Document of
The World Bank

Report No: ICR00002381

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IBRD-47410, TF-53306)

ON A

LOAN
IN THE AMOUNT OF US$ 15.70 MILLION

AND A

GLOBAL ENVIRONMENTAL FACILITY GRANT
IN THE AMOUNT OF US$ 7.0 MILLION

TO THE

REPUBLIC OF TURKEY

FOR THE

ANATOLIA WATERSHED REHABILITATION PROJECT

December 28, 2012

Sustainable Development Unit
Europe and Central Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective November 19, 2012)

Currency Unit = Turkish Lira (TL)
TL 1.00 = US$0.55
US$ 1.00 = TL 1.80

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AWRP	Anatolia Watershed Rehabilitation Project
EAWRP	Eastern Anatolia Watershed Rehabilitation Project
BCPCPS	Beneficiary-Centered Problem Census Problem Solving Method
CAS	Country Assistance Strategy
CIMMYT	International Maize and Wheat Improvement Center
ECA	Europe and Central Asia
EMP	Environmental Management Plan
ERR	Economic Rate of Return
EU	European Union
FMR	Financial Management Report
GDRS	General Directorate of Rural Services
GEF	Global Environment Facility
IBRD	International Bank for Reconstruction and Development
ICARDA	International Center for Agricultural Research in Dry Areas
ICPDR	International Commission for the Protection of the Danube River
IPM	Integrated Pest Management
ISR	Implementation Status and Results Report
JICA	Japan International Cooperation Agency
MARA	Ministry of Agriculture and Rural Affairs (Tarim ve Koy Isleri Bakanligi)
M&E	Monitoring and Evaluation
MC	Micro-catchment
MCIT	Micro-catchment Implementation Team
MEF	Ministry of Environment and Forestry (Cevre ve Orman Bakanligi)
NPV	Net Present Value
PAD	Project Appraisal Document
PMG	Project Management Group
PMU	Project Management Unit
SPO	State Planning Organization (Devlet Planlama Teskilati)

Vice President:	Philippe Le Houérou
Country Director:	Martin Raiser
Sector Manager:	Kulsum Ahmed
Project Team Leader:	Nathalie W. Johnson
ICR Team Leader:	Meeta Sehgal

REPUBLIC OF TURKEY
Anatolia Watershed Rehabilitation Project

CONTENTS

A. Basic Information			
Country:	Turkey	Project Name:	Anatolia Watershed Rehabilitation Project
Project ID:	P070950, P075094	L/C/TF Number(s):	IBRD-47410, TF-53306
ICR Date:	11/20/2012	ICR Type:	Core ICR
Lending Instrument:	SIL, Grant	Borrower:	REPUBLIC OF TURKEY
Original Total Commitment:	USD 20.00M USD 7.00M	Disbursed Amount:	USD 15.15M USD 6.98M
Revised Amount	USD 15.70M, USD 7.00M		
Environmental Category: B, B		**Focal Area**: International Waters	
Implementing Agencies: Ministry of Environment and Forestry			
Co-financiers and Other External Partners:			

B. Key Dates				
Anatolia Watershed Rehabilitation Project - P070950				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	10/26/2001	Effectiveness:	12/21/2004	12/21/2004
Appraisal:	06/23/2003	Restructuring(s):		
Approval:	06/01/2004	Mid-term Review:		05/29/2008
		Closing:	06/30/2012	06/30/2012

Anatolia Watershed Rehabilitation Project (GEF) - P075094				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	10/26/2001	Effectiveness:	01/04/2005	12/21/2004
Appraisal:	06/23/2003	Restructuring(s):		
Approval:	06/01/2004	Mid-term Review:	10/15/2008	05/29/2008
		Closing:	06/30/2012	06/30/2012

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes	Satisfactory
GEO Outcomes	Satisfactory
Risk to Development Outcome	Low or Negligible
Risk to GEO Outcome	Low or Negligible
Bank Performance	Satisfactory
Borrower Performance	Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	**Ratings**	**Borrower**	**Ratings**
Quality at Entry	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
Overall Bank Performance	Satisfactory	Overall Borrower Performance	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Anatolia Watershed Rehabilitation Project - P070950			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating:**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA)	None
DO rating before Closing/Inactive status	Satisfactory		

Anatolia Watershed Rehabilitation Project (GEF) - P075094			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating:**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA)	None
GEO rating before Closing/Inactive Status	Satisfactory		

D. Sector and Theme Codes

Anatolia Watershed Rehabilitation Project - P070950		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Agro-industry	13	13
Central government administration	9	9
General agriculture, fishing and forestry sector	50	61
General water, sanitation and flood protection sector	15	15
Irrigation and drainage	13	2

Anatolia Watershed Rehabilitation Project - P070950	Original	Actual
Theme Code (as % of total Bank financing)		
Environmental policies and institutions	13	13
Other environment and natural resources management	25	25
Other rural development	25	25
Pollution management and environmental health	24	24
Regional integration	13	13

Anatolia Watershed Rehabilitation Project (GEF) - P075094		
	Original	Actual
Sector Code (as % of total Bank financing)		
Agricultural extension and research	7	7
Central government administration	10	10
General agriculture, fishing and forestry sector	60	60
General water, sanitation and flood protection sector	23	23
Theme Code (as % of total Bank financing)		
Other environment and natural resources management	50	50
Pollution management and environmental health	50	50

E. Bank Staff		
Anatolia Watershed Rehabilitation Project - P070950		
Positions	**At ICR**	**At Approval**
Vice President:	Philippe H. Le Houerou	Shigeo Katsu
Country Director:	Martin Raiser	Andrew N. Vorkink
Sector Manager:	Kulsum Ahmed	Marjory-Anne Bromhead
Project Team Leader:	Nathalie Weier Johnson	Peter A. Dewees
ICR Team Leader:	Meeta Sehgal	
ICR Primary Author:	Meeta Sehgal	

Anatolia Watershed Rehabilitation Project (GEF) - P075094		
Positions	**At ICR**	**At Approval**
Vice President:	Philippe H. Le Houerou	Shigeo Katsu
Country Director:	Martin Raiser	Andrew N. Vorkink
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ICR Team Leader:	Meeta Sehgal	
ICR Primary Author:	Meeta Sehgal	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)
The overall development objective is to support sustainable natural resource management practices in 28 micro-catchments in Anatolia and Turkey's Black Sea Region and thereby raise incomes of communities affected by resource degradation

Revised Project Development Objectives (as approved by original approving authority)
Not applicable.

Global Environment Objectives (from Project Appraisal Document)
The key global environment objective is to introduce farming practices which will reduce the discharge of agricultural nutrients into surface and ground water in watersheds draining into the Black Sea in four provinces.

Revised Global Environment Objectives (as approved by original approving authority)
Not applicable.

(a) PDO 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 :	Increase in vegetative cover in project MCs			
Value (quantitative or Qualitative)	Not specified in PAD	Above baseline by 20% by midterm, and 50% by closing (about 34,000 ha by project closing)		58,000 ha (74% above baseline by project closing)
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target exceeded. By project closing, increase in vegetative cover was 74% above baseline. As baseline and targets were established for each MC during preparation of MC plans, no baseline was established at appraisal.			
Indicator 2 :	Increase in soil fertility on sloping lands in project MCs			

Value (quantitative or Qualitative)	Sainfoin: 275kg/da Chickpea: 90kg/da Alfalfa: 1080 kg/da	Increase soil fertility by 10% above the baseline by mid-term and 20% by closing		Increase in productivity of sainfoin by 182%; chickpea by 89% and alfalfa by 18%
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target exceeded. Crop productivity of sainfoin, chickpeas and alfalfa were used as proxies for measuring improved soil fertility. Baseline and targets were set at the time of each MC plan preparation. It must be noted that several external factors also contributed to such improvements in soil fertility. However, it can be safely assumed that project interventions targeted towards this outcome were important contributors to improvements in soil fertility in the project area.			
Indicator 3 :	Increase in household incomes in participating MC communities			
Value (quantitative or Qualitative)	An average of 4,200 Turkish Lira in project MCs	10% above baseline by mid-term and 40% by closing		An average of 6,500 Turkish lira (average increase 53% above baseline by project closing)
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target exceeded. By project closing, household income increases averaged 53% above baseline. It must be noted that several external factors also contributed to such increases in income levels in the project area. However, it can be safely assumed that project interventions targeted towards this outcome were significant contributors to improvements in household incomes in the project area.			

(b) 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 :	Adoption of environment-friendly practices (e.g. crop rotation, crop nutrient management with soil testing, use of organic matter)			
Value (quantitative or Qualitative)	Virtually no farmers assumed to be using environmentally friendly agricultural practices at project launch	At least 30% of farmers in project micro-catchments in Black Sea provinces adopting environmentally friendly agricultural practices		30% of farmers in target areas have adopted environmentally friendly agricultural practices
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target met.			
Indicator 2 :	Adoption of improved manure handling and storage facilities			
Value	0	55 -60% of		60% of farmers in

(quantitative or Qualitative)		farmers in pilot areas adopting improved manure handling and storage facilities		areas where such practices were piloted adopted improved manure handling/storage practices
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	The target was met by project closing. 381 units of household and farm-level and 10 central-level manure storage facilities were established.			

(c) 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 :	MC plans developed and fully implemented			
Value (quantitative or Qualitative)	0	28		28
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target met. 100% achievement. All MC plans were developed and implemented in a timely manner			
Indicator 2 :	Farmers in MCs provided with training in new agriculture based income generation /diversification activities.			
Value (quantitative or Qualitative)	0	60% of farmers in project MCs provided with training in new agriculture-based income generation/diversification activities		83% of farmers in project MCs trained.
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target achieved at project closing exceeded target set at appraisal.			
Indicator 3 :	Training in support of organic farming and marketing of organic products provided			
Value (quantitative or Qualitative)	0	Training programs in organic farming and marketing of organic products in place and provided in all		Training provided in all 28 project MCs

		micro-catchments		
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target achieved. 166 farmers in the 28 MCs participated in organic farming training sessions			
Indicator 4 :	Development and adoption of packages of investments and practices for nutrient discharge			
Value (quantitative or Qualitative)	0	65% of farmers with nutrient management problems in target MC adopt nutrient management practices		3,500 farmers trained. 90% of farmers adopted nutrient management practices in the target MCs.
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target achieved exceeded target set at appraisal.			
Indicator 5 :	Water quality monitoring program developed and implemented (for IBRD-supported activities)			
Value (quantitative or Qualitative)	No water quality program in place	Institutional and regulatory mechanisms in place supporting water quality monitoring program at 100 stations		140 stations established in 14 MCs
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target achieved exceeded target set at appraisal. 140 stations established - 57 for groundwater and 83 for surface water. Ten parameters are monitored.			
Indicator 6 :	Water quality monitoring program developed and implemented (for GEF-supported activities)			
Value (quantitative or Qualitative)	No water quality program in place	Institutional and regulatory mechanisms in place supporting water quality monitoring program at 35 sites.		29 monitoring points established
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	83% of target achieved.			
Indicator 7 :	Development and promotion of legal framework consistent with the EU Nitrates Directive for good agricultural practices based on on-farm trials, demonstrations,			

	and trainings.			
Value (quantitative or Qualitative)	No legal framework in place. No trials and demonstrations underway	Turkish legislation with respect to nitrates pollution to be harmonized with the EU Nitrates Directive. Demonstrations and farm trials completed and impact evaluated. 39 demonstrations planned.		Turkish legislation harmonized with the EU Nitrates Directive. 143 demonstrations carried out on nutrient management practices
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target met. Regulation #25377 published in official Gazette which seeks to protect waters against agricultural pollution. Government is developing instruments for implementation/enforcement of legislation. Demonstrations exceeded target set at appraisal.			
Indicator 8 :	Increased public awareness of causes, effects and mitigating measures of natural resource degradation			
Value (quantitative or Qualitative)	Not specified in PAD	Not specified in PAD		Public awareness campaign carried out in all 28 MCs.
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target met. Public awareness campaign was undertaken through a variety of mechanisms to reach communities in project MCs, including brochures, posters, TV spots, as well as demonstration programs on field plots.			
Indicator 9 :	Public Awareness Campaign for reduction of nutrient discharge measures developed and implemented			
Value (quantitative or Qualitative)	Not specified in PAD	No target specified in PAD		Public awareness program in place and implementation ongoing in 14 MCs of the Back Sea provinces under the project. 27000 persons belonging to 4600 households directly contacted.
Date achieved	12/21/2004	12/21/2004		06/30/2012
Comments (incl. % achievement)	Target met. Through public awareness activities, such as demonstrations, information materials farmer awareness on nitrate pollution was increased.			

