvement in the project design is discussed under Lesson (i) above. Among central governmental stakeholders, the commitment of MESD and the MARD was important for the project's success. The project concept was discussed extensively in round table meetings and the project designers made an effort to reach compromises among stakeholder interests so as to ensure ownership from all key stakeholders. Key among these central agencies was the National Water Authority under MESD which was responsible for implementing the EU ND in a relatively short period of time and regarded the project as a key activity in this regard.

Assessment of risks. Key risks to project implementation identified at Appraisal are listed in the PAD. The risk ratings proved to be mostly adequate. The "substantial risk" rating for "beneficiary cannot develop new manure handling and storage systems that are financially attractive" was correct. Social surveys carried out during the project indicated

that most households would not be able to afford individual bunkers on their own and government grants were necessary for their uptake. In case of commune level storage facilities, a combination of donor, comuna and county funding made their construction possible which was also highlighted as a risk mitigation measure. On the other hand, experience in project implementation showed that the risk associated with "landownership issues for polder restoration" in the case of the Calarasi-Raul Polder was underestimated and risk mitigation measure identified proved ineffective. Furthermore, the risk of the status of land on the Boianu-Sticleau Polder designated for afforestation was not taken into account in the risk assessment carried out at appraisal.

2.2 Implementation

Project implementation was highly successful. There was no project restructuring and the project was at no time at risk. Furthermore the project was the only project in Romania in recent years which was completed in the originally foreseen time without any requests for extension. Implementation performance was satisfactory throughout the project period and in fact became highly satisfactory in the final year, as documented in the ISRs. Key factors leading to highly successful implementation were:

- Constant Government commitment, especially at the local level;
- Highly effective PMU with good skill composition (managerial, public relations, technical, fiduciary);
- Flexible management.

The first two factors are discussed in detail in other parts of this report. Flexibility on the part of both the Government and of the WB supervision team was key to successful implementation as it allowed the revisions to project components discussed above in a relatively smooth manner.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

An M&E Plan was designed during project preparation and included in the Project Implementation Plan (PIP). A full-time member of the PMU titled "M&E and Technical Specialist" was in charge of M&E activities during the entire project implementation.

M&E design. The M&E plan was comprehensive and, despite some shortcomings, allowed for adequate measurement of outputs and outcomes.

M&E implementation was adequate. Appropriate data were collected most of the time for the majority of the indicators. The indicators which depended on social surveys were not measured during the first two years of project implementation as such surveys were not carried out. These surveys could not be carried out because time was needed to build and start the operation of the first manure facilities and to install the demonstration fields for the environment friendly agricultural practices. In the case of complex indicators the PMU made an extra and honest effort to use available data in a meaningful manner.

M&E utilization. The PMU assessed appropriate data and formally reported them in biannual project progress reports. These reports were shared with the MESD and World

Bank supervision missions. The M&E results enabled implementers to gain detailed insight in outputs from individual project activities and address implementation problems.

2.4 Safeguard and Fiduciary Compliance

Financial management

Throughout the project life a highly satisfactory financial management system was maintained. The Recipient respected the relevant GEF grant financial covenants by submitting to the Bank quarterly financial monitoring reports and annual audit reports in a timely manner and in a format acceptable to the Bank. Audit opinions were all unqualified and no internal control issues were mentioned, including in the final audit of the project, submitted in August 2007. Counterpart financing, including funding received from Central Government, Calarasi County Council and budgets of the seven participating comunas was highly satisfactory during the project life.

The financial management capacity built throughout the project life in the PMU within the MESD has been transferred and scaled up to the Integrated Nutrient Pollution Control Project, which is financed through an IBRD loan and a GEF grant. Thus, the APCP financial management systems, procedures and certain project staff will be used as part of the new project's institutional arrangements.

Procurement

Procurement management was successful and cooperation between the Borrower and the Bank was very good. Throughout the project the PMU had sufficient level of delegation by the implementing agency, which allowed smooth implementation of the project (despite some staff turnover). As the project had numerous procurements subject to post-review supervision missions regularly included procurement staff to conduct post review. However no major deviations from the Bank's Guidelines were found.

Disbursement

Disbursement of project funds followed the projections made at the beginning of project implementation and no significant delays were experienced. There were no deviations or waivers from Bank disbursement policies and procedures.

Environmental assessment

During preparation, the project was categorized as a "category B project" requiring partial environmental assessment. An environmental assessment plan and an environmental management plan (EMP) were prepared. The latter identified mitigation measures (design to be prepared under the supervision of the county council engineering staff and the EPI) and monitoring measures (regular water quality testing around the storage facilities).

Compliance with the above mitigation and monitoring measures was satisfactory throughout the project. A consultant environmental specialist hired by the Bank in late 2004 found that the EMP was implemented adequately. Specifically the consultant confirmed that: (i) the design of the large and individual manure storage facilities was

prepared under the supervision of the Calarasi County Council engineering staff; (ii) the EPI ensured that the construction of the manure storage facilities met environmental guidelines on stopping manure leakage to surface or ground water sources and an environmental permit was issued for each comuna platform); (iii) facilities were not built close to any surface water body; (iv) an extensive soil and water monitoring program to ensure that leakage of manure to groundwater does not occur was implemented; (v) the institutional capacity of the Calarasi Water Management Service was strengthened by the project; and (vi) a public awareness campaign was undertaken to create awareness and promote adoption of environment-friendly manure management practices.

None of the Bank's other safeguards policies applied to this project. Furthermore, no social risks due to the project arose during implementation.

2.5 Post-completion Operation/Next Phase

Transition arrangements. Project investments were carried out in close cooperation with local beneficiary institutions which began using assets procured by the project from the date of acquisition during the implementation period. Hence special transition arrangements were not necessary. Various aspects of sustainability of their operation are discussed in detail under Section 4 "Assessment of Risk to Development Outcome".

The key performance indicator by which the project (outcomes) can be monitored and evaluated in the future is "the trend of nitrate pollution of water bodies in the project area". Collection of these data is an integral part of the Calarasi Management Service's monitoring program since the county is a "Nitrate Vulnerable Zone" (NVZ.) The institutional capacity and funding to carry out this monitoring are adequate, as discussed in Section 4. While a centrally maintained M&E system to monitor all project investments will not be available in the post-project period, beneficiary organizations are expected to continue monitoring and evaluating key project outputs. This is particularly the case of comuna administrations that will monitor use and maintenance of household bunkers of and comuna platforms for the purpose of planning their waste management activities. Furthermore, the local Environmental Protection Agency (EPA) will continue to monitor and enforce measures against activities that will cause nutrient pollution of water bodies in the project region, and the county soil laboratory will continue to monitor and report on soils.

A follow-up operation has been designed to replicate the APCP in other parts of Romania. On October 30, 2007 the World Bank Board of Directors approved the "Integrated Nutrient Pollution Control Project" (INPCP) which will cost US$ 81.20 million (of which US$ 68 million is financed by the IBRD) and builds on the positive experience from the APCP.

INPCP's overall development objective is to support the Government of Romania to meet the EU ND requirements by (a) reducing nutrient discharges to water bodies, (b) promoting behavioral change at the communal level, and (c) strengthening institutional and regulatory capacity. The GEO is to reduce over the long term the discharge of nutrients into water bodies leading to the Danube River and Black Sea through integrated land and water management. The project will support four components: (i) a menu of investments focusing on NVZ-designated comunas in ten river basins and eleven

counties; (ii) capacity building within the MESD and their National Water Authority, as well as other national regional and county agencies involved in the ND; (iii) broad public awareness and information campaign focused on investment replication and behavior change; and (iv) PMU. The INPCP will use the Calarasi County as a training area for the eleven new beneficiary counties while adopting the specific project activities to their specific socio-economic, geo-morphological and cultural characteristics.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

The relevance of the project's objectives, design and implementation are highly relevant to Romania's current development priorities, as Romania, a new EU member, tries to implement the environment chapter of the ***acquis communautaire.*** The Country Partnership Strategy of 2006 emphasizes the high cost (about Euro 30 billion during 2004-2015) and institutional capacity requirements of this endeavor.

The EU ND is among the costliest and most labor intensive parts of the EU environment related legislation due to the structure of the Romanian agriculture sector. The country's 251 NVZs are dominated by small family farms with an average of 2.2ha of arable land and small holdings of livestock (typically one or two cows, pig, chickens and sheep). The vast majority of these farms do not follow proper practices for manure collection, handling and storage. Nutrient leachate contaminates groundwater which still constitutes the main source of drinking water in rural areas accessed through wells. High concentrations of nitrates continue to lead to public health threats, as indicated by incidences of acute methaemoglobinaemia, commonly known as the "blue baby syndrome". Significant EU grants will be available for farmers under the Common Agricultural Policy (CAP) Pillar 2 to help them make necessary on-farm capital investments. However, knowledge on good practices is very limited among small and medium farmers. Hence, there is a need for substantial demonstration of best practices, farmer training, and awareness raising. Best practices piloted under the APCP in Calarasi offer a tested model to be replicated in all NVZs of Romania, through the INPCP. The project's objective also remains a global environment priority. Reducing nutrient pollution in the Black Sea continues to be a priority in the region. The GEF WB UNDP Strategic Partnership for Nutrient Reduction funds projects aiming at reducing agricultural nutrient pollution in Moldova, Serbia, Turkey, and Croatia in addition to Romania. Furthermore, pollution reduction is among the key aims under the EU Water Framework Directive. To fulfill the requirements of this directive, the 13 riparian countries of the Danube River basin are cooperating to develop a river basin management and action plan by 2009-2010. Data and experience gained under the APCP are helping Romania fulfill its obligations to contribute to the plan's development.