G. Ratings of Project Performance in ISRs

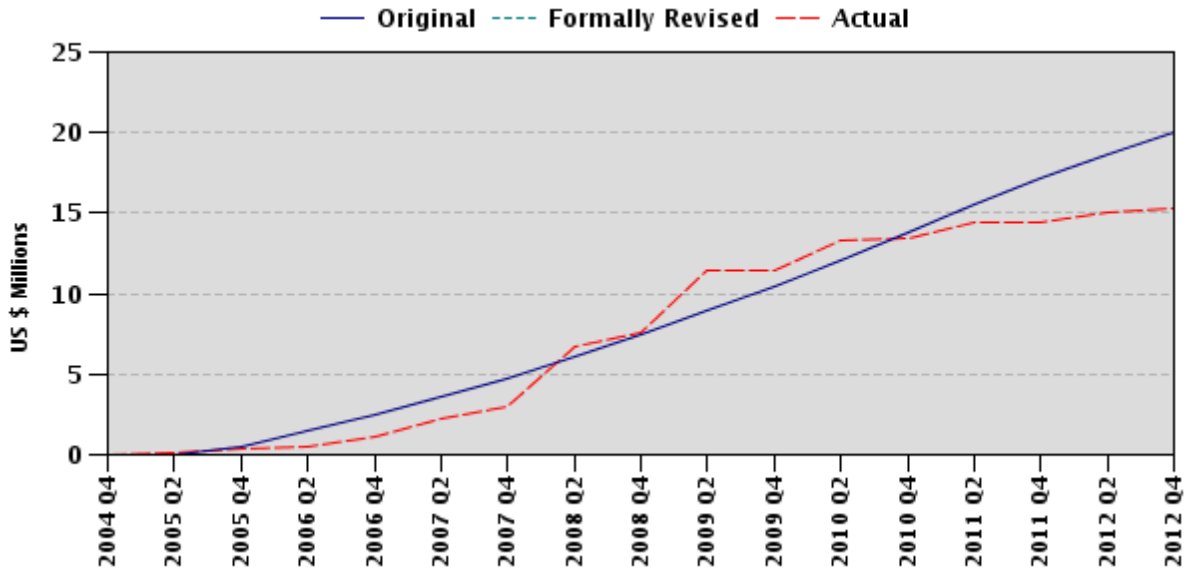
-						
No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (USD millions)	
					Project 1	Project 2
1	06/29/2004	S	S	S	0.00	0.00
2	10/14/2004	S	S	S	0.00	0.00
3	05/18/2005	S	S	S	0.35	0.25
4	10/25/2005	S	S	S	0.35	0.25
5	06/14/2006	S	S	S	1.10	0.84
6	10/11/2006	S	S	MS	1.38	1.43
7	06/28/2007	S	S	MS	2.92	2.32
8	06/19/2008	S	S	MS	7.60	3.59
9	12/24/2008	S	S	MS	11.41	3.59
10	06/03/2009	S	MS	MS	11.41	3.59
11	03/01/2010	S	S	S	13.31	5.00
12	11/27/2010	S	S	S	14.40	5.02
13	06/26/2011	S	S	S	14.40	5.03
14	11/18/2011	S	S	S	14.99	5.68
15	06/13/2012	S	S	S	15.34	7.00

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile

P070950



Note: US$0.10 million and US$4.20 million were canceled in November 2004 and 2005 respectively. The revised loan amount was US$15.70 million.

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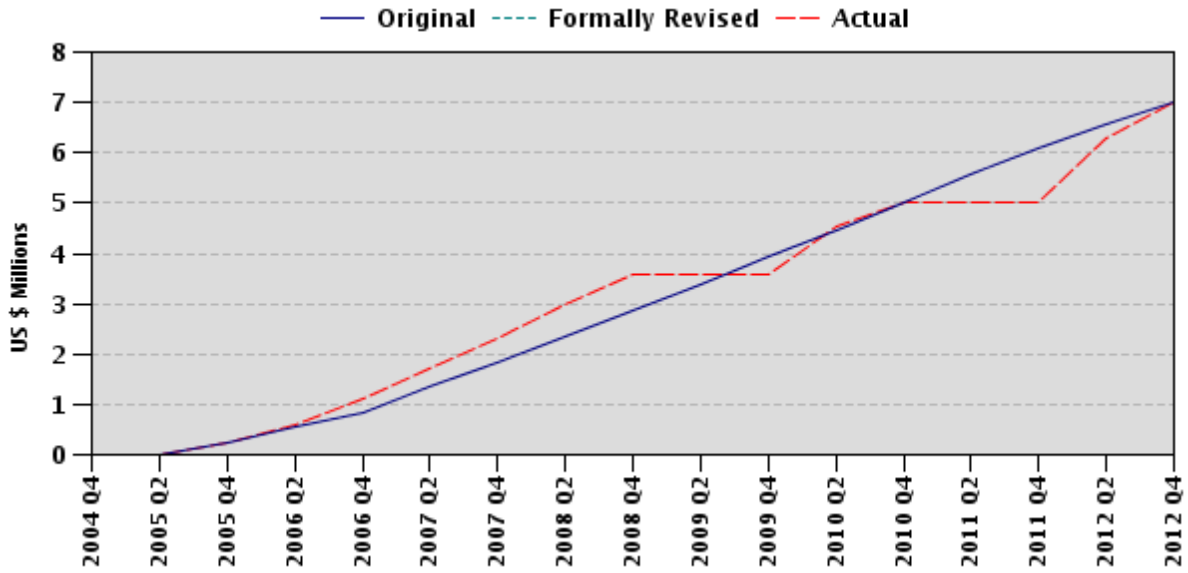

1. Project Context, Development and Global Environment Objectives Design

1.1 Context at Appraisal

1. In the early 2000s, the Government of Turkey launched an ambitious economic reform program to create the basis for stable economic growth and set the stage for the country's entry into the EU. In the rural sector, this included a reform program that would, *inter alia*, increase Turkey's agricultural competitiveness, protect its natural resources, build capacity towards meeting EU standards and ensure improved livelihoods for the poor. In addition to introducing structural reforms to improve the agricultural support system, the Government emphasized the need for promoting sustainable natural resource management in rural areas and integrating environmental concerns in rural land management. The country's environmental strategy, articulated through the National Environment Action Plan (NEAP) specifically called for improving agricultural practices and reducing soil and water pollution from agricultural sources which were leading to widespread natural resource degradation and significantly affecting the quality of forestry land, carrying capacity of rangeland and fertility of agricultural land.

2. Under the Bank-supported, "Eastern Anatolia Watershed Rehabilitation Project" (EAWRP)[1], the Government had successfully introduced a more holistic and participatory approach to natural resource management on a watershed basis to "restore sustainable range, forest and farming activities in three provinces[2] in the upper Euphrates watershed, reducing soil degradation, erosion and sedimentation in reservoirs as well as increasingly productiveness and incomes in this impoverished region of Turkey". The project was the first of its kind in Turkey whereby it piloted a multi-sectoral, community-driven approach to natural resource rehabilitation at the micro-catchment level, pioneered collaborative work between rural development agencies and demonstrated linkages between sustainable natural resource management and improved rural livelihoods.

3. While the EAWRP yielded overall positive outcomes in sustainable natural resource management in target micro-catchments, the Government of Turkey indicated its interest for a follow on operation to test further innovative approaches in rural land management and natural resource rehabilitation. It was particularly keen to mainstream environmental considerations in agriculture and pilot agricultural pollution control measures, including the reduction of nutrient loads to soil and water bodies from agricultural sources within a watershed management framework. These efforts would not only assist with addressing natural resource degradation issues in the country, but also initiate critical work towards compliance with the EU environmental *acquis* and relevant directives, such as the Nitrates Directive which is an integral part of the Water Framework Directive. In this context, Turkey, as a signatory to the *Convention on the Protection of the Black Sea against Pollution*, also had an international obligation to reduce nutrient pollution to the Black Sea. Excessive use of chemical inputs in agriculture (pesticides and inorganic fertilizers) was identified as the main source of nutrient pollution in Turkey's rivers draining into the Black Sea and thereby significant contributors to the growing problem of eutrophication in the Sea (Black Sea Region Trans-boundary Diagnostic Analysis – 1996).

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[1] Turkey Eastern Anatolia Watershed Project (1993-2001). Project ID P009023.

[2] Eight additional provinces were included during project implementation.

1.2 Original Project Development Objectives (PDO) and Key Indicators (as approved)

4. The project's overall development objective was to support sustainable natural resource management practices in 28 micro-catchments in Anatolia and Turkey's Black Sea Region and thereby raise incomes of communities affected by resource degradation.

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

5. The key global environment objective was to introduce farming practices which would reduce the discharge of agricultural nutrients into surface and ground water in watersheds draining into the Black Sea in four provinces.

6. The hierarchy of objectives and key performance indicators in the Project Development Objective (PDO) and Global Environment Objective (GEO) section of the PAD Annex 1: Project Design Summary is provided below:

Hierarchy of Objectives	Key Performance Indicators
Project Development Objective: To introduce sustainable natural resource management practices in 28 degraded micro-catchments (MCs) and thereby raise incomes of communities affected by resource degradation **Global Environmental Objective:** To introduce farming practices which will reduce the discharge of nutrient and other agricultural pollutants into surface and groundwater in watersheds draining into the Black Sea	**Outcome / Impact Indicators** : • Increase in vegetative cover in project MCs above baseline by 20% by the midterm and by 50% by closing • Increase in soil fertility on sloping lands as measured by humus content in project MCs from 10% above the baseline by the midterm and by 20% by closing. • Increase in household incomes in participating MC communities by 10% above baseline at midterm and by 40% at closing • Increased public awareness of causes, effects and mitigating measures of natural resource degradation as measured by awareness surveys • Adoption of environment-friendly practices (e.g. crop rotation, crop nutrient management with soil testing, use of organic matter) by 30% of farmers in 4 Black Sea Provinces • Adoption of improved manure handling and storage facilities by 55%-60% of farmers in areas where such practices are piloted

1.4 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

7. Not applicable

1.5 Revised GEO (as approved by original approving authority) and Key Indicators, and reasons/justification.

8. Not Applicable

1.6 Main Beneficiaries

9. The main beneficiaries identified in the PAD included the following:

- Farmers and rural households living in degraded micro-watersheds
- Communities living downstream of degraded areas
- Non-farming households in watersheds emptying into the Black Sea riparian countries
- Commercial beef-fattening and dairy producers in peri-urban areas of the Black Sea region
- Agro-processors and commercial farmers
- Ministry of Agriculture and Rural Affairs (MARA) and Ministry of Environment and Forestry (MEF)

10. The primary target group was the rural population of about two million residing in the 28 selected MCs. With the exception of MCs in the lower watersheds in the four Black Sea Provinces, MCs included in the project were primarily located in rural mountainous areas. Many of the 400 or so villages in the project area were classified as "forest villages"[3] with limited access to good agricultural and range land. Most households in the region relied on crop and livestock production as their main source of income, with forest villagers supplementing their income with forestry-based work at the project's inception. Household incomes in the project area were significantly below the average rural household income in Turkey and many households remained largely in the subsistence economy.