3.2 Achievement of Global Environmental Objectives

The project's outputs provide strong indication that the project's global environment objective "to reduce over the long-term the discharge of nutrients and other agricultural pollutants into the Danube River and Black Sea through integrated land and water management of the Calarasi region and ecologically sustainable use of natural resources

in two agricultural polders" has been achieved. This can be illustrated through the values achieved for the four key performance indicators identified in the PAD:

Indicator 1: Percentage of households with livestock in project area adopting improved manure handling facilities. As the results of a social survey carried out in early 2007 indicated, the percentage of households with livestock in the project area using village manure storage, household bunkers and segregating waste materials reached 54.4% compared to the baseline of 0%, and end-of-project target value of 45%.[3]

Indicator 2: Percentage cropped area coming under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manure. The same survey found that the percentage of area under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manures is 34%, compared to the baseline of 1%, and the end-of-project target value of 30%.

Indicator 3: Percentage of cropped area employing environment-friendly practices. Over the course of the project the area under environmentally friendly practices increased from 0% to 33.9% exceeding the target value of 30%.[4]

Indicator 4: Trends in water quality indicators at designated sites. The water monitoring program found a decreasing trend in N and P in the water bodies of the project region that drain into the Danube River. In other words the trend in water quality was found to be ***positive.*** Estimations based on land under environment friendly agricultural practices indicated a decrease in nutrient discharge into surface and ground waters of about 15 % for N and 27% for P in 2006. These values exceed the target value of 10% for 2006.

The results captured by indicators no. 1-3 point to rural Calarasi communities' increased ability to keep in check expected nutrient releases following from a likely intensification of agriculture as a result of Romania's participation in the EU CAP. In addition to the above indicators, the project's success in achieving implementation and enforcement capacity and skills to develop project proposals for EU funding, especially at the local levels, in raising public awareness in rural areas of proper practices to reduce environmental pollution, and strengthening the communication between communities and their mayoralties should be highlighted.

3.3 Efficiency

The PAD in line with GEF requirements included an incremental costs analysis (ICA) of the project which predicted that the project would introduce and demonstrate more sustainable and environmentally benign technologies and practices at an estimated incremental cost of US$ 5.15 million over the baseline scenario. The project achieved this objective at the estimated incremental costs.

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[3] Annex 1 of the PAD indicates a target value of 65%, but does not specify by what year this is to be achieved. The M&E framework included in the PIP indicates that 65% was foreseen for 2010 whereas 45% was foreseen for 2006.

[4] The M&E framework included in the PIP indicates that 65% was foreseen for 2010 whereas 30% was foreseen for 2006.

To further evaluate the efficiency of the project, cost effectiveness (CE) ratios, defined as the cost of reducing one kg of N or P leakage into surface and ground waters were calculated for individual environment-friendly practices.

The estimated CE ratios vary between US$10/kg and US$40/kg depending on the practice considered. At US$10/kg nutrient management was found to be the most cost effective practice, followed by strip crops and cover crops (US$12-15/kg.)[5] At US$30-40/kg manure management was the costliest practice, which is explained by the high initial capital cost.

These CE ratios may be compared with those achieved in other parts of the world. In Poland, the CE ratios achieved by the Bank funded Rural Environmental Protection Project in four regions ranged between US$18.5 / kg N and US$24.8 / kg N. These CE ratios are lower than the above estimates for the Romania APCP since they were calculated in present value terms with a discount rate of 10% and expressed in 2000 Dollars while the CE ratios in Romania are in current value terms. In the Chesapeake Basin of the United States the median CE ratio for animal waste systems was estimated at US$39 / kg N removed for animal waste systems and at US$19.5/kg N removed for the combination of nutrient management and animal waste systems. (Both values are in 2003 terms.) It may be concluded that the CE ratios achieved in Romania are broadly in line with international experience.

3.4 Justification of Overall Outcome Rating

Rating: Satisfactory.

The overall outcome rating is based on a combination of the achievement of objectives, relevance and efficiency. The GEO was fully achieved as evidenced by measurements on four key performance indicators. The project remains highly relevant, as evidenced by the large follow-on loan project which will build on the model it piloted. The cost effectiveness ratios with which these results were achieved are comparable with those realized in other parts of the world.

This rating also reflects the project's success in bringing about behavioral change in the target population for better environmental management in rural areas. The project demonstrated effective work with communities to this end. As such the project proved a successful pilot not only for Romania, where it is now replicated through an IBRD funded project across the country, but also in other countries of the Black Sea Basin.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

Social surveys have indicated that a key "unplanned" outcome of the project was improvement in relations between mayoralties and comuna members. This was a result of tools provided to citizens to communicate their needs and expectations to their administrators provided by the project.

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[5] Estimates conducted by the PMU.

(b) Institutional Change/Strengthening

Studies carried out under the project also found increased local capacity to access and manage community development projects due to their experience with the APCP.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

In the spring of 2007, a survey and in-depth interviews were carried out among stakeholders in the project region. The study aimed at assessing the project's impact on the target population and evaluated the level of use of environment friendly agricultural practices and of nutrient management plans, at the levels of both agricultural associations and individual households. The following are the key findings of the study:

- The number of associations using composted manure from comuna platforms and implementing environment-friendly agricultural practices increased from 2005 to 2006.
- Among households that work the land themselves, the most frequently used environment friendly practices were crop rotation and seed selection, however at a much lower rate than associations. Land size emerged as a key determinant.
- In 2006, households used crop rotation and expert-guided chemical fertilizer application more frequently than in 2005.
- Most of the problems encountered earlier with regard to garbage and manure management were solved thanks to the efforts of the APCP and of the local administration. Also water pollution was reduced as was the incidence of nitrite poisoning.
- Improper utilization of individual platforms and euro-bins was lower in 2007 than in 2005 and 2006.
- The project was relatively well known in the project region among households and other local stakeholders, being primarily associated with garbage management.
- The project effects were perceived generally as positive.

  The project seemed to have positive consequences also at institutional level, mayoralties being the main beneficiary. Improvement in relations between mayoralties and comuna citizens and in local capacity to access and manage community development projects were cited by persons interviewed.

4. Assessment of Risk to Development Outcome

Rating: Moderate

A sub-component-by-sub-component analysis is provided to substantiate this rating.

(a) Manure Management Practices

The sustainability of the operation of village and household level platforms is closely linked to the sustainability of the commune level waste management system which involves storage and segregation at the household level, transport to the village platforms, spreading on private farmland and communal pastures. High level stakeholder support

will play an important role. Local communities appreciate the cleanliness of their backyards and communal areas as indicated by the social survey of May 2007. One of the mayors is using the comuna newspaper for social "blame and shame" to enforce proper disposal of manure and other garbage in the designated storage facility rather than dumping on unauthorized areas. Public awareness is expected to continue to grow through the follow-on project, INPCP. The financial sustainability of the system will hinge on a combination of user fees by households, cost sharing by buyers of composted materials, comuna budget allocations to cover the operations and maintenance (O&M) of the comuna facilities. In the two comunas visited by the ICR mission, fees covered between 30-40% of O&M costs. Mayoralties intend to gradually increase the fees, while recognizing limitations posed by households' ability to pay. Furthermore, one of the comunas charges a large poultry farm unsubsidized fees for the transportation and disposal of its manure on the communal platform. There are also encouraging signs of contributions by buyers. In one comuna the farmers' association which spreads the composted organic waste on its farmland paid for transportation and spreading costs. While the further development of these and other user fee based financing modalities will take time, commitment by mayoralties is strong providing reassurance for financial sustainability in the short and medium terms.

In terms of physical sustainability, the design life of the village level platforms is 50 years. On the other hand the project life of household bunkers is low due to the quick degradation potential of the wooden walls surrounding a concrete base. Wooden planks degrade quickly when exposed to the highly acidic slurry at the bottom of the manure heap. However, the cost of wooden planks is relatively low (Euro3-5 / plank), so it is not expected to cause a hardship for households to replace them as they degrade every 3-8 years. Furthermore, concrete bases which have a life of about 20 years were designed to be mobile which would allow their easy transfer to other locations should the household decide to move or stop keeping livestock, a likely prospect in Romania's evolving agricultural sector. This also speaks in favor of project sustainability.

On the policy side, the environmental cross-compliance requirement under the EU CAP Pillar 1 area payment system is a strong incentive for agricultural households to continue to properly manage their manure.

(b) ***Promotion of Environment-friendly Agricultural Practices***

The social survey carried out in the spring of 2007 indicated a significant uptake of several environment-friendly agricultural activities. Several factors point to strong prospects for the sustainability of ongoing practices and increased adoption by farmers in the area. The key policy factor is the designation of Calarasi as an NVZ, which makes the implementation of CGAP compulsory in this county. Farmers also face a significant incentive to adopt some of these practices, notably shelterbelts/windbreaks and riparian buffers as these help prevent crop losses due to erosion which is highly prevalent in Calarasi. Institutionally, the project helped build capacity among agricultural extension agents, to adequately advise farmers interested in replicating these practices.