1.7 Original Components (as approved)

11. The project consisted of the following components, none of which were revised during project implementation:

12. **Component 1: Rehabilitation of Degraded Natural Resources (US$23.5 million).** This component provided support for the planning and implementation of a menu of activities to be implemented by village communities under the direction of the MEF and MARA, in partnership with communities. The component's primary objective was to protect degraded areas from further degradation, erosion and pollution. Rehabilitation interventions were focused around four sub-components as outlined below and implemented in 28 micro-catchments in six provinces (Tokat, Sivas, Kayseri, Corum, Samsun and Amasya provinces). The activities included a specific program for piloting actions on reducing nutrient discharge to the water bodies that were implemented in the lower parts of watersheds of four participating Black Sea provinces using GEF funds (Samsun, Tokat, Corum and Amasya). The main sub-components were as follows:

(i) *Rehabilitation of forest land* including soil conservation by afforestation, protection and improvement of poor & degraded soils, gallery plantation, rehabilitation of oak coppices and of degraded high forests, participatory replanting and inventory of non-wood forest products.
(ii) *Rangeland Rehabilitation*, including improved management of forest rangelands and rehabilitation activities on rangeland outside the forest land.

[3] Forest villages are defined as villages which are surrounded by forest areas on four sides and have state forests within their administrative borders. 'Communique on Issues Regarding to Development of Development Services of Forest Villagers', Gazette Number 26040, dated December 31, 2005.

(iii) *Rehabilitation of Agricultural Land*, including: fallow reduction, appropriate use of marginal agricultural land, wild tree grafting, river bank protection, and construction and production on agricultural terraces.
(iv) *Environmentally friendly agricultural practices*, including demonstrations of improved crop production practices, organic farming and Integrated Pest Management and nutrient reduction activities implemented.

13. With regard to the environment-friendly practices, implementation of selected activities to reduce nutrient discharge into water bodies in the lower watersheds of participating Black Sea provinces were financed by the Global Environment Facility (GEF) grant, by Government and by beneficiaries.

14. **Component 2: Income Raising Activities (US$17.57 million).** Under this component target communities were offered a menu of activities designed to raise household incomes in return for participation in conservation activities supported under Component 1. Income generating activities were designed to provide participating communities with the incentives to undertake conservation efforts even if they incurred short- or medium-term costs (e.g. short-term closure of range lands, closure of forest land) or if benefits could only be reaped in the long run (afforestation). The menu offered varied in accordance with agro-ecological and socio-economic conditions in each village, as well as with farmers' resources and needs. The main income generating activities included small-scale irrigation including creation of small irrigated perimeters and farm ponds; investments in livestock improvement, greenhouses and small-scale freshwater fisheries implemented; and farm and crop enterprise diversification (including rain-fed and irrigated horticulture, irrigated forage crops, vegetable production, planting trees on field boundaries, agricultural processing and beekeeping).

15. **Component 3: Strengthening Policy and Regulatory Capacity towards meeting EU Standards (US$0.28 million).** This component provided support for implementing the following three sub-components:
(i) *Support for the Application of the EU Nitrates Directive* through the monitoring of nitrate levels at selected sites in the four Black Sea provinces, as first step in implementing the nitrates directive.
(ii) *Development and Promotion of a Code of Good Agricultural Practices* based on on-farm trials, demonstrations and training. The preparation and application of this code is a mandatory part of the nitrates directive program.
(iii) *Institutional Support for Organic Farming:* The project provided technical assistance to strengthen the institutional capacity in support of producing and marketing organically produced farm products.

16. **Component 4: Awareness Raising, Capacity Building and Replication Strategy (US$1.06 million):** This component included the following sub-components:
(i) *Public Awareness in Micro-catchment Development:* This was designed to raise awareness amongst target beneficiaries and other stakeholders about the program approach and terms of participation in Micro-catchment development. The goal was to increase transparency in program implementation and empower beneficiaries to demand program services.
(ii) *Public Awareness, Capacity Building and Replication Strategy:* With regard to the four Black Sea provinces, the component provided capacity building and public awareness activities at the local, national and regional level, for the training of beneficiaries and participating institutions as well as for the future replication of similar activities in Turkey and other Black Sea riparian countries.

17. **Component 5: Project Management and Support Services (US$2.5 million):** This component had the following sub-components:
(i) *Project Administration:* This sub-component supported the technical assistance, financial services, logistical and operational requirements necessary to ensure the appropriate and efficient administration o f project activities and resources by central and provincial project management units.
(ii) *Support Services:* This sub-component funded extension, technical assistance and some study tours for project managers, technical project staff and farmers.
(iii) *Monitoring* & *Evaluation System:* The project provided for the upgrading of the existing Monitoring and Evaluation system.
(iv) *Fund for applied research and technology dissemination:* This sub-component would finance short-term, small scale applied research on soil, water, crop, natural resource management, agricultural pollution, livestock and forestry focusing on MC environment.

18. The GEF Grant specifically financed: (a) promotion of environmentally friendly agricultural practices under Component 1: Rehabilitation of Degraded Natural Resources; (b) Component 3: Strengthening Policy and Regulatory Capacity toward Meeting EU Standards; (c) Public Awareness and Replication Activities under Component 4; and (d) relevant Project Management and Support Services.

1.8 Revised Components
19. Not applicable

1.9 Other significant changes

20. Cancellation of Loan Proceeds. In August 2004, the Bank's Board of Executive Directors approved a 50 basis points waiver of the front-end fee for all IBRD loans (other than Special Structural Adjustment Loans) presented to the Board between July 1, 2004 through June 30, 2005, with retroactive effect to all loans presented to the Board on or after March 1, 2004. As a result of this waiver, the front-end fee for the AWRP loan was reduced from US$0.20 million to US$0.10 million. Accordingly, a amount of US$0.1 million of the loan was canceled in November 2004.

21. Additionally, an amount of US$4.20 million of the IBRD loan was canceled in November 2005. These funds had been allocated for the provision of small-scale irrigation services by the General Directorate of Rural Services (GDRS). However, a few months after project implementation got underway, GDRS was abolished and its responsibilities were transferred to the Special Provincial Administrations (SPAs). While Treasury made funds available to the SPAs to undertake rural developmental activities in the provinces, these funds were "generic" and could not be earmarked for specific activities. The SPAs utilized their budget funds for activities that were accorded a higher priority by the government (such as rural roads and drinking water supplies) with limited allocations for small-scale irrigation works. Moreover, the legal framework prevented Treasury from on-lending funding from foreign-financed projects to SPAs that could have then mandated the use of project funds for small-scale irrigation services that had been agreed at project appraisal. The Bank team as well as implementing agencies sought to get these funds re-allocated to other project activities; however, Treasury formally requested a cancelation of this portion of the IBRD loan in November 2005.

22. Amendment of Loan Agreement. In 2009, the Loan Agreement was amended to include solar hot water heating system as an eligible investment under MC plans. Given the low demand

for greenhouses and fisheries development, especially in the upland catchments where conditions did not support such activities, these two activities were dropped from the menu of investments and replaced with a technical innovation in domestic energy use, namely, solar water heating systems.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

23. The project drew on the successes and lessons learned under the Eastern Anatolia Watershed Rehabilitation Project (EAWRP) as well as agricultural pollution control projects funded under the Black Sea-Danube Strategic Partnership Program for Nutrient Reduction in other countries such as Romania, Poland and Moldova. Project design was grounded in community participation whereby communities jointly identified principal resource management issues and selected priority interventions that were most appropriate for their specific MC conditions. A noteworthy feature of project design was that the MC plans were to be developed on a rolling basis. Such sequencing provided an opportunity to assess performance of previous plans, gauge "what works" and "what doesn't", and feed this knowledge into the next round of MC plans. Also, a flexible approach was adopted to revise MC plans as necessary to respond to changing circumstances and evolving needs of communities.

24. The project design included new and innovative approaches to address natural resource rehabilitation and management on a watershed basis. Agricultural pollution control and animal waste management for nutrient reduction to soil and water bodies in the MCs of the Black Sea provinces had not been tested by the Government before. Inclusion of this activity, funded by the GEF, would not only improve soil and water resources in the project area but also help to initiate critical work towards meeting obligations under the EU Nitrates and Water Framework Directives.

25. AWRP carried over the institutional arrangements under EAWRP for project implementation and built on the strong inter-agency collaboration pioneered under EAWRP. In all, two ministries (MEF and MARA) and seven directorates were directly involved in project implementation. These challenging implementation arrangements were justified as project activities were cross-sectoral, covering a broad spectrum of interventions related to agriculture, livestock, forestry, and environment. Responsibilities of each ministry/directorate were clearly spelled out so that there was no ambiguity with "who does what" during implementation. Additionally, for each micro-catchment, a Micro-catchment Implementation Team (MCIT) was established with relevant staff from all seven provincial directorates to assist communities develop MC plans. Establishing an MCIT was a useful institutional arrangement as communities had limited knowledge and skills for collective action on natural resource rehabilitation, environmentally friendly agricultural practices and animal waste management.

26. The project's Quality at Entry was satisfactory. All implementation arrangements were in place with the Project Management Group, Operations Unit, Project Management Units, Provincial Project Management Teams and Micro-catchment Implementation Teams established and fully staffed as necessary. The Project Coordinator was also appointed. In addition, the Government had developed a detailed Project Implementation Plan (PIP) that was appraised as realistic and of satisfactory quality by the Bank team. The engineering design documents as well as procurement documents for the first years' activities were complete and ready for start of project implementation. Reporting formats for M&E were agreed upon and finalized. The MCITs had begun working with potential beneficiaries to develop MC plans. In fact, five MC

plans were developed during project preparation so that when the project became effective, implementation of the plans could be launched immediately.

2.2 Implementation

27. Overall, project implementation was smooth. This was primarily due to: (i) continuous support and commitment from national and local counterparts for project activities; (ii) emphasis on a participatory process for implementation of all key activities; (iii) built-in flexibility to respond to changing needs; (iv) compliance with Bank's safeguard and fiduciary requirements; (v) timely availability of GEF, Government and local funds; and (vi) full cooperation among all implementing agencies. By project closing, 100% of the GEF grant funds and 98% of the IBRD loan proceeds were disbursed.

28. The five MC plans prepared during project preparation were launched as soon as the loan and grant became effective. All through project implementation, the MC plans were phased in in a timely manner and implemented on schedule. The MCITs worked effectively with the communities to tailor MC plans to the priorities and available resources of the communities. Regular meetings were held among all key institutional stakeholders to address project issues jointly and in a timely manner.

29. The project was responsive to changing needs and circumstances which ensured smooth implementation. Given the low demand for greenhouses and fisheries development, especially in the upland catchments where conditions for such activities were relatively poor, the menu of investments for MC plans in these areas was revised. This was a positive aspect of project design: it allowed for rapid adjustments to respond to specific conditions. These two activities were dropped from the menu and resources freed up to finance those that the communities expressed a greater demand for, namely, solar water heating systems. Also, an increase in the price of cattle and sheep over the second half of the life of the project was straining the MC plan funding envelope and the provision of solar water heating system was a viable option to include in the menu of investments for the remaining MC plans. The solar water heating system was especially welcomed given the significant benefits accruing from its adoption: economic (low cost), social (labor and time saving, especially for women with regard to fuel wood collection and heating water for cooking and cleaning) and environmental (forest wood protection, clean renewable energy source). The Loan Agreement was accordingly amended to include solar hot water heating system as a menu of investment under MC plans.