(c) *Integrated management of the Boinau-Sticleanu Polder*

The prospects for the sustainability of the afforestation program are positive because farmers benefit significantly from the trees' erosion prevention benefits. With regard to the Iezer Calarasi Lake Nature Reserve, commitment and technical capacity of the custodian, a commercial fish farm (SC Piscicola) to effectively manage the reserve according to the management plan, will be key factors for sustainability. The custodian stands to benefit from the positive public relations effect of adequate implementation of the management plan prepared under the project. It has allocated part of the time of one of its staff to manage the Reserve. However, SC Piscicola also faces a dilemma in that one of the bird species protected in the reserve feeds on young/small fish. Nevertheless, the local EPA Office interviewed by the ICR mission indicated that the farm has so abided by the terms of the custody contract and it has held a number of educational events for young visitors. Furthermore, the custodian has obtained support under an EU LIFE project for follow-up investments (such as additional basic visitor infrastructure specified in the Management Plan) to facilitate more of such activities. On the other hand, increased visitation will necessitate increased staffing for management which the custodian will have to finance.

(d) *Soil and Water Quality Monitoring*

The financial sustainability of the operations of the water laboratory of the Calarasi County Water Management Service and the soil laboratory of the Calarasi DGA appears good. Both laboratories charge for their services at levels that cover O&M costs. The nutrient analysis equipment procured under the project allows the laboratories to carry out analyses for third party clients. Furthermore, demand for such services is ensured to grow as the ND is implemented. The water laboratory also has other revenue sources, notably from river quarry operations. In fact, its revenues exceed its O&M costs by 35% which it transfers to a higher administrative level.

Strengthening National Policy and Regulatory Capacity

The project supported transposition of the EU ND into Romanian legislation and preparation of a CGAP are expected to be sustainable now that Romania is an EU member. Some 250 comunas have been designated as NVZ where CGAP implementation is compulsory. Further institutional capacity building for implementation and enforcement will be carried out under the INPCP.

Public Awareness

Public awareness raising activities will continue through the INPCP as well as through local media which some mayoralties use to promote proper manure management.

5. Assessment of Bank and Borrower Performance

5.1 Bank

(a) Bank Performance in Ensuring Quality at Entry

Rating: Satisfactory

The Bank ensured high quality in several aspects of project identification, preparation, and appraisal with only minor shortcomings in some aspects.

Strategic relevance and approach. The project identified was of high strategic relevance for Romania in its efforts to harmonize with the EU environment ***acquis*** and the evolving EU CAP, and for the Bank in its leadership of the GEF Investment Fund for Nutrient Reduction in the Black Sea and Danube. A successful pilot project in Romania, the largest country in the Danube Basin, would not only provide Romania but also provide the entire Black Sea Danube Region with a model to replicate. The approach to tackle nutrient leakage was well chosen. By emphasizing the domestic benefits of agricultural pollution control and combining it with the counties' own waste management and erosion control strategies, the project secured the full engagement of the local stakeholders throughout project preparation and implementation.

Technical, financial and economic aspects. The technical approach to manure management was relatively new and untested when it was designed for Romania. It consisted of a system of small household platforms and large village platforms, the latter being managed by the comuna administrations. Most EU member and candidate countries, including Poland where the Bank was supporting a project, aimed a reducing nutrient pollution focused on building larger on-farm manure storage facilities from where farmers take manure to their plots themselves. In particular, the financial sustainability of the system was questionable. However the system designed in Romania suited the predominance of very small farms with dispersed plots. Furthermore, households were mixing regular household (organic and non-organic) household waste with manure. The project design addressed this problem by introducing segregation at source and separate (though adjacent) platforms for different waste types at the village facility.

Policy and institutional aspects. Project support to policy harmonization with the EU ND and to institutional capacity building for its implementation, was highly appropriate and necessary for the attainment of the project objective.

Poverty, gender and social development aspects. The project's development objective was not specifically related to poverty alleviation, gender issues or social development. Nevertheless, reduction of nitrate pollution in communal wells and of the related incidence of the "blue baby" disease stood to benefit especially the poorer sections of the communities who did not have the means to purchase bottled water.

Environmental aspects. The low potential impact of project interventions on the environment justifies the categorization of the project as a "category B project" for environmental safeguards purposes. An environmental assessment was carried out. A summary provided in Annex 11 of the PAD indicates that nutrient leakage from village level platforms was identified as the key potential impact. The associated management plan identified mitigation measures (design to be prepared under the supervision of the county council engineering staff and the EPI) and monitoring measures (regular water quality testing around the storage facility). It is common practice for environmental assessments of construction activities to also consider the potential adverse effects and mitigation measures during the construction phase itself, but this was likely omitted due to the remote location of the selected locations for the village platforms.

Fiduciary aspects. The fiduciary aspects related to procurement were adequately considered and reflected in implementation arrangements made. Risks related to procurement were considered to be high; however project implementation experience demonstrated that mitigation measures were adequate for the risk level. Financial management aspects were also designed well leading to highly satisfactory FM implementation performance.

Implementation arrangements. Project implementation arrangements were well conceived. In particular, agreement with the Government that one agency would be in charge of overall project management (as opposed to dividing responsibility among two or more agencies) was highly appropriate. Furthermore, the selection of an agency, the MESD, which was committed to implementing the EU ND, was appropriate. On the other hand, it should also be noted the Bank team adequately recognized local and national agencies' points of interests in the project and worked with them to ensure that project was reasonably responsive to all. This ensured that diverse agencies collaborated smoothly during project implementation while leadership was provided by-one. Finally, the location of the PMU in Calarasi in the premises of the DGA was most appropriate, as was the arrangement that the PMU Manager would report to the County Council and to the Prefect, in addition to MESD, in ensuring local institutional ownership of the project.

Monitoring and evaluation arrangements. Adequate M&E implementation arrangements were made already during project preparation, as documented in the PAD. The PMU staff member in charge of M&E implementation attended a specialized M&E workshop which strengthened PMU's capacity to measure and report project indicators.

Risk assessment. As discussed under "2.1 Project Preparation, Design and Quality at Entry", the appraisal team assessed the risks facing the project generally well. In particular, the financial risk associated with the manure management scheme was correctly assessed as "substantial". However the risk assessment had the shortcoming that it (i) did not flag the private lease status of Boianu-Sticleanu land designated for afforestation as a risk and (ii) underestimated the risk associated with the landownership issues associated with the restoration of the Calarasi-Raul Polder.

(b) Quality of Supervision

Rating: Highly Satisfactory

Focus on development impact. Project supervision remained highly focused on achieving the project objective which in the words of a Calarasi administrator "lifted Romanian agriculture to a higher level" by making it environment friendly.

Supervision of fiduciary and safeguards aspects. Fiduciary supervision was carried out with efficiency and professionalism. Both the procurement and the financial management specialist assigned to the project were based in Bucharest, which allowed them to interact with the PMU directly and frequently. Supervision of compliance with environmental safeguards was satisfactory. The Bank team verified that village platforms were inspected by county engineering and environmental officials and water quality measurements were taken. The Bank hired a consultant environmental specialist in late 2004 to review compliance at all 13 village platforms completed up to that point. The results of the

review were documented in the aide memoire for the mid-term review in early 2005. One notes that the ISRs pertaining to the later part of project implementation indicate a "satisfactory" rating for environmental safeguards compliance although the aide memoires no longer document verification of mitigation and monitoring measures. This may be explained by the fact that the measures had become a routine part project implementation. Nevertheless, for the sake of completeness, such documentation would have been appropriate at least in the final supervision aide-memoire.

Candor and quality ofperformance reporting. Reporting on project progress was candid. The ISRs highlighted key issues in a to-the-point manner. While always diplomatic and constructive, the aide memoires and letters to the Government did not shy away from pointing out challenges in project implementation when they occurred. Risk ratings were adjusted in a timely manner. **A** good example is the increase in the risk rating of "land ownership" from moderate to high when this issue emerged as a serious obstacle to the activities in the polder area already seven months after project effectiveness. Implementation performance and global environment objective ratings were also adjusted in a timely manner to reflect changes in performance.

Role in ensuring adequate transition arrangements (for regular operation of supported activities after loan/credit closing.) Transition arrangements were not necessary since all project investments were implemented by local authorities from the day of their inception.

(c) Justification of Rating for Overall Bank Performance

Rating: Satisfactory

The Bank teams worked with their Romanian counterparts in a highly collegiate manner during project preparation and implementation. The latter greatly appreciated the respect shown to local and national authorities' insights and the flexibility with which requests for amendments in implementation were treated. The team mobilized international technical support when neededlrequested and helped the Romanian implementers share their experiences with countries in the region.

5.2 Borrower

(a) Government Performance

Rating: Highly Satisfactory

Government ownership and commitment to achieving development objectives was high. In particular, county and comuna level governments contributed significantly to project preparation and implementation. During project preparation, county and community governments clearly identified manure management as a priority for the project and committed resources for co-financing. The Central Government also embraced the project objective and allocated co-financing during project preparation. During project implementation, central, county and community governments facilitated, co-financed and participated in project activities. There was full ownership by Government agencies at all levels. Vertical and horizontal coordination was effective and characterized by professionalism and result orientation. County and comuna governments provided co-financing for investments in and operations of communal waste management facilities

and afforestation. The DGA of Calarasi supported the project financially by providing office space to the PMU.