30. When it became evident that the allocation for the implementation of the sub-component *Fund for applied research and technology dissemination* whereby the project would finance demonstrations and trials of conservation tillage activities in the project areas was not sufficient to contract CIMMYT and/or ICARDA as was originally planned, MARA stepped in to undertake these specific activities and the funds for these activities were re-allocated to purchase equipment to support the promotion of good agricultural practices. Such sound and timely adjustments contributed to efficient project implementation.

31. No project restructuring was necessary although about one-fifth of the loan was canceled. Cancelation of the small-scale irrigation sub-activity did not affect the PDO and/or the key outcome indicators, or threaten the accrual of potential benefits to the target MC communities. Given that GDRS was abolished within the first year of project implementation, only the first round of MC plans were impacted. Some communities had selected investments that might have benefited from the provision of small-scale irrigation services. However, the project's built-in

flexibility allowed these communities to modify their MC plans and adjust their stream of benefits in keeping with the project's objective.

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

32. During preparation, it was agreed that at the time of development of each MC plan, baseline information for that MC would be gathered, and targets would be established to measure successful implementation/achievements of the MC plan. However, while extensive data and background information was collected during the preparation of the MC plans, there were delays with compiling, aggregating and analyzing it in a way that would establish a sound baseline for the MC plan and subsequently allow evaluation of outcomes of selected investments. There were also some delays in collecting baseline data with regard to soil and water quality monitoring.

33. The Bank team sensitized the implementing agencies to the importance and urgency of establishing a quality baseline during its supervision missions and followed up closely with the Government. The team correctly rated M&E as moderately satisfactory or moderately unsatisfactory to reflect these inadequacies in the M&E system. The PMU subsequently hired a consultant to develop a computer program for consolidating all project monitoring information and aggregating the data in a meaningful way which would allow for measurable, systematic reporting on project achievements. In 2008, critical points to measure water and soil quality in the Black Sea provinces were also established. Such delays have compromised the actual measurement of achievements in some instances.

34. Activity and process monitoring was detailed and thorough throughout the life. The implementing agencies diligently tracked outputs achieved under each project component. It was agreed that an assessment of project outcomes would be undertaken over the last three months of project implementation and the findings shared with the Bank team by September 15, 2012. Although the Bank team is still awaiting these findings from the Government, there is sufficient data and anecdotal evidence available to make an informed assessment of overall project outcomes (See Section 3.2).

35. It is also important to note that the flexibility provided to communities to revise their MC plans to respond to changing/unforeseen circumstances meant that baselines and targets were fluid. The aim was not to have the project be a target-driven operation but one that responded to communities' priority needs in the areas of natural resource rehabilitation and income generation. Overall, MC plans performed well due in part to the rolling basis of MC plan development. The lessons learned from preceding plans were fed into the preparation and implementation of subsequent plans which improved the quality of the MC plans and increased the likelihood of their success.

2.4 Safeguard and Fiduciary Compliance

36. The safeguards triggered under the project included: Environmental Assessment (O.P. 4.01), Forestry (O.P. 4.36), Pest Management (O.P. 4.09) and Safety of Dams (O.P. 4.37).

37. No major safeguard issues arose during project implementation. The project was classified as an Environmental Category B (Partial Assessment) project because although it generally supported environmentally sustainable development, some activities, such as manure platform construction, could have some direct environmental impacts, albeit of insignificant scale and easily mitigated. The norms for mitigating and monitoring such impacts were defined in the project appraisal document (PAD) which referred to an Environmental Management Plan (EMP)

that was based on a Regional Environmental Assessment (REA) disclosed in 2003. The dam safety and pest management safeguards were not monitored because no applicable activities were undertaken during implementation. Since the small-scale irrigation works were eventually dropped, the dam safety safeguard was no longer applicable. Also no dam higher than 15 meters was constructed under the project which would have triggered the safeguard. Similarly, the pest management safeguard was not applied as participatory processes leading to MC plans did not identify any activities that would use the controlled chemicals identified in the EMP. The Environmental Assessment and Forestry safeguards remained relevant because of the afforestation, rangeland improvement, and manure management initiatives. Compliance with provisions of both safeguards was satisfactory throughout project implementation.

38. Financial Management. Regular Bank team financial management reviews confirmed a satisfactory financial management system during the life of the Project. Satisfactory internal controls and procedures ensured reliable accounting records and safeguarded project resources and assets. Financial Management Reports (FMRs) for each quarter were submitted to the Bank on a timely basis in agreed content and format. Audit reports contained unqualified opinions and no significant accountability of internal control issues were identified. As some transactions were executed in 2012, the final project audit report is due on June 30, 2013. Counterpart financing was satisfactory during the life of the project.

39. Procurement. At appraisal, procurement risk was rated high. With increased decentralization of responsibilities for procurement management, lack of strong technical backstopping and quality control in the PMU to provide assistance to decentralized units, and frequent staff changes, overall procurement capacity remained relatively weak. This required the provision of continuous training (and re-training) in Bank's procurement rules and guidelines. The procurement staff in the Country Office provided much needed training and support throughout the life of the project and was instrumental in preventing any major procurement delays during implementation.

40. Disbursement. In the early stages of project implementation, the requirement that project disbursements required approval by the Central Accountancy Unit caused delays in contractual payments. Part of the reason was that provincial staff was not wholly familiar with procedures required, so errors were made that needed to be rectified, resulting in lengthy and extensive correspondence. The PMU consequently held procurement and financial management training for project staff while at the same time developed streamlined procedures for approving payments and disbursements. Overall, disbursements were smooth and there were no significant lags.

2.5 Post-completion Operation/Next Phase

41. ***Transitional Arrangements***: The development and implementation of MC plans was designed to provide MC communities with full ownership of project investments. No transitional arrangements were necessary under the project as assets procured by the project were used by the local beneficiaries from the date of acquisition during the implementation period. The communities were fully responsible for operation and maintenance of investments provided for by the project (in fact they had to agree to do so as a condition of the project proceeding at a particular site).

42. ***Next Phase***. There were some discussions during project implementation to scale up AWRP to other watersheds of Turkey. However, given that there were several discrete and disparate watershed management projects ongoing in the country, the Government decided to first develop a consolidated approach and strategy for watershed management at the national level to

facilitate more effective targeting of investments. To this end, it is currently developing a *National Water Basin Management Strategy* with Bank assistance. The exercise is expected to include the development of a methodology for integrating the cumulative impact assessment of water usage installations in river basins in the current legislation, effective monitoring and evaluation tools, and more effective targeting of investments using social, environmental, and economic criteria. The positive achievements under AWRP are contributing to informing the strategy.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

43. The project's objectives, design and implementation continue to be highly relevant to Turkey's current development priorities. The Ninth Development Plan (2007-2013), indicates, *inter alia*, the need for protecting the environment and ensuring development in rural areas in line with EU processes. A strategic objective of the National Rural Development Strategy (2007-2013) is *Protection and Improvement of the Rural Environment*. Two priorities under this objective include: (i) Improvement of Environment-friendly Agricultural Practices, towards which the Government aims to undertake measures for, *inter alia*, developing integrated agricultural basin programs, expanding organic agriculture and good agricultural practices, implementing and diversifying environmentally friendly production methods, monitoring environmental pollution arising from agricultural activities, developing agricultural land and pastures; and (ii) Protecting Forest Ecosystems and Sustainable Utilization of Forest Resources towards which the aim is to undertake measures for, among others, accelerating forest cadastre works, alleviating the pressure of animal husbandry on the forests, protecting biodiversity of ecosystems and sustainable utilization of biological resources, forestation and soil preservation works.

44. Currently, Turkey's natural resources face increasing pressures from growth in energy use, industry, transport, tourism, and agriculture which are resulting in water stress, soil erosion and pollution. Land degradation, for example, has become increasingly severe, with more than 59 percent of Turkey's land area suffering from severe erosion, and forest cover now at 26 percent, down from 70 percent originally. While the AWRP initiated critical work in select areas to promote sustainable natural resource management and reduce land degradation, much work remains to be done. Measures to address these challenges continue to remain a priority as reflected in the national development plans and strategies as well as in the current Country Partnership Strategy (FY12-15) through which the country has sought Bank assistance to address some of these challenges. The CPS has been designed to "contribute to Turkey's goal of fast, sustainable and inclusive growth that respects the environment" and towards this, builds on three main strategic objectives and pillars: (i) enhanced competitiveness and employment; (ii) improved equity and public services; and (iii) deepened sustainable development. One of the projected outcomes of pillar (iii) is *strengthened environmental management and adaptation to climate change.* In this context, the Government of Turkey is working to promote sustainable and equitable resource management and environmental protection in an integrated manner. This effort also includes the completion of the National Basin Management Strategy that would inform future investments in watershed management.

45. The project's objective of reducing the discharge of agricultural nutrients also remains a global environment priority. Reducing nutrient pollution in the Black Sea continues to be a priority in the region. As a member of the Black Sea Commission, Turkey is obligated to implement the principles of the *Strategic Action Plan for the Environmental Protection and*

Rehabilitation of the Black Sea which call for "sustainable management of the natural resources and biodiversity of the Black Sea" and includes the *polluter pays principle*. The International Commission for the Protection of the Danube River (ICPDR) and the Black Sea Commission have developed guidelines for achieving good environmental status in the coastal waters of the Black Sea, in line with EU legislation. Turkey will need to implement these guidelines. Also, as a signatory to the Convention on the Protection of the Black Sea from Pollution, the Government has an obligation to meet its international commitments with regard to improving the environmental status of the waters of the Black Sea.

3.2 Achievement of Project Development Objectives and Global Environment Objectives

46. The project development and global environmental objectives of the project were fully achieved. All expected outputs were achieved and all key performance indicators met end-of-project targets, with several exceeding end-of-project targets (See Data Sheet and Annex 2).

47. Overall, project outcomes are assessed as positive. AWRP successfully tested the efficacy of community-level, demand-driven, participatory approaches to natural resource rehabilitation and management within the framework of watershed rehabilitation and resulted in providing a replicable model for sustainable watershed management in Turkey.

48. The participatory process of MC plan development and implementation fostered cooperation among villagers and brought them together to organize themselves around common goals. It empowered communities to make their voices heard and promoted collective decision making for community-level issues. These processes have instilled a sense of self confidence in the villagers and increased their sense of communal responsibility.

49. Conservation activities under components 1 and 2 (rehabilitation of forestry land, rangeland and agricultural land) have increased vegetative cover, improved soil fertility and helped to combat soil erosion in the project area. Improvements in agricultural productivity are evident with increases in crop yields, which in some cases have nearly doubled, as in the case of sainfoin, where yields increased by 182%. It is expected that forest land rehabilitation will, over time, produce wood and other forest products which would be critical for communities who depend on the forests for their livelihood. Similarly, with increases in rangeland cover and improved quality of grazing land, livestock farmers are benefiting from higher milk yields and improved quality of dairy and livestock products which not only have economic implications but social/health as well. By increasing vegetative cover and combating soil erosion, there is anecdotal evidence that the project had an impact on sedimentation of small dams close to the treatment area and of reduced village flooding during high rainfall events. Also, it can be reasonably supposed that the increases in vegetative cover are contributing to increased carbon sequestration in the target areas.

50. While poverty alleviation was not an explicit objective of the project, it contributed to raising incomes in some of the poorest regions of the country. Implementation of natural resource rehabilitation and farm diversification measures, such as beekeeping, helped in job creation, generating employment as well as raising household incomes of targeted beneficiaries. If interventions related to rehabilitation and protection of forestry land, rangeland and agricultural land as designed under the project, as well as farm-diversification activities are continued by project beneficiaries (and adopted by those in non-project areas), there is a strong likelihood of gradual and continual improvements in land productivity and increases in rural household incomes in the project area (and beyond).

51. The project increased knowledge and promoted critical behavioral changes among communities with regard to natural resource protection. Public awareness programs on the causes, effects and mitigation measures for natural resource rehabilitation were undertaken in all 28 project MCs. Additionally, several training and demonstration programs were held for stakeholders on, *inter alia*, environmentally friendly agricultural practices, sustainable manure management, organic farming and farm diversification activities. One instance of such behavioral change is evident in MCs of the Black Sea provinces where promotion of manure management activities has led to significant behavioral modifications with regard to manure disposal. In several villages, farmers voluntarily formed associations to collect, store and manage their stock of manure. Most livestock farmers in the project area no longer store manure close to their homes or backyard wells. Storage structures are now mostly enclosed to ward off odors and flies.

52. The increased uptake of manure management activities has resulted in positive environmental, financial, environmental and social outcomes. Water and soil quality monitoring indicates that there is a reduction in nutrients in soil as well as surface and ground water in the target areas. Among participating farmers, purchase of fertilizers has reduced as they are now using composted manure. This translates to substantial financial savings for the farmer. Also, the fertilizers purchased were usually chemical in nature that increased nitrate pollution and degraded soil and water quality. The appropriate application of manure is not only helping to protect the quality of soil and water in the project area, it has boosted organic farming which is economically more lucrative than conventional farming. With Turkey's proximity to the European market, organic farming is expected to increase among farmers. Another positive outcome of sustainable nutrient management has been the immediate impacts on local sanitation. Reduced nutrient loads to ground waters have also resulted in health benefits by contributing to the improved quality of drinking water.

53. The project has had an excellent demonstration/spill-over effect. During project implementation, communities, both within and outside the project area, participated in the training and demonstration programs, and visited MCs where project results were visible to learn first-hand the economic and ecological benefits of activities accruing to the beneficiaries. This had the positive result of generating interest and support for project investments and underscores the high potential for project replication. In fact, AWRP is already serving as a replicable model for sustainable watershed management in Turkey and has helped mobilize funding for watershed management involving intensive targeting of selected micro-catchments. For instance, one can discern little difference in approach between the AWRP and IFAD-funded Murat River Watershed Rehabilitation Project and JICA-supported Coruh Watershed Rehabilitation Project both of which aim to promote sustainable natural resource management and improved livelihoods within a watershed rehabilitation framework, using community-based participatory approaches.

54. A positive outcome of the international training programs (study tours to Poland, Germany, Romania, Moldova, etc.) for nutrient management activities was the introduction of technical innovations in the areas of livestock waste management in Turkey. Liquid manure injection equipment, though relatively common elsewhere, was the first of its kind in Turkey after it was fabricated locally, based on designs identified during visits to other countries as part of the project-supported study tours. In this context, Turkey also hosted the "Integrated Nutrient Pollution Management Workshop", one in a series of workshops organized by countries receiving GEF support under the Danube-Black Sea Strategic Partnership Program. The workshop provided an excellent forum of the exchange of ideas and experiences with agricultural pollution control, and nutrient management practices in particular, that served to enhance the knowledge and skills of participating project team members. It also hosted the workshop on: *Integrated Participatory*

Watershed Rehab Techniques in Degraded Lands, where participants included representatives from a wide range of countries from around the globe. These events have served to enhance Turkey's visibility on the international stage as a serious partner with regard to protecting the natural resources of the planet.

55. An outcome not anticipated at the time of project preparation was the technical innovation in domestic energy use, namely, solar hot water heating systems. This investment in renewable energy not only contributed to the achievement of the project objective of natural resource protection and conservation, but also provided a low cost energy alternative to target project beneficiaries. Estimates suggested that households in upper catchments used as much as $20m^3$ of firewood per year; solar hot water heating systems reduced consumption by as much as one-third. Since solar water heaters are low-cost, it helped increase participation rates in the overall program and broadened the environmental impacts of switching from fuel wood to solar water heaters. The social benefits were also considerable. By reducing time required to collect firewood for water heating, household labor time was freed up for other activities and in this context, women benefited considerably. Additionally, animal waste was also used as a source of clean renewable energy in one project province. The project supported the construction of two small-scale biogas digesters in Corum. These were used as demonstration sites for farmers and mayors from other MCs with a view to spurring interest for replication.

56. The project thus achieved its overall objectives and yielded positive results. It was a pilot operation that mainstreamed environmental considerations in forestry, rangeland and agricultural land management and demonstrated the value of integrated, synergistic work across rural sectors. With replication of project activities (such as increases in vegetative cover and improved soil quality), the potential for continued and additional positive outcomes, such as increased agricultural productivity and more profitable sustainable agriculture, improved incomes, lowered flood risks, reduced vulnerability to droughts, reduced sedimentation to local lakes close to treatment areas and further downstream, and fewer landslides, is expected to grow. It must be noted, however, that reducing nutrient loads to the Black Sea is a long-term undertaking and a coordinated, multi-country effort. The project contributed to this objective by reducing nutrient loads in local soil and water bodies at the micro-catchment level, which only when replicated on a much larger scale will result in any significant reductions of nitrogen and phosphorous from Turkey's waters to the Black Sea.

3.3 Efficiency

57. The original Turkey AWRP cost-benefit analysis (CBA) was largely driven by the costs and benefits of the first two project components dealing with: (a) rehabilitation of degraded natural resources; and (b) income generating activities. The first component accounted for the major part of project costs while the second, but much smaller component contributed the bulk of the project benefits. Comparison of AWRP with other watershed rehabilitation experiences in Turkey suggest that an indicative and partial re-computation of the project efficiency parameters (ERR, NPV and B/C ratios) could be based on the key project component (degraded natural resource rehabilitation). This course of action was adopted by updating some of the base data found in existing analyses coupled with data borrowed from other projects to reconstitute the flood control benefits which were initially underestimated. In addition to this adjustment, the opportunity cost of capital was lowered to 6% from 12%.

58. The re-computed ERR - based on rather conservative assumptions - was around 14%, with NPV of US$15.5 million and B/C ratio of 4.3.

3.4 Justification of Overall Outcome and Global Environment Outcome Rating
Rating: Satisfactory

59. Overall project outcome is rated satisfactory as the project successfully achieved its objectives and yielded positive outcomes. It contributed to restoring degraded lands in the project areas where little interventions, if any, had been undertaken to protect the region's natural resource base, successfully initiated nutrient management activities that would ultimately contribute to reducing nutrient loads to the Black Sea, and helped increase incomes of participating communities in the project areas that were characterized by a high incidence of poverty.

3.5 Overarching Themes, Other Outcomes and Impacts

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

60. While poverty alleviation was not an explicit objective of the project, it contributed to raising incomes in some of the poorest regions of the country. Implementation of natural resource rehabilitation and farm diversification measures helped to generate employment as well as raise household incomes of targeted beneficiaries. If such project interventions are continued by project beneficiaries (and adopted by those in non-project areas), there is a strong likelihood of gradual and continual improvements in land productivity and increases in rural household incomes in the project area (and beyond).

61. The PAD stated that during the process of developing MC plans, both during identification of problems and solutions, particular efforts will be made to encourage women's participation so as to assure that gender issues are mainstreamed into MC planning and implementation. Although specific monitoring of gender involvement and impacts was not undertaken during project implementation, empirical evidence shows that that women involvement in MC planning and implementation was low. However, the introduction of the solar water heating system in the menu of interventions for MC plans was of much benefit to women. It reduced time and labor for fuel wood collection as well as heating water for household chores and freed up time for other activities.

62. On the whole, the project was of high significance in terms of social capital building. The project served as an inclusive tool bringing villages and communities together to organize themselves around common goals and mange their resources more sustainably. It promoted collective decision-making at the community level. The participatory approach fostered self-confidence and a sense of empowerment among beneficiaries and provided them an opportunity to make their voices heard.

(b) Institutional Change/Strengthening

63. The project provided a valuable framework to bring together staff from different ministries and agencies to work together on natural resource rehabilitation and management issues. While such joint work was initiated under EAWRP, AWRP reinforced and strengthened inter-ministerial and inter-directorate cooperation for more effective service delivery to communities, especially in some of the poorest regions of Turkey.

64. The decentralized implementation arrangements also helped ministry staff at the provincial level gain experience in communicating and collaborating with farmers, and this marks

an important shift in the relationship between government and the rural population both in the project MCs and more widely. There is a good likelihood that the enhanced institutional coordination and collaboration, and improved central and local institutional capacity, has increased the possibility of continued partnerships between MEF and MARA for similar operations.

65. The project also built technical and managerial capacity of institutional staff through improving and upgrading existing levels of knowledge and skills in key aspects of natural resource management and environmentally friendly agricultural practices. By participating in in-country formal and informal training sessions as well as international study tours and workshops, key implementing agency staff increased their competencies and know-how in critical areas of environment, agriculture and rural development.

(c) Other Unintended Outcomes and Impacts (positive or negative)

66. None

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

67. Not applicable

4. Assessment of Risk to Development Outcome and Global Environment Outcome Rating: Low

68. The assessment of risk to development and global environment outcomes is rated low. By demonstrating the efficacy and value of project activities, and building awareness and capacity at both at the national and local levels, there is a high likelihood of ongoing support for project outcomes beyond the life of the project. The rationale for this is summarized below:

(i) There is *continuous commitment to appropriate economic, financial and sector policies* on the part of the Government as evidenced in its development strategies, including the Agricultural Strategy, National Environment Action Plan and the Country Partnership Strategy.
(ii) The MC planning and implementation process has *educated beneficiaries* to the importance of protecting the natural resource base and the need for collaborative work across sectors to harness effective and sustainable benefits. It has *empowered beneficiaries* to identify and implement their priorities at the community level and this increased capacity and awareness is likely to engender continued interest and commitment for project outcomes. Beneficiary surveys have indicated that communities are indeed eager to continue with the kinds of interventions supported under the project.
(iii) The *low-cost technologies* promoted under the project will encourage continuation and replication of project activities.
(iv) The *enhanced institutional capacity and coordination mechanisms* among ministries and directorates at the national and provincial level is likely to remain as the government recognizes the merits of a multi-sectoral approach to reducing natural resource degradation and the need to work across sectors for sustainable solutions. In 2011, through an institutional reorganization, the government has already moved to promote better linkages among ministries and directorates in this area.
(v) *EU membership* mandates compliance with the EU Nitrates Directive as well as the implementation of agri-environment measures (EU payments can be received by farmers only if they keep their land "in good agricultural condition") so the likelihood of the

government and beneficiaries continuing with the promotion and implementation of environmentally friendly agricultural practices, including activities for nutrient reduction and management, is high.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry
Rating: Satisfactory

69. Bank's performance during preparation was satisfactory. The team built on the good work already performed under EAWRP and reflected the lessons learned in project design. It went a step further by linking agricultural pollution control activities to natural resource management which was innovative approach sought by the government and welcomed by local beneficiaries. There was good cooperation with the counterparts at the national and local level which resulted in smooth preparation at every stage. Regular stakeholder consultations ensured that there were full agreements on project design, scope and activities. Most importantly, the team ensured that communities in the targeted micro-catchments were actively involved in identifying the menu of interventions for the MC plans which was critical for project success.