Most implementation issues were resolved in a timely manner. A notable exception was the issue of afforestation on the Boianu-Sticleanu polder which emerged soon after project effectiveness. It took the agencies involved nearly two years to definitively resolve it in a satisfactory manner.

Fiduciary financial management, governance, provision of counterpart funding, procurement, reimbursements, compliance with covenants). The Government's performance in fiduciary issues was highly satisfactory. Notably, provision of counterpart funding by both local and national governments was timely and adequate. There were no issues with governance or compliance with covenants.

(b) Implementing Agency or Agencies Performance

Rating: Highly satisfactory

Agency commitment to achieving development objectives. The MESD was committed to reducing the nutrient pollution impact from Romanian agriculture in line with the requirements of the EU ND.

Adequacy of beneficiary / stakeholder consultations and involvement. During project preparation the implementing agency worked closely with county and comuna level stakeholders, including the prefect, the comuna mayors, the County and comuna councils, as well as national and county level branches of MARD, MESD, and EPI in order to identify their priorities. During implementation, county and comuna level agencies were main agents of implementation, and the PMU was based in the project area. Household surveys (one during preparation, one in 2005 and a final one in 2007) gauged the awareness of and satisfaction with the project on the part of the local population.

Readiness for implementation, implementation arrangements and capacity, and appointment of key staff. The PMU was fully staffed before project effectiveness and the structure of personnel and the specialists initially hired remained unchanged during project implementation, except for the Procurement Specialist. The PMU had an excellent mix of technical and managerial skills. The constant involvement in the project of the National Water Authority from the earliest stages of project identification until the end of implementation was also instrumental. The arrangement that project oversight responsibility was with the Under-secretary of State rather than with the Minister helped minimize disruptions associated with govemmental transitions.

Timely resolution of implementation issues. The Implementing Agency / PMU resolved most implementation issues within their realm of responsibility in a timely manner.

Fiduciary (financial management, governance, provision of counterpart funding, procurement, reimbursements, compliance with covenants.) Fiduciary management by the implementing agency was highly satisfactory. The PMU cooperated closely with the World Bank team.

Adequacy of M&E arrangements, including the utilization of M&E data in decision-making and resource allocation. M&E arrangements were adequate. Key indicators in the M&E fiamework, such as level of participation in manure management and other

environment friendly agricultural practices, were used to gauge the level of achievement of project goals and resource allocation.

Relationships and coordination with donors/partners/stakeholders. The MESD nurtured good cooperation with the USAID which provided grant financing for a village platform in Calarasi County and co-financed capacity building in the Calarasi County for water and soil monitoring and for strengthening national policy and regulatory capacity for nutrient management at MESD and MARD. The PMU was instrumental in keeping relevant agencies involved and informed in the project. It also nurtured exemplary relations with beneficiary communities and their leaders.

(c) Justification of Rating for Overall Borrower Performance

Rating: Highly Satisfactory

The performance of both the Government in general and of the implementing agency in particular was exemplary justifying the overall "highly satisfactory" rating.

6. Lessons Learned

The experience of APCP highlighted the importance of the following factors for smooth and timely project implementation:

- ***Ownership of local communities and their leaders through delivery of visible and tangible benefits.*** The afforestation program which helped farmers against erosion and the manure platforms which achieved health benefits and cleaner environment are most notable in this respect.
- ***A strong, full-time PMU with a good mix of diplomatic, managerial and technical skills based in the project area. Cultivation of good relations with ALL project stakeholders.*** The PMU Manager excelled in relations with stakeholders at all levels and gained their trust and respect. Technical staff of the PMU ensured smooth implementation of day-to-day project implementation, procurement, financial management, and M&E.
- ***Central Government responsiveness to local communities' expressed needs and preferences.*** The Central Government respected Country Council and comuna preferences in the design of project activities, notably the emphasis on manure storage as part of communal waste management and afforestation, and in amending some of the project activities, as discussed in earlier sections. This was a key factor ensuring the local ownership that the project enjoyed and led it to success.
- ***Flexibility and respect for client insights of Bank task team.*** The Bank Supervision team's attitude to supervision was not prescriptive. It offered technical support and opinion based on international experience but let the PMU which effectively represented local interests resolve implementation issues. As a result, project implementers were empowered to be creative and reach compromises as issues emerged.
- ***Dissemination of information through a broad public awareness campaign.*** This is critical to the widespread adoption of new technologies and practices.

Furthermore, information dissemination is needed early in the project cycle to overcome the considerable lack of understanding of the health and environmental benefits from improved waste management, and achieve significant participation in project activities.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

The summary of the Borrower's ICR was received on November 8, 2007 and is reproduced in Annex 7. While not explicitly rating the project's outcomes, the summary describes the project's outputs and outcomes in a highly positive tone. It emphasizes the behavioral changes that the project has brought about, the project's demonstration value and the important role that public awareness raising played in this. The ICR Team agrees with these observations.

A copy of the draft ICR was shared with MESD on December 13, 2007 for comments. The response received from MESD on December 20, 2007 indicated that the Ministry had no comments on the draft. This letter is reproduced in Annex 7. In verbal communication with the PMU it was confirmed that there were no issues of disagreement.

(b) Cofinanciers

In the early project implementation phase, USAID contributed US$ 150,000 to the project with which a comuna platform was built. The ICR team attempted to contact the USAID Office in Bucharest in the first half of December 2007 for comments on the draft ICR. However, due to the phasing out of the USAID Office in Bucharest in progress and the Holiday Season, contact could be established with the officer in charge of cooperation with the APCP only on December 28, 2007. The team expects to receive comments on the ICR in early January and will file them in IRIS.

Annex 1. Project Costs and Financing

(a) Project Cost by Component

Components	Appraisal Estimate (US$ millions)	Actual (US$ millions)	Percentage of Appraisal
Calarasi Component	8.41	9.23**	110%
Strengthening national policy and regulatory capacity	0.24	0.15	63%
Public awareness and national and regional replication strategy	0.38	0.42	111%
Project Management Unit	0.78	1.08	138%
Total Baseline Cost	9.81	10.88	111%
Physical Contingencies	0.36		
Price Contingencies	0.63		
Total Project Costs	10.80	10.88	101%
Project Preparation Facility (PPF)	0.27	0.27	
Front-end fee IBRD	0.00	0.00	
Total Financing Required	11.07	11.15	101%

* GEF PDF-B project preparation grant
** This figure includes the following items:

(i) The cost of the community platform (under sub-component 1a) funded directly through a USAID contribution of US$0.15million.

(ii) The cost of 11 sub-projects on environmentally-friendly agricultural practices US$ one million which were funded by the associated IBRD Agricultural Support Services Project (under sub-component 1b).

(iii) In –kind (labor) contribution from comunas (sub-components 1a, b, c) estimated at US$1.8 million.

(b) Financing

Source of Funds	Type of Co-financing	Appraisal Estimate (US$ millions)	Actual (US$ millions)	Percentage of Appraisal
Borrower		4.65	4.52	97%
GLOBAL ENVIRONMENT - Associated IBRD Fund		1.00	1.06	106%
Bilateral Donor (USAID)*		0.00	0.15	
Global Environment Facility (GEF)		5.15	5.15	100%
Total		10.80	10.88	101%

Annex 2. Outputs by Component

Component 1: Activities in the Calarasi County

(a) Manure Management Practices

This sub-component provided grants for the installation of improved manure storage facilities and equipment for manure collection and application in seven comunas. Grants on a cost-sharing basis where provided for the construction of village-level solid waste and manure platforms and of small storage platforms with effluent collection facilities at the household level. Beneficiary comunas also received equipment for manure handling and spreading. Community training and awareness on good practices for waste collection and manure management, including composting, testing, and field application, were also provided. The investment program for the commune /village level manure management consisted of construction of 18 platforms (17 financed by the project and one by USAID), with a total storage capacity of 53,900 tons. At the household level the project financed a total of 2,250 individual platforms. Also, farmers were provided with 5,710 waste! bins in order to help the farmers to segregate the waste. The individual bins, the individual platforms, the 18 commune level platforms and the equipment are being used by the beneficiaries.

(b) Promotion of *Environment-friendly* Agricultural Practices.

The Competitive Grant Scheme (CGS) was implemented from the start using a set of criteria and indicators that were set out in the operational manual of the Agricultural Support Services Project (ASSP). Two calls for proposals were made, first in June 2003 and the second in July 2003 and 21 concept notes were received by the ASSP Secretariat from which three were financed out of the APCP funds, and 11 from ASSP funds;, with a total value of US$1,104,812. These grants covered a wide range of applied research and extension technologies, such as improvement of cropping practices, diversification, integrated development, organic farming and farm management & information systems. These projects were well implemented and appreciated by farmers and a number of technologies are being increasingly adopted in the region.

Within the program for testing and demonstration of the environment-friendly agricultural practices, eight testing/demonstration areas were selected (2 in the polder area and 6 on the terrace) according to the criteria agreed in the Project Implementation Plan. The demonstrated practices included conservation tillage, shelterbelts/windbreaks, narrow vegetative barriers, filter strips, riparian buffers, nutrient management, agro-forestry, tree planting, grazing management, crop rotation and green fertilizers and land reclamation at the former unauthorized manure dumping sites. To support these demonstrations, the project provided the necessary planting materials and the specialized equipment for demonstration. Fourteen training sessions and field visits were organized with the participation of about 650 local farmers and specialists. A survey carried out in the project region in the Spring of 2007 showed that the percentage of area under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manures is 34%, compared to the baseline of 1%, and the end-of-project target value of 30%.

As regards the rehabilitation of communes' pastures and improvement of the grazing management, the project provided support for the rehabilitation of 240 ha of pastures in the terrace area as well as in the Polder, including fixed and electric fences, mowers and mobile shelters for the pasture administrators, as demonstration of good practices. The final supervision mission found that these demonstration pasture fields and equipment provided were being properly managed and used by the communities with the support of the mayors.

(c) Integrated Management of the Boianu-Sticleanu Polder

Under the agro-forestry program a total of 1,570 hectares as opposed with the total of 1560 hectares planned was planted in the erosion prone locations in the terrace areas and in the degraded areas in the polder. These were planted with acacia, poplar, willows and honey locust. Comuna satisfaction with these plantations was high so that by the end of the project farmers reported to plant wind breaks themselves.

The project supported the preparation of a Conservation Management Plan for the Iezer Calarasi Lake Nature Reserve. Following the approval of this plan by the Government, the project procured equipment needed by the local Environment Protection Agency (EPA) in Calarasi and by the Reserve custodian SC Piscicola Calarasi for activities related to the management of the nature reserve. The project also helped the custodian of the protected area to demarcate the boundary, to develop an information center, and to development a public awareness strategy. The Iezer Calarasi Lake nature reserve was functional by the end of the project implementation period.

(d) Strengthening the Soil and Water Quality Monitoring Capacity

The project strengthened the capacity of the Calarasi Water Management Service (SGA) and of the Soil Laboratory of Calarasi to monitor water and soil quality, respectively, as well as the impact on nutrient reduction of specific project actions (manure management, tree planting, application of the CGAP and others). Towards this, the project supported the incremental costs of selecting and maintaining monitoring sites and of equipment upgrading. Two national level courses were organized to train staff of the institutions involved in soil and water quality monitoring, and with the implementation of the EU Nitrates Directive.

Component 11: Strengthening of the National Policy and Regulatory Capacity

The project supported the MESD and the MARD in two main areas: (i) the application of the Nitrates Directive (cost assessment, methodology for diagnosis and action plan, training, national meetings, coordination among several institutions involved); and (ii) the development of the CGAP. Two additional Codes were developed based on requests from the ministries, namely the Code of Good Agricultural Practices and Environment Condition, and the Code of Best Farming Practices. The codes were approved through ministerial orders, published and disseminated in 12,000 copies.

Component 111: Public Awareness and Replication Strategy

A broad public information campaign of the project activities and benefits was undertaken at the local, national and regional levels. The public awareness campaigns are widely cited by local and national stakeholders as a critical factor in inducing the

behavioral changes necessary for the success of the project. This component organized a regional level conference to disseminate the information, hosted visitors from the neighboring countries, organized field trips and training for the institutions, mayors and farmers from other regions in the country and promoted environmental-.friendly agricultural practices through publications, exhibitions, social activities, promotional materials and working with children in schools.

The project provided considerable support to the Government of Romania in the newly approved developing Integrated Nutrient Pollution Control Project based on the experience gained. The project provided local information, and significant technical assistance in developing this new project to replicate its experience throughout Romania and to assist Romania in meeting its EU obligations regarding the Nitrates Directive. The project also provided support in developing similar projects in other countries in the region.

Component IV: Project Management

The Project Management Unit (PMU) was fully staffed before project effectiveness and the structure of personnel and the specialists initially hired remained unchanged during project implementation, except for the Procurement Specialist. The PMU provided effective technical leadership and efficient project administration.

Annex 3. Economic and Financial Analysis

The PAD in line with GEF requirements included an incremental costs analysis (ICA) of the project which predicted that the project would introduce and demonstrate more sustainable and environmentally benign technologies and practices at an estimated incremental cost of US$5.15 million over the baseline scenario. The project achieved this objective at the estimated incremental costs.[6]

The ICA enumerated among benefits associated with the project estimated annual savings of dissolved nutrients flowing into the Black Sea of 20kg/ha N and 2.5 kg/ha P. ***Ex-post*** analysis indicates that while nutrient leakage reduction has been realized but at significantly lower rate. The PIU calculated N and P leakage to groundwater in the project areas (69,011 ha of arable land) in 2005 and 2006. The calculation was based on increased spreading of manure on land and avoidance of excessive application of mineral fertilizers according the Code of Good Agricultural Practices. The PIU found that in 2005 avoided leakage was 1.9 kg N / ha and 1.6 kg P / ha. In 2006 the corresponding figures were estimated at 1.8 kg N / ha and 1.4 kg N / ha. A possible explanation for the large discrepancy is that the figure quoted in the PAD may have been derived from observations in other parts of Central and Eastern Europe in the early 1990s when drastic increases in prices of mineral fertilizers led to substantial reductions in their use.

To further evaluate the efficiency of the project, cost effectiveness (CE) ratios, defined as the cost of reducing one kg of N or P leakage into surface and ground waters were calculated for individual environment-friendly practices.

The CE ratios were calculated by dividing the monetary cost of implementing a practice by the total amount of leakage prevented through this practice in a particular area during a one year period. Leakage was estimated based on the difference of quantity of manure disposed on land improperly and conservative coefficients derived from international observations on release of nutrients from manure to soil. Costs taken included capital investment costs, maintenance and operation costs, and project management costs apportioned to the activity. Financial costs of the interventions were considered to equal economic costs due to insignificant market distortions. The estimation of annual leakages prevented due to the practice in question was based on the actual data reported by the project beneficiaries and provided to the PMU by the Department of Agriculture Calarasi.

The estimated CE ratios vary between US$10/kg and US$40/kg depending on the practice considered. At US$10/kg nutrient management was found to be the most cost effective practice, followed by strip crops and cover crops (US$12-15/kg.)[7] At US$30-40/kg manure management was the costliest practice, which is explained by the high initial capital cost.

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[6] Under more current GEF ICA practices, not only the GEF funded but also Government, beneficiary and other donor funded incremental costs would also be included in the analysis. Nevertheless, regardless of ICA methodology the project achieved its objective at estimated incremental costs.

[7] Estimates conducted by the PMU.

These CE ratios may be compared with those achieved in other parts of the world. In Poland, the CE ratios achieved by the World Bank funded Rural Environmental Protection Project in four regions ranged between US$18.5/kg N and US$24.8/kg N. These CE ratios are lower than the above estimates for the Romania APCP since they were calculated in present value terms with a discount rate of 10% and expressed in 2000 Dollars while the CE ratios in Romania are in current value terms.

These CE ratios are within the same range of CE ratios achieved in the Chesapeake Basin of the United States where comparable CE ratios were calculated. As the below table indicates the median CE ratio for manure management was US$30 per kg of N removed. This ration is roughly equivalent US$39/kg N in 2003 terms (table below). CE ratios were lowest in Romania for nutrient management. This phenomenon was also observed in the Chesapeake Basin.

Nitrogen reduction cost effectiveness rations achieved in the Chesapeake Basin (US$/kg N removed)*

	25 percentile	Median	75 percentile
Nutrient Management and Animal Waste Systems	10.4	19.5	28.6
Animal Waste Systems	20.8	39	58.5

Source: Adapted from Camacho (1992), p.38.

*** The CE ratios were adjusted for inflation using a GDP deflator of 1.30 from.1990 to 2003.**

It may be concluded that the CE ratios achieved in Romania are broadly in line with international experience.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Jitendra Srivastava	Lead Agriculturalist	ECSSD	Task team leadership and technical input
Doina Petrescu	Sr. Operations Officer	ECSSD	Technical input
Meeta Sehgal	Consultant	ECSSD	Technical input
Naushad Khan	Sr. Procurement Spec.	ECSPS	Procurement plan preparation
Arben Maho	Procurement Analyst		
Ranjan Ganguli	Sr. Financial Management Spec.	ECSPS	Financial management plan preparation
Bogdan Constantin Constantinescu	Sr. Financial Management Spec.	ECSPS	
Rohan Selvarathnam	Operations Analyst	ECSSD	Project costing
Stan Peabody	Lead Social Scientist	ECSSD	Social assessment
Dana Dobrescu	Consultant	ECSSD	Social assessment
Srish Kumar	Consultant	ECSSD	Project costing
Supervision/ICR			
Doina Petrescu	Sr. Operations Officer	ECSSD	Task team leadership
Nadia Badea	Operations Analyst	ECSSD	Technical input
Bogdan Constantin Constantinescu	Sr. Financial Management Spec.	ECSPS	Financial management supervision
Vladislav Krasikov	Sr. Procurement Spec.	ECSPS	Procurement supervision
Blaga Djourdjin	Procurement Analyst	ECSPS	
Ana Maria Ihora	Program Assistant	ECCRO	Organizational support
Jitendra P. Srivastava	Consultant	ECSSD	Technical input
Tijen Arin	Sr. Environmental Economist	ECSSD	Main author of ICR

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	US$ Thousands (including travel and consultant costs)
Lending		
FY99		6.22
FY00		169.82
FY01		117.42