70. Five MC plans were developed during preparation to ensure that the project hit the ground running as soon as it became effective. All implementation arrangements were in place at project start.

(b) Quality of Supervision
Rating: Satisfactory

71. The Bank team closely supervised project implementation. Supervision missions were conducted on average twice a year, which allowed for fairly regular face-to-face interaction on project issues. Supervision reporting was thorough and progress towards achievement of the key performance indicators was regularly updated to reflect project status. Next steps and follow up action were agreed upon in detail with counterparts. These were included in the mission Aide Memoires and Implementation Status and Results Reports (ISRs) and closely tracked.

72. Throughout the duration of the project, the team maintained a regular and constructive dialogue with the PIU, central and local government agencies, as well as the MC communities. Its pro-active approach in managing and resolving issues that arose during implementation helped to keep project activities on schedule.

(c) Justification of Rating for Overall Bank Performance
Rating: Satisfactory

73. Overall Bank performance is rated satisfactory. The team worked closely with central and local government counterparts as well as target communities all through preparation and supervision of the project. Its pragmatic and flexible approach contributed to a well-designed project as well as successful project implementation.

5.2 Borrower Performance

(a) Government Performance
Rating: Satisfactory

74. Government performance was satisfactory. As a sign of its commitment from the start, the government largely prepared the project. Relevant staff from MEF and MARA, both at the central and local level, worked closely and cooperatively throughout the project's duration, ensuring continual and effective coordination to execute their specific responsibilities. The provincial governments worked closely with the communities to ensure that their voices were adequately represented in the MC planning and implementation process, and that the investments selected were in the best interest of the communities and consistent with project objectives. Government staff participated in several training programs and study tours to enhance knowledge and capacity for natural resource rehabilitation and nutrient management. The government actively promoted awareness of potential project benefits not only in the project MCs but also at the national level to foster increased adoption and replication of project activities. Timely counterpart financing throughout the project's life contributed to satisfactory disbursement performance. In the event of any issues/challenges that arose during implementation (such as dissolution of GDRS), the Government consulted closely with the Bank team in seeking the most optimal resolution that would not jeopardize project implementation.

(b) Implementing Agency or Agencies Performance
Rating: Satisfactory

75. The performance of the Project Management Group, Project Management Unit and Operations Unit is rated satisfactory. With two ministries and seven agencies involved with project implementation, the PMG and PMU worked effectively in coordinating their work. Regular meetings were organized to address project issues jointly and in a timely manner. The Operations Unit undertook its day-to-day management of project activities efficiently, ensuring that there were no significant delays or lags with procurement and disbursement. Weaknesses in the capacity of procurement staff were addressed through regular training provided by the Bank Country Office staff. However, in the area of M&E, there were delays with establishment of a sound baseline for some project interventions, such as water and soil quality monitoring. Detailed annual progress reports were made available to the Bank in a timely manner. The Micro-catchment Implementation Teams performed satisfactorily, working closely with the local beneficiaries advising them on the development of the MC plans and the menu of activities applicable to each MC's needs.

(c) Justification of Rating for Overall Borrower Performance
Rating: Satisfactory

76. Overall Borrower performance is rated satisfactory as throughout the life of the project, MEF and MARA staff, at the central and provincial level, worked together, diligently and effectively, to ensure project success. Activities were well coordinated and any issues that may have arisen during implementation were addressed promptly. It is worthy to note that despite the challenges of marrying activities related to forestry, rangeland, agricultural pollution control and rural employment within framework of watershed management, and the involvement of several implementing agencies, the Government made every effort to ensure that project implementation proceeded smoothly.

6. Lessons Learned

77. The major lessons drawn from the implementation of this operation can be summarized as follows:

78. ***Participatory design is key to promoting ownership.*** By actively involving target communities in the identification of problems and their solutions, and vesting them with the responsibility for implementing the agreed investments, the project fostered ownership on the part

of the local beneficiaries from the very start. It demonstrated that when communities are given the opportunity to be at the center of the decision-making process, they feel a greater sense of responsibility to make things work and succeed. This higher level of engagement and pro-activeness also contributed to improved knowledge and capacity which in turn promoted sustainability and replicability of project interventions. While detailed project preparation was largely undertaken by the agencies of the two implementing ministries they too recognized that a top-down, command-and-control approach would jeopardize community participation and consequently the achievement of project objectives and gave local beneficiaries a high degree of autonomy in the selection of investments during development and implementation of MC plans.

79. ***A flexible approach allows timely adaptations to changing needs and circumstances***. One reason that the project performed well was the built-in flexibility to allow for rapid adaptations to changing needs and circumstances. Since all risks could not be foreseen at the time of project preparation, it was considered important to build in a measure of flexibility to allow stakeholders adapt project interventions quickly and cost-effectively. Such flexibility prevented implementation delays, lags in disbursements, and sustained stakeholder support. This was well borne out by the project when the beneficiaries were able to introduce a completely new technology, namely, low-cost solar water heating system, in lieu of livestock support due to rising cattle prices. Also, project activities related to agriculture (crop production, orchards, etc.) are generally seasonal in nature and can be impacted by vagaries of nature. It is important that projects provide mechanisms to enable beneficiaries reorient activities quickly and efficiently to respond to unforeseen circumstances.

80. ***Establishing a direct link between natural resource rehabilitation and tangible economic and social benefits is critical for increased uptake of natural resource management activities.*** The project demonstrated that activities related to rehabilitation of degraded natural resources in rural areas have a higher uptake when tied to income generating activities. This is especially true in areas of high poverty where "protecting the environment" per se is not a priority. However, when beneficiaries benefit economically from engaging in environmental rehabilitation and conservation activities, there is heightened interest and support for natural resource protection.

81. ***Dissemination of information through public awareness programs is crucial for the widespread adoption of new practices and technologies.*** At the time of project preparation, there was, at best, a limited understanding of the benefits of animal waste management and natural resource rehabilitation in the target MCs. Through an aggressive public awareness program using multiple channels of communication, the project disseminated critical information on the causes and impacts of natural resource degradation and the associated economic, social and health benefits of adopting mitigation technologies/practices that were promoted under the project. It actively addressed a knowledge void that was critical in the achievement of project objectives. By informing and educating local stakeholders, the project generated much interest in, and support for, natural resource and nutrient management activities both within the project area and beyond. Thus, information dissemination is key to adoption and replication of technologies unfamiliar to target stakeholders.

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

(a) Borrower/implementing agencies

82. See Annex 7.

(b) Cofinanciers

83. Not Applicable

(c) Other partners and stakeholders

84. Not Applicable

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Anatolia Watershed Rehabilitation Project - P070950			
Components	**Appraisal Estimate (including physical and price contingencies) (USD millions)**	**Actual/Latest Estimate (including physical and price contingencies) (USD millions)**	**Percentage of Appraisal**
Rehabilitation of Degraded Natural Resources	23.50	14.01	59.60
Income Raising Activities	17.57	4.67	26.50
Strengthening Policy and Regulatory Capacity towards meeting EU Standards	0.28	0.0*	0
Awareness Raising, Capacity Building and Replication Strategy	1.06	0.30	28.30
Project Management and Support Services	2.50	0.57	22.00
Total Baseline Cost	**44.91**	**19.55**	**43.50**
Total Project Costs	**44.91**	**19.55**	
Front-end Fee	0.20	0.10	
Total Financing Required	**45.11**	**19.65**	
Anatolia Watershed Rehabilitation GEF Project (Black Sea) - P075094			
Components	**Appraisal Estimate (including physical and price contingencies) (USD millions)**	**Actual/Latest Estimate (including physical and price contingencies) (USD millions)**	**Percentage of Appraisal**
Rehabilitation of Degraded Natural Resources	6.13	8.32	136
Strengthening Policy and Regulatory Capacity towards meeting EU Standards	0.18	0.22	122
Awareness Raising, Capacity Building and Replication Strategy	0.38	0.13	34
Project Management and Support Services	0.31	0.44	141
Total Baseline Cost	**7.00**	**9.11**	
Total Project Costs	**7.00**	**9.11**	
PPF	0.00		
Front-end fee IBRD	0.00		
Total Financing Required	**7.00**	**9.11**	

(b) Financing

P070950 - Anatolia Watershed Rehabilitation Project				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Borrower		7.30	4.49	61
Local Communities		7.70	---	---
International Bank for Reconstruction and Development		20.0	15.15	76
Global Environment Facility				
P075094 - Anatolia Watershed Rehabilitation GEF Project (Black Sea)				
Source of Funds	**Type of Financing**	**Appraisal Estimate (USD millions)**	**Actual/Latest Estimate (USD millions)**	**Percentage of Appraisal**
Borrower		2.20	2.14	97
Local Communities		0.80	---	---
International Bank for Reconstruction and Development		---	---	---
Global Environment Facility (GEF)		7.00	6.98	99

*Although US$0.28 million was allocated for Component 2 under the IBRD loan, the project achieved the agreed outputs with only the GEF allocation. A re-allocation of resources under the GEF grant increased the allocation under this component by approximately US$0.40 million.

Note: Contribution of the Local Communities was in-kind. Monetary value of the in-kind contribution has not been computed by government.

Annex 2. Outputs by Component

1. Micro-Catchment (MC) Plans. All 28 MC plans were successfully developed and implemented. Several training sessions, such as "*World Bank Procurement Methods, Micro-catchment Selection Criteria, Monitoring and Evaluation System"* and "*World Bank Purchasing Methods and Principals and Micro-catchment Plan Techniques*" were provided to inform the communities in the project MCs about the process of MC planning and monitoring. The training programs were offered in all six provinces. A public awareness program was also successfully implemented to raise awareness among target beneficiaries and other stakeholders about the project approach and terms of participation in the MC development.

Component 1: Rehabilitation of Degraded Natural resources:

2. ***Increased Vegetative Cover:*** The project aimed at increasing vegetation cover in the project villages by 20% at the mid-term and 50% percent by year 7, over the baseline. The aim was to increase overall productivity of about 34,000 ha of degraded forestland, range land, and agricultural land. Through soil conservation afforestation, vegetation improvement, fallow reduction, rehabilitation participatory planting, gallery plantation, and in-forest rangeland rehabilitation works, about 58,000 ha of degraded lands were rehabilitated with increased vegetative cover. Vegetative cover thus increased by about 75% which exceeded the target set at appraisal.

3. ***Improved Soil Fertility***: The project aimed at increasing soil fertility on sloping lands as measured by the organic matter (humus) content in project MCs from the baseline by 10% by the midterm and by 20% at project closure. Increased productivity of three crops was used a proxy to measure improvements in soil fertility. The selected crops at baseline were sainfoin with yields of 275 kg/da, chickpea 90 with kg/da, and alfalfa with 1080 kg/da. The project set itself objectives to reach productivity enhancements for sainfoin (by 44%), chickpeas (by 27%), and alfalfa (by 25%). End of project results showed that an overall productivity increase of 182 % was achieved with sainfoin, 89% with chickpeas, and 18% with alfalfa, thereby exceeding targets set at appraisal.

Environmentally Friendly Agricultural Practices:

4. ***Reducing Nutrient Discharge in Water Bodies:*** The objective of this activity was to develop and test a package of investments and practices for reducing nutrient discharge into water bodies in the four Black Sea Provinces. Towards this, the project undertook a training and demonstration program to demonstrate environmentally-friendly practices, such as crop rotation, crop nutrient management, animal waste management, and use of organic matter. 65% of farmers in the project area were targeted for such training. Appropriate packages of practices were successfully tested in the pilot areas and 3500 persons were trained through 200 distinct training programs. At project closure Good Agricultural Practices (GAP) implementation in the four Black Sea provinces and 14 micro-watersheds was still ongoing. Some 90% of farmers were reported to have adopted nutrient management practices in the four Black Sea provinces.