FY02		46.60
FY03		0.00
FY04		0.00
FY05		0.00
FY06		0.00
FY07		0.00
FY08		0.00
	Total:	340.06
Supervision/ICR		
FY99		0.00
FY00		0.00
FY01		0.00
FY02		36.62
FY03		42.97
FY04		42.82
FY05		35.07
FY06		14.11
FY07		30.34
FY08		0.78
	Total:	202.71

Annex 5. Beneficiary Suwey Results

In the spring of 2007, a survey and in-depth interviews were carried out among stakeholders in the project region. The study aimed at assessing the project's impact on the target population and evaluated the level of use of environment friendly agricultural practices and of nutrient management plans, at the levels of both agricultural associations and individual households. The following are the key findings of the study:

- The number of associations involved in the project increased from 2005 to 2006. This increase was related mainly to the usage of the compost/manure collected from the households. The most frequently used environment friendly practices were crop rotation, seed selection, and use of pesticides and chemical fertilizers assisted by a specialist. However, association representatives mentioned difficulties in implementing these practices, including lack of an irrigation system, high costs of transportation and spreading on land of composted manure, and insufficient availability of composted manure.
- Among households that work the land themselves and that could use the environment friendly practices; the most frequently used environment friendly practices were crop rotation and seed selection. However the ratios were much lower than the ratio of associations. The key factor affecting level of implementation of such practices was found to be land size – the larger the land the more likely the household to use one of these practices.
- In 2006, households used crop rotation and expert-guided chemical fertilizer application more frequently than in 2005. Analysis of the evolution of environment friendly practices indicated that the largest increases brought about by the project were in expert-guided application of chemical fertilizers and pesticides and in natural windbreaks.
- Most of the problems encountered earlier with regard to garbage and manure management were solved thanks to the efforts of the APCP and of the local administration. Generally speaking the situation improved in project area with respect to waste and manure collection, storage, disposal. The approach to waste and manure management was considered appropriate. Water pollution was reduced as was the incidence of nitrite poisoning. Villagers were taking their garbage and collected manure to the commune's platform, consequently non-authorized platforms had disappeared and the general appearance of the villages has improved.
- Improper utilization of individual platforms and euro-bins was lower in 2007 than in 2005 and 2006, owing to the efforts of the local administration and the APCP. Local administrators controlled the use of the bins and platforms, while the APCP provided holey bins with wholes which made their use for food storage impossible. In four of the seven project communes, public service for waste and manure collection was operational and transported waste collected by households to the communal platforms. In the other three communes public authorities were at the tie of the study organizing the service with the support of APCP and of the County

Council. Three new communal waste and manure platforms were under construction, providing easier access for the local population for waste disposal.

- The project was relatively well known in the project region among households and other local stakeholders. The APCP was mainly identified as a project that assisted and had the entire community as beneficiary. The project's aim and results were primarily associated with garbage management. Data gathered, in particular qualitative data, suggested that project implementation was achieved without major difficulties.
- The project effects were perceived generally as positive. However, there were differences in stakeholders' perceptions of the project's sub-components. While environment friendly agricultural practices component was associated more with positive effects than the garbage management sub-component, its consequences seemed rather diffuse. On the other hand, the cleansing of the locality was perceived as the main benefit of the garbage management component by 72% of persons who answered the questionnaire and a large majority the persons interviewed.
- The project seemed to have positive consequences also at institutional level, mayoralties being the main beneficiary. Qualitative information suggested an improvement of relations between mayoralties and communes' citizens, and also an increase in local capacity to access and manage community development projects, due to experience gained in the project. According to data gathered (especially qualitative data), various activities were carried out to disseminate information about the project. Almost all communes reported of visits of representatives of institutions that could develop similar project (representatives of mayoralties from Călăraşi and neighbor counties).

Annex 6. Stakeholder Workshop Report and Results

Not applicable.

Annex 7. Summary of Borrower's ICR

Introduction

The Implementation Completion Report provides an:

- Assessment of the Project objective, design and implementation experience.
- Evaluation of the borrower's performance during the implementation of the Project, with special emphasis on lessons learned that may be relevant in the future.
- Evaluation of the performance by the Bank, the co-financiers and other partners during the evolution and implementation of the Project, including the effectiveness of their relationships, with special emphasis on lessons learned.

Assessment of the Project objective, design and implementation experience

Project Objectives

The overall project development objective is to increase significantly the use of environmentally-friendly agricultural practices in the project area and thereby reduce nutrient discharge from agricultural sources in Romania to the Danube River and Black Sea. The project was envisaged as a demonstration activity in the southern part of Romania, along the lower Danube, that may provide replicable lessons for introduction of similar practices in other zones of Romania as well as other Black Sea Riparian Countries.

This was a valid objective because, at the time, Romania was one of the major contributor to the Danube and Black Sea pollution with nutrients originating from agricultural activities and the Government needed assistance in order to honor its international obligations as well as moving Romania towards EU accession by addressing EU Directive 91/676/CEE regarding the water protection against pollution with nutrients originating from agricultural sources (Nitrate Directive). Many new farmers that had recovered their land in the early 1990s started to practice agriculture without having the necessary skills, experience and the appropriate equipment and therefore they started to seek advice on developing their farming enterprises. This was a good opportunity for the Project to offer them demonstrations on environment-friendly agricultural practices with low inputs, organic farming, manure management and nutrient management.

With regard to the communes, they were confronted with huge problems of pollution generated by the householders that in the 1990s started to grow animals inside the villages. This activity generated large amounts of manure improperly managed that was dumped mixed with inorganic and other household waste on agricultural lands, making them inappropriate for agriculture and a source of pollution with nutrients (mainly nitrogen and phosphorous) of the soil and water resources. There was a need to introduce, at the commune level, adequate manure management practices, supported with the necessary investments, equipment and training.

With regard to the drinking water quality, the population in the Project area was affected by the high nitrogen content and the exceeded acceptable levels for ***Streptococus fecalis***

and for fecal coli forms. Between 1996 and 1999, forty-five cases of acute nitrate poisoning were reported in the Calarasi County. In fact, all cases of acute nitrate poisoning in 1997 in Romania were in the Calarasi County.

Project Design

To achieve its overall objective, the Project was designed to: (i) facilitate the farmers' participation in the Competitive Grant Scheme organized by the Agricultural Services Support Project financed by the World Bank and implemented by the Ministry of Agriculture, with project proposals aiming the technology adaptation and extension interventions for environment-friendly practices; (ii) provide grants for the installation of improved manure storage facilities and equipment for manure collection and application in the seven comunas around Galatui Lake; (iii) promote the adoption of better agricultural practices that would improve agricultural production while reducing nutrient discharge pollution from agriculture; (iv) develop and support a specific land use management plan for the Boianu-Sticleanu Polder and the restoration of part of the Calarasi-Raul Polder; (v) strengthen the capacity of the local agencies (EPI, OJSPA and Public Health Directorate in Calarasi) to carry out soil and water quality monitoring programs; (vi) support the Ministry of Water and Environmental Protection (MWEP) and Ministry of Agriculture, Food and Forests (MAFF) for the application of the Nitrates Directive and harmonization of legislation with the requirements of the European Union, developing a Code of Good Agricultural Practices and strengthening the capacity of the National Authority for Ecological Agriculture; (vii) support public awareness campaigns at local level to familiarize the population and help induce the behavioral changes necessary to the success of the project in the seven selected comunas, and replication in the judet area, at national level, to disseminate the information concerning the benefits of the project activities and promote replication at national level and at regional level, in the Black Sea Riparian countries to promote the pilot project as a possible model for replication.

Implementation experience

Competitive Grant Scheme (total cost US$1,104,812): Several trainings were jointly organized by the PMUs of the APC and ASS Projects with the participation of the OJCA and DADR specialists, to provide guidance to farmers on the preparation of projects proposals, according with the provisions of the Operational Manual of the ASSP. Some 21 Concept Notes were submitted by farmers in Calarasi County and a number of three projects were eligible for the co-financing out of the APC Project. The training program provided regular interaction between the extension staff and the farmers. Farmers considered the disseminated information very useful for the preparation of project proposals not only for the CGS but also for other programs (PHARE, SAPARD) offering support on competitive basis. The awarded projects were well implemented and several technologies demonstrated were adopted by farmers.

Manure management (total cost US$ 5,065,400): This sub-component provided grants on a cost-sharing basis for the construction of village-level solid waste manure facilities and small storage platforms with effluent collection facilities at the household level, as well as for equipment for manure handling and spreading. The initial investment program

consisted in a number of 14 commune level manure platforms and about 4000 manure bunkers for the individual households. In addition, the USAID offered support for the design and construction of a pilot manure storage facility and the initial training for farmers, mayors and communes' specialists in manure composting and use. The collaboration with the Iowa State University provided useful support and information for refining the design of the manure platforms. The implementation of this sub-component has made an important impact on the behavioral changes of villages' inhabitants, farmers and local authorities. The construction of the commune level and of the individual platforms was done in a participatory manner, the beneficiaries being involved in all the construction stages. Training and awareness on good practices for manure collection, composting and use as organic fertilizer was provided to the operators of the platforms and to individual farmers. As a consequence of the good results obtained, the communes requested support for the construction of three additional platforms, and agreed to increase their part of co-financing in order to cover the construction costs. Finally, at the level of the communes the project financed a number of 18 manure platforms with a total storage capacity of 53,900 tons. At the household level the project financed a total of 2,250 individual platforms and, in order to help farmers to segregate the waste, 5,710 euro-bins were provided to the farmers. Also, each commune platform was provided with an office-container completely furbished, with water tank and toilet. The communities are fully using the platforms and the equipment and about 21 new working places were created. The percentage of households with livestock in the project area using village manure storage, household bunkers and segregating waste materials reached 54.4% compared to the baseline of 0%, and end-of-project target value of 45%.