5. ***Manure Handling*****:** Adoption of improved manure handling and storage facilities was a key objective for this activity. The target was to promote adoption of improved manure handling and storage facilities among 55% - 60% of farmers in areas where such practices would be piloted. In this connection, some 381 units of household and farm-level solid and liquid manure storage

facilities were established. Also ten units of central-level solid and liquid manure storage facilities were established. The project also provided necessary technical equipment including loaders, trailers, solid manure spreaders and mixers which was critical for efficient management of the manure to reduce nutrient loads to soil and surface and ground water bodies. A Nutrient Manual and Soil Analyses Manual were prepared with the assistance of the Soil Manure Research Institute. Software with regard to application of manure in project sites was also prepared and training provided to beneficiaries. In this connection the Institute worked with farmers to analyze their soil samples and advise them on optimal application of agricultural inputs.

Component 2: Income Generation

6. ***Increased Household (HH) Incomes***: The project aimed at increasing household incomes in participating MC communities starting from a modest baseline of average HH income estimated at TL 4,200, where the underlying figures were derived from surveys conducted in project MCs before project implementation started. A target was set to increase HH incomes in the participating MC communities by 10% above baseline at midterm and by 40% at project closure. These targets were far exceeded. It was estimated that the average HH income was raised by 53% as revealed by the beneficiary surveys completed in project MCs.

7. ***Farm Income Diversification***: The project aimed at providing training and materials to qualifying farmers to help them engage in activities to raise and/or diversify farm income. The baseline was 2674 for the total number of farmers in the MCs of Sivas, Çorum, Kayseri and Amasya provinces. The target was to reach at least 60 % of farmers in the designated MCs to equip them with training in new agriculture based income regeneration /diversification activities. Toward this, some 83% of the farmers were trained by the end of 2010, and the achievement rate is expected to reach some 142% by the end of 2012.

Component 3: Strengthening Policy and Regulatory Capacity towards meeting EU Standards

8. ***Nitrates Directive Legislation:*** The project aimed at development and promotion of legal framework consistent with the EU Nitrates Directive. The Directive aims to protect water quality by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices. Prior to the project, there was no such legal framework in place. Regulation numbered 25377 was published in the Official Gazette on February 18, 2004 which seeks to protect waters against pollution from agricultural sources. While the legislation has been enacted, the Government is currently actively searching for ways and means of enforcing this regulation effectively and developing more detailed instruments that would facilitate its implementation. The Directive is a critical component of the EU Water Framework Directive and the project has helped the country initiate compliance with the different requirements of the Water Framework Directive.

9. ***Development and Promotion of a Code for Good Agricultural Practices (GAP)***: The project developed the Code of Good Agricultural Practices as required under the EU Nitrates Directive. At project start, virtually no farmers were known to be using environmentally- friendly agricultural practices. Environmentally-friendly agricultural practices have now been adopted by 30% of farmers in project micro catchments in Black Sea Provinces. Activities on GAP are ongoing in the four Black Sea provinces, in 14 microcatchments.

10. ***Institutional Support for Organic Farming:*** TA and training in support of organic farming and marketing of organic products was provided as planned. No formal local training

was available for organic farming prior to the project. Some 54 farmers participated in the training sessions on Organic Farming and Principles, 37 farmers in Why Organic Farming and 75 farmers in Threats Awaiting the World and Organic Farming for a total of 166.

11. ***Water Quality Monitoring***: One of the objectives of the project was to develop and implement a water quality monitoring program. Prior to the project, no water quality monitoring program was in existence. Under the project, various institutional and regulatory mechanisms were put in place supporting water quality monitoring program, which has been mainstreamed into Ministry operations such that monitoring could be carried on a continuous basis. Some 140 stations of 14 MCs (57 pieces of groundwater and 83 pieces of surface water) have been established and water quality monitoring program have now been fully integrated in the Ministry's routine duties.

12. The project provided necessary training and equipment to strengthen capacity of laboratories for soil and water quality monitoring. A detailed laboratory handbook was developed to harmonize analysis procedures by all laboratories. The laboratory in Samsun is EU accredited and the National Reference Laboratory in MEF in Ankara is well equipped with mobile laboratory for water quality analysis. Water is analyzed for pH temperature, dissolved oxygen, turbidity, suspended solids, nitrates, TN, TP and fecal coliform. Sampling period is monthly for surface waters and quarterly for ground waters.

Component 4: Public Awareness, Capacity Building and Replication Strategy

13. ***Public Awareness Campaigns:*** The project aimed at developing and implementing public awareness campaigns (PAC) for MC development, increasing awareness of causes, effects and mitigating measures of natural resource degradation, animal waste management and nutrient reduction to soil and water bodies. Awareness raising activities were undertaken in all project MCs. For nutrient management specifically, more than 27,000 persons in 14 watersheds were contacted belonging to some 4600 households. A website for the project was established. Brochures and posters were prepared in five different designs to reach as wide an audience as possible. The Government commissioned a 30 minute documentary, as well as several short television spots to disseminate information on the project and its potential benefits.

14. ***Training and Seminars:*** A detailed training program was designed to increase knowledge and skills of both central and provincial staff working on the project as well as target communities on several areas related to nutrient management. These included international study tours to several countries such as Germany, Poland, Romania, Moldova, and Georgia. Turkey hosted the "Integrated Nutrient Pollution Management Workshop", one in a series of workshops organized by countries receiving GEF support under the Danube-Black Sea Strategic Partnership Program that aimed to reduce nutrient loads to the Black Sea. About 40 international and 50 national experts participated in the workshop. The workshop provided an excellent forum of the exchange of ideas and experiences with agricultural pollution control, and nutrient management practices in particular, that served to enhance the knowledge and skills of participating project team members. It also hosted the workshop on: *Integrated Participatory Watershed Rehab Techniques in Degraded Lands*, where participants included representatives from a wide range of countries including, Azerbaijan, Ukraine, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan, Moldova, Georgia, and Uzbekistan. The workshop was well received and consequently offered twice where participating countries included Bosnia-Herzegovina, Ethiopia, Palestine, Kosovo, Macedonia, Senegal, and Sudan.

15. ***Replication Strategy for Nutrient Discharge***: A comprehensive replication strategy was put in place and targets were set for future nutrient reduction on the basis of achievements of activities in pilot MCs. An international consultant was hired to evaluate the results of activities in ten selected watersheds and a report was prepared to establish an applicable strategy to apply these activities across the whole country.

Annex 3. Economic and Financial Analysis

A. INTRODUCTION

1. **Background:** The overall development objective of the Turkey Anatolia Watershed Rehabilitation Project was to support sustainable natural resource management practices in 28 micro-catchments in Anatolia and Turkey's Black Sea Region and thereby raise incomes of communities affected by resource degradation. The project aimed to build and expand on a community-based approach to natural resource management. The Project design was based largely upon the experience and insights acquired under the Eastern Anatolia Watershed Rehabilitation Project. The project closing date was June 30, 2012.

2. Project components are: Component 1: Rehabilitation of degraded natural resources whose primary objective is to protect degraded areas from further degradation, erosion and pollution. Component 2 supports Income generating activities designed to provide participating communities with the incentives to undertake conservation efforts. Component 3 strengthens policy and regulatory capacity towards meeting EU Standards including support for the application of the EU Nitrates Directive, development and promotion of a code of good agricultural practices, and institutional support for organic farming. Component 4 supports awareness raising in micro-catchment development, capacity building and replication strategy. Component 5 supports project management and support services, including a fund for applied research and technology dissemination.

3. **Project Service Area**: There are 25 river basins in Turkey. The three river basins initially planned to receive project assistance consist of the basins of Yesilirmak, Kizilirmak and Seyhan. These three basins are adjoining and form some contiguous territory slicing Turkey in half from North to South. They cross the Anatolian peninsula from the Black Sea in the North to the Mediterranean in the South (please see the attached map). The two basins where the project intervened – Yesilirmak and Kizilirmak – collectively have 12.28 km^3 of average annual flow corresponding to some 6.6% of Turkey's annual flow in its rivers. The total flow for the entire country is 186.05 km^3, which represents that portion of the precipitation that has economic value and that can be used for water supply, irrigation, industry etc. However, these two rivers are significant because population density around them is much higher than on other rivers (Euphrates and Tigris for instance) which have higher flow but fewer people living on or around them.

Turkey's River Basins and the Project Intervention Zone

Name of River Basin and Where The Basin Drains	Catchment Area		Average Annual Flow		Average Annual Yield
	(km^2)	%	(km^3)	(%)	($l/s/km^2$)
Yeşilırmak Basin (Black Sea)	36,114	4.6	5.80	3.1	5.1
Kızılırmak Basin (Black Sea)	78,180	10.0	6.48	3.5	2.6
Seyhan Basin (Mediterranean)	20,450	2.6	8.01	4.3	12.3
TOTAL for Turkey	**779,452**	**100.0**	**186.05**	**100.0**	

Source: Ministry of Forestry and Water, ICT Department (2012)

4. The project covers six provinces: Kayseri, Amasya, Tokat, Corum, Samsun and Sivas. Three provinces (Corum, Samsun, Sivas) are located in both basins (table). There are many downstream provinces (list below) that are in the same river basins but not covered in the project.

This is because the project targets only those catchment areas located in the upper-stream segments of the rivers where the rivers originate.

Geographical Areas in Project Impact Zone

Included or Excluded in Project	Kizilirmak Basin	Yesilirmak Basin	Both Basins
Included in Project	Kayseri,	Amasya, Tokat,	Corum, Samsun, Sivas
Not included in Project	Sinop, Kastamonu, Cankiri, Kirikkale, Kirsehir, Nevsehir, Yozgat	Yozgat, Erzincan, Giresun, Gumushane	

5. **AWRP as a Replicable Model:** AWRP has served as a replicable model for implementation in other watersheds in Turkey, and has helped mobilize significant funding in watershed management involving intensive targeting of selected micro-catchments. One can discern little difference in approach between the AWRP and Coruh WRP, for instance, highlighting the fact that AWRP has furnished a genuine replicable format and model. The same applies to the case of the IFAD-funded operation in pipeline: Murat River Watershed Rehabilitation Project. The TA and training efforts funded under the project have led to significant capacity creation within the implementing agencies, and have increased the self-confidence of the participating staff, allowing them to assume responsibility for further watershed projects in Turkey.

6. **AWRP in the World**: In addition to its role as a replicable model in Turkey, AWRP also compares favorably with other projects in the World. The final draft of the Turkey National Basin Management Strategy document lists AWRP as a good practice case that (a) combines conservation, intensified resource use and livelihood objectives, and (b) uses participatory approaches along with some other comparable initiatives in the world.

Watershed Management: Good Practice Cases	
Combine conservation, intensified resource use and livelihood objectives	• Loess Plateau: China • Lakhdar Rural Development: Morocco • Northwest Mountains: Tunisia • Anatolia Watershed Rehabilitation: Turkey • Karnataka Watershed Management: India
Use participatory approaches	• Karnataka Watershed Management: India • Northwest Mountains: Tunisia • Anatolia Watershed Rehabilitation: Turkey

Source: Turkey National Basin Management Strategy, World Bank, Sector Note, Final Draft, November 2010

B. SUMMARY OF CBA FROM THE PAD

7. According to the original design, economic benefits of the project fall into two main categories: (i) benefits from a restored natural resource base and, (ii) increased household income from intensification and diversification of farming systems. The quantification of economic benefits from an improved natural resource base in the 28 project MCs includes a valuation of three distinct benefits: (i) savings in erosion induced soil loss; (ii) yield increases due to improved agricultural land and (iii) reduced flood control costs. Other benefits, such as reduced siltation in dams, improved quality of drinking water due to reduced sedimentation content of the water; increased soil moisture content and reduced carbon sequestration were not quantified due to lack of data. The quantification of incremental benefits from improved farming techniques and diversification was based on farm budgets for various project supported activities in the 28 MCs, taking into consideration conjectural phasing of project activities.