Testing/Demonstration of the environment friendly agricultural practices (total value of US$ 311,832).

This sub-component provided support for (i) testing and demonstration of environment friendly practices; (ii) strengthening the capacity of the OJSPA to provide services and technical assistance for farmers related to the nutrient managernent plans, soil testing and monitoring the soil quality; (iii) training of farmers and OJCA staff on agricultural environment-friendly practices. The demonstrations were organized both in the Polder and the Terrace areas. The demonstrated practices included conservation tillage, shelterbelts/windbreaks, narrow vegetative barriers, filter strips, riparian buffers, nutrient management, agro-forestry, tree planting, grazing management, crop rotation and green fertilizers. In addition to these agricultural and agro-forestry practices there were organized demonstrations of the reclamation of the former unauthorized manure dumping places and recovering of the land for agricultural use. Also, demonstrations regarding the fountains head protection were organized and a number of 18 public wells where rehabilitated as an example of good practice to be used by householders. To support these demonstrations, the project provided the necessary planting materials and the specialized equipment for demonstration. Fourteen training sessions and field visits were organized with the participation of about 650 local farmers and specialists.

Regarding the rehabilitation of communes' pastures and improvement of the grazing management, the project provided support for the rehabilitation of 240 ha of pastures in the terrace area as well as in the Polder as demonstration of good practices. The project provided consultancy, selected seeds fixed and electric fences and mobile shelters for

pasture administrators. The communes' representatives received guidance from the PMU for organizing the controlled grazing management on the rehabilitated pastures. The brochure „Prescribed Grazing Management to Improve Pasture Productivity in New York" elaborated by the United States Department of Agriculture, Soil Conservation Service and Cornell University, Department of Animal Science, was translated from English and distributed to the communes to serving as a guide for preparing the grazing management plans. These demonstration pasture fields are being properly managed and used by the communities.

With regards to the Nutrient Management Plans, the Project provided support for the preparation of a methodology for elaboration of the plans at the farm level. As support for farmers, a Field Handbook containing information and guidance for the elaboration of the Nutrient Management Plans was prepared. The methodology has been extensively discussed with all the stakeholders and approved by the Inter-ministerial Commission for Nitrates Directive and the MAFRD. Also, the Nutrient Management Plans for 7 representative farms in the Project area and a training program for the farmers and specialists from OJCA, OSPA and DADR were carried on. The OJCA and OJSPA were provided with the computer program elaborated by the Project, for Nutrient Management Plans preparation. In order to strengthen the capacity of the OJSPA to perform soil tests, the project provided funds for minor rehabilitation of the laboratory, laboratory equipment, a four wheels vehicle and training of staff.

A survey regarding the use of the environment-friendly agricultural practices promoted under the APCP showed that the percentage of area under nutrient management systems including crop rotation, crop nutrient management with soil testing, and use of organic manures is 31%, compared to the baseline of 1%, and the end-of-project target value of 30%.

Integrated Management of Boianu-Sticleanu Polder and ecological restoration of part of Calarasi-Raul Polder (total value US$ 408,167).

The main activity was related to the implementation of the Conservation management plan of the Iezer-Calarasi nature reserve. The Project supported the elaboration and all necessary steps for approval through Government Decision of a Conservation Management Plan for the Iezer-Calarasi Avi-faunistic Protected Area. Also, the project procured the equipment needed by the local Environment Protection Agency (EPA) in Calarasi and by the Custodian SC Piscicola Calarasi for the activities related to the management of the protected area and helped the custodian of the protected area to demarcate the boundary, to develop an information center and a public awareness strategy and to implement the overall conservation plan. All these activities have been achieved and the Iezer Calarasi nature reserve is functional.

Under the agro-forestry planting program, an area of 1,569 hectares was planted with acacia, poplar, willows and honey locust as shelter belts, wind breaks, buffers on erosion prone location. Out of the 1,090 hectares initially planed to be planted in the polder, only 858 hectares were planted because the difficulties in transferring the lands from the State Domain Agency to the National Forestry Regia. For this reason, in consultation with the stakeholders the tree planting program, initially planed for the seven comunas, was extended at the County level and the remaining 232 hectares planned to be afforested in

the polder, were planted on the terrace area, as shelter belts and buffer strips. As result, on the Project area, the tree planting indicator was met in proportion of 103.4%.

The planting program was supported by an intensive training program addressed both to farmers and school children. It worth to be mentioned the large participation of the school children in the tree planting program.

The envisaged rehabilitation of the Calarasi-Raul polder could not be achieved because the feasibility study elaborated by the Danube Delta National Consulting Institute, revealed that the ecological restoration of part of the Calarasi – Raul Polder to the initial conditions (before building the dike and transformation into an agricultural polder) is not possible anymore due to the modification of the hydrological conditions of the Danube course. The potential ecological restoration of the Calarasi – Raul needs further consideration in the Danube Green Corridor context, subject to a more in-depth environmental and social assessment. Also, the funds provided in the Project were much below the estimated cost of restoration. The amount budgeted for the implementation and monitoring of the ecological restoration project for the Calarasi – Raul Polder was reallocated to other project components.

Strengthening the capacity of water quality monitoring at Calarasi County level (total value US$ 384,201).

The project interventions consisted in providing funds for the construction of a piezometers network covering the project area. The project also provided the necessary laboratory furniture, equipment, vehicle and training in order to create conditions for the laboratory accreditation. An intensive sampling and testing program of the ground and surface waters nutrients content was carried on by the Water Management Service and the tests results were used for the assessment of the impact of the project interventions for reducing the nutrients loss into the waters. The communes and farmers were regularly informed, direct and through the public awareness campaigns, about the water quality in the project area. The WMS staff participated to the courses organized by the project at national level, to train the staff of the institutions involved with soil and water quality monitoring, and the implementation of the EU Nitrate directive.

Strengthening the national regulatory capacity regarding the environmental policy (total value US$ 146,102).

The project supported the MWEM and the MARD for the application of the Nitrates Directive. The project provided support for: (i) assessment of the costs required for the implementation of the Nitrate Directive and elaboration of the methodology for diagnosis and action plan; (ii) training of the staff of the institutions involved in the implementation of the Nitrate Directive at national and local levels; (iii) national meetings and consultation with the stakeholders; (iv) development of the Code of Good Agricultural Practices, Code of Good Agricultural Practices and Environment Condition, and the Code of Best Farming Practices.

The methodology for diagnosis and action plans elaborated with the project support provided a better understanding of the role of each of the institutions involved in the Nitrate Directive implementation.

As regards the Codes of good agricultural practices, they were elaborated, approved through ministerial orders, published and disseminated in 15,500 copies. These codes are an important support for farmers willing to organize their agricultural activities in order to access the EU funds.

Public Awareness and Replication Strategy (total value US$ 416,141)

The public information campaign of the project activities and benefits was undertaken at three levels: (i) In Călăraşi County, in order to familiarize the population and to help inducing behavioral changes necessary for the success of the Project, in the seven communes selected and replication in the Project area; (ii) At national level, in order to disseminate the information regarding the benefits of the Project activities and promoting the replication at national level; and (iii) At regional level, in the Back Sea neighboring countries, for promoting the pilot Project as a possible replication model.

At the local level, the Project's objectives and results have been disseminated through activities organized in the communes from the Project area, promotional materials distributed to the participants to different contests on environmental friendly agricultural practices themes, publications dedicated exclusively to the "Agricultural Pollution Control" Project, different exhibitions organized with the participation of farmers and companies with activities in the area of organic agriculture. The public awareness campaigns have been a critical factor in inducing the behavioral changes necessary for the success of the project. In order to consolidate the new behavioral patterns, the farmers and the stakeholders were presented with the benefits of these activities. The staff of the County Centre for Agricultural Consultancy and other local institutions (OJCA, WMS, PHD, County Council) was trained regarding the use and the benefits of the environmental friendly agricultural practices, and were involved in the demonstration and the field visits, therefore becoming an important mean with regards to encouraging the adoption of these practices in the entire county even after the project closing date.

At the national level, several conferences and consultations with the stakeholders were organized in order to promote the project replication. The Project hosted visitors from other counties, organized project presentations and field visits for farmers from other regions in the country. The project achievements were promoted through publications, exhibitions, promotional materials and social activities.

The awareness campaign was successful in building a general good-will for the project and its benefits and raised the interest of the authorities, mayors and farmers from other counties towards the aims of the project. The project provided considerable support to the Government of Romania in developing a new project based on the experience gained during this project, named Integrated Nutrient Pollution Control (INPC). Thus the project has fulfilled its objective for replication at national level.

At the regional level the project provided for the participation to regional workshops, study visits and other activities to promote replication of project activities in other Black Sea riparian countries. A Regional Conference on Agricultural Pollution in the Danube, Baltic and Black Sea Basins was held in Bucharest in 2003. Under the regional replication efforts, the project supported the organization in Poland of a study tour of the mayors and farmers from Calarasi area.

Borrower performance and Lessons Learned

Project Management. The Project Management Unit was established and fully staffed before the Project effectiveness and, during the project life, provided effective technical leadership and efficient project administration. The structure of the PMU remained unchanged, except for the procurement specialist that left in the third year of the project, his tasks being taken by the Financial Manager and M&E Specialist. Given the pilot nature of the Project it inevitably took time to build understanding at all levels of MWEP and to put in place the appropriate management systems. The PMU has also played an important role in building a good relation with the Local Coordination Committee and Project beneficiaries. As result the project development objectives has been achieved, expected outputs in many cases exceeded and funds fully disbursed. The PMU worked continuous with the Bank Resident Mission and received guidance and support to resolve implementation issues as they arose.

Financial Management. The financial management of the project was highly satisfactory. The PMU has developed financial management software tailored for the project needs, with adequate security levels and its outputs were used to prepare quarterly financial monitoring reports of the project. The system is flexible and can be scaled up for the new World Bank supported Project - Integrated Nutrient Pollution Control. The project team uses a comprehensive set of accounting policies and internal control procedures in accordance with the Romanian legislation and the project financial management requirements. The financial procedures manual for the project has been subject to periodic updates and regular reviews by the Bank. Since the Project beginning, the PMU have been designated by the Implementing Agency, as third budgetary holder for the Project funds, which leaded to a successful, rapid and efficient implementation of the Project activities and a very good disbursement of the grant funds during the Project life. The PMU financial activity have been annually audited by independent auditors, acceptable to the Bank, and unqualified audit opinions, with no internal control problems have been issued at every report. The counterpart funds, from all sources, have been provided in time and necessary amounts. The budgetary funds have been provided quarterly, according to the PMU requests, in the limits allocated in the annual budgets. The local funds, from the Calarasi County Council and the seven beneficiary communes exceeded the amount initially allocated in the Project budget and the PMU collaboration with them have been highly satisfactory.

Procurement. The procurement capacity of the PMU was adequate for successful management of the Grant. The PMU was strictly followed Guidelines requirements and the quality of preparation of the documentation was good during the project implementation.

Project Monitoring and Evaluation. The Borrower has fulfilled its obligations with respect to monitoring and evaluation of the project. The project monitoring was done in accordance with the M&E Plan designed during project preparation and included in the Project Implementation Plan (PIP). The PMU has developed a comprehensive database including information related to the monitored indicators and prepared periodical progress reports. These reports were shared with the MEWM and the World Bank and the M&E results were used by the project management to address the implementation problems.

Lessons Learned. Several lessons were learned from the implementation of the project, namely: (i) for the components requiring beneficiaries' contribution (in cash or in kind), the early involvement of the stakeholders in project preparation is essential in order to ensure ownership and make them aware about the actual level of the effort necessary for the successful component implementation; (ii) the environmentally friendly agricultural practices included in demonstration programs should yield tangible benefits for the farmers, in order to ensure their adoption; (iii) the best way to convince the decision factors to support an activity that is new in the project area, are the demonstration visits to similar places where such kind of activities were successfully implemented; (iv) early efforts should be made to ensure the training of the project beneficiaries regarding the further use of the provided facilities; (v) the establishment of a local coordination committee, including representatives of the local authorities and of the beneficiaries, is the best solution for addressing the implementation issues; (vi) a public awareness campaign focused on the project objectives needs to be organized from the early stage of the project implementation.

Performance of the World Bank and Other Co-financers

The Bank's Resident Mission and Bank's supervision missions provided the needed assistance for resolving the problems occurred during the project life, and the ready accessibility of the Bank's team was particularly helpful in reaching timely decisions. The relation with Calarasi County Council and Beneficiaries worked very well and the funds were made available on a timely basis. There was a very good collaboration with USAID who provided funding for a pilot manure platform and a training program.

Implementing Agency Comments on Draft ICR

R O M A N I A

MINISTERUL MEDIULUI SI DEZVOLTARII DURABILE
MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
Cabinetul Secretarului de Stat Secretary of State Office
Nr. 9472 LAM/ 20 12 2007

Bucharest, 20 December 2007

Ms. Doina Petrescu
Senior Operations Officer
World Bank Office Romania

Dear Ms. Petrescu,

Referring to your letter, from 12th December 2007, concerning the Implementation Completion Report on Agricultural Pollution Control Project, I want to inform you that we do not have any comments to this report.

I take this opportunity to thank you and the World Bank Office Romania for the very good collaboration in the successful implementation of this project.

Yours sincerely,

SECRETARY OF STATE,
Lucia Ana VARGA

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

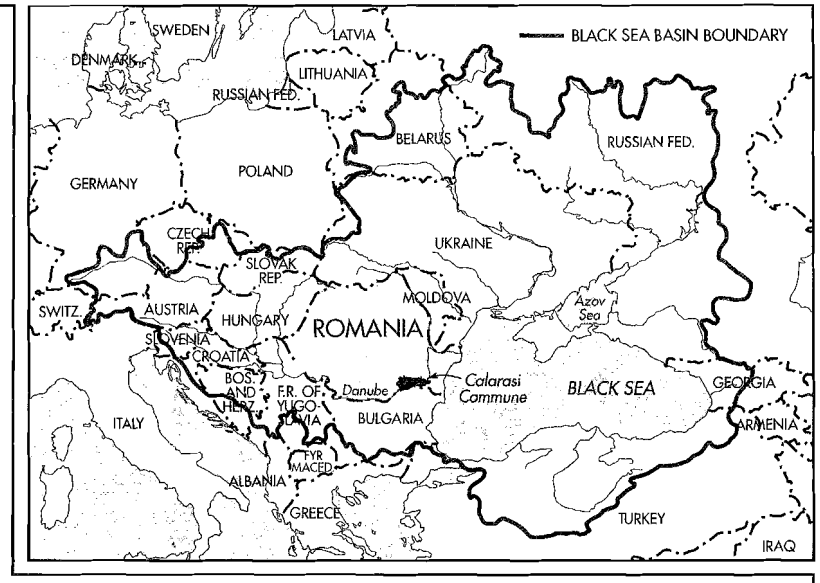
In the early project implementation phase, USAID contributed US$ 150,000 to the project with which a comuna platform was built. The ICR team attempted to contact the USAID Office in Bucharest in the first half of December 2007 for comments on the draft ICR. However, due to the phasing out of the USAID Office in Bucharest in progress and the Holiday Season, contact could be established with the officer in charge of cooperation with the APCP only on December 28, 2007. The team expects to receive comments on the ICR in early January and will file them in IRIS.

Annex 9. List of Supporting Documents

1. "Review of the Status of Implementation of the Environmental Management Plan Agreed at the project Appraisal (October 18 – November 18, 2004)" by Dr. Violeta Visan, Consultant for the World Bank, Bucharest, Romania.
2. "The monitoring of Social Effects of the Agricultural Control Project. A report for the Ministry for Environment and Water Management." by Malina Voicu, Monica Constantinescu and Vlad Grigoras. Romanian Academy Research Institute for Quality of Life. Bucharest, May 2007.
3. Estimation of Nutrient Reduction. Excel Sheet produced by the PMU. "Nutrients Reduction.xls".

MAP

ROMANIA
COMMUNAS PARTICIPATING IN MANURE MANAGEMENT



PROJECT AREA - TERRACE
BOIANU - STICLEANU POLDER
CALARASI - RAUL POLDER

COMMUNAS
TOWNS
COUNTY (JUDET) HEADQUARTERS
COMMUNA BOUNDARIES
TOWN BOUNDARIES
COUNTY (JUDET) BOUNDARIES
INTERNATIONAL BOUNDARIES

IALOMITA
BUCURESTI
GIURGIU
CONSTANTA
BULGARIA

Ileana
Belciugatele
Tarnaveni Mare
Fundulea
Lehliu
Nicolae Balcescu
Lehliu-Gara
Dor Marunt
Sarulesti
Dragos Voda
Dragalina
Perisoru
Stefan cel Mare
Fundeni
Gurbanesti
Valea Argovei
Lupsanu
Valcelele
Vlad Tepes
Stefan Voda
Borcea
Plataresti
Sohatu
Frasinet
Jegalia
Frumusani
Vasilati
Nana
Al. Odobescu
Independenta
Cuza Voda
Unirea
Ulmu
Budesti
Soldanu
Luica
Gradistea
Dichiseni
Roseti
Dorobantu
Manastirea
Cioconesti
Modelu
Cureani
Radovanu
Mitreni
Ulmeni
Chiselet
Spantov
Cascioarele
Chirnagi
OLTENITA
CALARASI
BOIANU - STICLEANU
CALARASI - RAUL
PILOT AREA
Danube
Danube

NOVEMBER 2001
IBRD 31608

ROMANIA

AGRICUCIURAL POLLUTION CONTROL PROJECT

COMPONENT II AND III PROJECT AREA

COMPONENT I, II AND III PROJECT AREA

DANUBE RIVER

BLACK SEA BASIN BOUNDARY

MAJOR ROADS

SELECTED CITIES

COUNTY (JUDET) CENTERS

NATIONAL CAPITALS

COUNTY [JUDET] BOUNDARIES

INTERNATIONAL BOUNDARIES

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