8. The bulk of the project costs were allocated to Component 1 (mainly degraded resource rehabilitation), while Component 2 (mainly income generation activities), were assumed to generate the majority of the requisite benefits to derive the CBA. Components 3 and 4 (mainly institutional support) were not taken into account in the CBA. Benefits of capacity building are difficult to ascertain since it is an individual's behavior after training that determines benefits - and this is difficult to measure a priori. Hence, given its limited scope and depth, the economic analysis found in the PAD can be characterized as partial, and mostly indicative.

9. The ERR (18.6%) and the NPV (US$ 15.3 M) were calculated over a period of 25 years. NPV estimates assumed an opportunity cost of capital (OCC) of 12 %. Sensitivity analysis suggested that a 20 % increase in project costs combined with a 20 % reduction in project benefits would still yield an ERR in excess of 14 % and an NPV of US$ 5.7 million (please see table below). If the impact of project activities on erosion were not to materialize the ERR would drop to 18.1 % and the NPV to US$ 13.7 million, highlighting the limited weight assigned to the core issue of erosion control. Excluding the irrigation component, by contrast, would effectively reduce the ERR to 12.3 % and the NPV to near zero, emphasizing the critical impact this investment was purported to exert on the project's performance in the ERR model that was used.

10. The cost of the project activities in the baseline scenario was estimated at US$ 37.92 million (exclusive of price and physical contingencies). It was clearly acknowledged that available resources under the project were modest and would prove insufficient for ambitious objectives such as developing environmentally friendly farming practices in the lower part of the

key watersheds that discharge into the Black Sea and supporting comprehensive adaptive research aimed at reducing agricultural pollution while maintaining or increasing yields.

Base Case and Sensitivity Analysis from the PAD

Project Scenario	ERR	NPV (US$ million)
Base Case	18.6%	15.3
Costs increased by 20%	16.7%	12.0
Benefits decreased by 20%	16.3%	7.6
Cost +20% and Benefits - 20%	14.4%	5.7
Benefits delayed by 2 years	18.3%	13.7
Erosion Control Benefits not Materializing	18.1%	13.7
No Irrigation Sub-Component	12.3%	0.4

Source: AWRP PAD Annex 4 - January 2003

C. DATA AND METHODOLOGY

11. **Approach and Data:** This analysis is intended to meet the requirements of the ICR section on Economic and Financial Analysis in compliance with the World Bank ICRR Guidelines following a review the material found in the PAD, project Aide Memoires, Implementation Status Reports and various Progress Reports issued by the implementing agencies.

12. **Methodology:** An economic analysis is being performed in this annex due to the fact that project benefits are mostly of public nature, as opposed to a financial analysis which would be pertinent mostly for revenue generating activities. The approach pursued is driven largely by the quantity and quality of the available data. The analysis aims to extend and update the existing analyses reflected in the PAD while recognizing that the initial CBA was partial. The analysis presented herein adheres as much as possible to the approach and format outlined in the ICR guidelines, supported by benchmark analysis of similar projects in the region, as well as making reference to the predecessor project Turkey Eastern Anatolia Watershed Rehabilitation Project and other efforts whose designs were patterned after AWRP.

13. **Project's ERR and NPV:** An NPV and ERR were calculated for the project during its design. Re-estimation of the same would require a review of the underlying project costs and benefits. The section below sheds light on this aspect.

14. **Project Costs**: Beginning with the **cost side** of the equation, the project disbursed approximately US$ 19.55 million to implement the IBRD funded portion where the Bank contributed approximately US$ 15.15 million (total financing under the loan is US$19.65 which includes the US$0.1 million front-end fee). The remaining funds (US$ 4.49 million) came from the Government. Therefore, actual project funding from IBRD, GEF and Government was about US$ 28.65 million: US$ 19.55 for IBRD-supported activities and US$ 9.11 million for GEF-supported activities, which included the GEF Grant of US$7.0 million and US$2.14 million Government contribution. There were additional in-kind contributions from the direct beneficiaries which have not been monetized by the Government. The initial appraisal estimate for the five project components was US$ 44.91 million including user contributions. Of the IBRD funded portion, Component 1 - which is the focus of the analysis below - accounted for the highest level of investment spending as well as the rate of disbursement. It disbursed US$ 14.01 million corresponding to 71% of the IBRD-funded portion of the project. Re-estimation of ERR and NPV for Component 1 will therefore consider the actual cost of US$ 14.01 million. This is a

conservative approach. Including all contributions from all local communities (including in-kind) would impact the final rates of return.

Project Costs by Components for the IBRD Funding Only (US$ Million)

Components	**Appraisal Estimate**	**Latest Estimate (Excluding User Contributions)**
Component 1: Rehabilitation of Degraded Natural resources	23.50	14.01
Component 2: Income Raising Activities	17.57	4.67
Component 3: Strengthening Policy and Regulatory Capacity Towards Meeting EU Standards	0.28	0.00
Component 4: Awareness Raising, capacity Building and Replication Strategy	1.06	0.30
Component 5: Project Management and Support Services	2.50	0.57
Totals	**44.91**	**19.55**

15. **Project Benefits**: Quantifiable project benefits in the PAD consisted of (i) savings in erosion induced soil loss; (ii) yield increases due to improved agricultural land and (iii) reduced flood control costs. All three benefits fall under the general heading of erosion control.

16. **Benefits Related to Soil Loss**: The project aimed at saving an estimated 1.5 million tons of soil annually which would otherwise be eroded without the project. To quantify the value of this reduction, soil losses in tons were translated into soil losses in areas. A loss of 1.5 million tons of sediments corresponded to an annual loss of about US$ 31,000. The productivity losses would cumulate over time and reach US$ 310,000 per year after 10 years. Under the project, erosion would progressively be reduced by 80 percent and it is estimated that in PY 20, annual savings would reach TL 400,000, or US$ 300,000 per year.

17. **Benefits Related to Crop Yields:** Erosion negatively affects crop yields. Due to lack of data, in the PAD the analyst assumed that productivity would decrease by 1 percent every year without the project as a result of continuing erosion. These losses would progressively be reduced and yields would stabilize after 5 years as a result of erosion control activities by the project. This conservative assumption would lead to an annual savings of about TL 380,000 (USS 280,000) after 10 years.

18. **Flood Control.** Serious damages are inflicted by floods in the three major watersheds partly served by the project. Reduced erosion has an impact on the frequency and severity of floods by sharply controlling the peaks of water flow both through increased infiltration and slowing down the flow where vegetation cover is restored. Calculations showed that annual savings associated with effective flood control in the micro-catchments would amount to about US$ 30,000.

19. With a renewed focus on Component 1, a plan was made to revisit these three benefit streams. However, data proved constraining and it was difficult to assemble the diverse set of existing data into a coherent picture. The most plausible remedy therefore involved utilizing proxies and benchmarks for revising the AWRP efficiency measures (NPV and ERR), in conjunction with updates of the original data.

20. **Project Benefits Not Considered**: The principal project benefits which were included in the original analysis but excluded in the re-estimation of the ERR due to lack of data consisted of (a) fallow reduction, (b) small scale irrigation, and (c) animal husbandry activities. Fallow

reduction was assumed to result in increased fodder production which would lead incremental annual benefits of TL 334,000 as of year seven. Small scale irrigation was expected to provide for the development of about 4000 ha of new irrigated land which would allow conversion from the current extensive production of cereals to a more intensive cultivation of higher value crops. The animal husbandry activity was planned to involve improved practices with the production of sheep, goats, dairy and fodder crops under the implementation responsibility of ORKÖY which operates in villages in and around forested areas.

D. ANALYSIS

21. **Plausible Ranges of ERR**: Looking at the design experience of the other watershed projects in Turkey, one can note that the estimated ERR of such projects varies between 8% and 18%. This would suggest a reasonable range of acceptable projects for our purposes.

Comparison of Three Watershed Rehabilitation Projects in Turkey

Project	ERR	NPV in M US$	Official Project Cost M US$	Horizon
Anatolia WRP (completed)	18.1%	23.30	45.11	25 years
Coruh WRP (recently launched)	16.1%	8.88	60.56	25 years
Murat River WRP (in pipeline)	8.0%	N/A	43.11	20 years

22. However, given the fact that not all of the anticipated agricultural benefits (with implication of short term tangible benefits) of the project could materialize, we would expect AWRP ERR and NPV to be somewhat less than what was envisioned, because there has been an accompanying reduction in the economic benefits.

23. It should be noted that the absolute level of the NPV itself has little relevance. All we need to ensure is that it should be positive. Choice of a lower OCC would naturally help lift the NPVs while leaving ERRs unaffected. So, one does not need to worry about the NPV any more than making sure that it has the right sign. It is discerned that the above analyses have all used OCCs in the range of 12%. Given the global recession, one can justify a lower OCC of 6%, for instance, and be able to make a good case for the AWRP. This is the approach being taken in this Annex.

24. With respect to the ERR, as pointed out above, there is reason to believe that it would be lower than 18%. However, even under these circumstances, the project would still be deemed acceptable in economic terms until the ERR has been lowered to a level such as 10 to 12%.

25. **Re-Estimation Procedure**: As already indicated, this analysis focuses solely on Component 1 costs and benefits. In consequence, below we present a re-estimation of the ERR and NPV for Component 1 alone, with a view to exploring the implications of this exercise. As mentioned above, Component 1 constitutes the core of the project in terms of environmental interventions where there is greater scope of offering a simpler indicative and partial analysis.

26. The cost side for Component 1 was US$ 14.01 million, which remains unaffected. As for revised benefits, a review of the Coruh WRP (the benchmark case) showed that avoided repair costs (flood risk mitigation), avoided soil loss and improved range management constituted the bulk of this project's benefits (please see table attached). Since there was a scarcity of new and

reliable economic data from the AWRP, we resorted to economic data of the Coruh WRP, and attempted adjustments on the **flood control benefits**. Meanwhile, remaining data regarding soil loss and crop yields were revised by updating the project's own figures using external escalation factors.

27. The principal motive behind the re-adjustment of AWRP's flood control benefits was that the design has grossly underestimated them. Restoring the level of these benefits back to normal would naturally render the analysis more realistic.

28. Comparison of the annual incremental flood control benefits for AWRP (US$ 30,000) and Coruh WRP reveals that the latter's was in the order of US$ 950,000 (TL 1.7 million) for a project 6 times smaller in overall catchment area, 2 times smaller in water carrying capacity (discharge rate), two times smaller in population and 35% smaller in terms of the number of micro-catchments served. If a very rough adjustment factor were to be proposed, AWRP's flood control benefits would perhaps be 30 times larger. But, the actual service area of Curuh AWRP is twice as large and the number of villages it contains is 25% greater. So, a downward adjustment is in order too, which would lead to an approximate overall adjustment factor of 12. Thus, based on this crude logic, the AWRP flood control benefits are expected to be in the order of TL 20 million annually, or some US$11 million annually.

29. Despite the large magnitude of US$ 11 million in flood control benefits just computed, we remained on the very conservative side and tried to test the annual flood control benefits for US$ 3 million, US$ 4 million and US$ 5.5 million and explored the implications in conjunction the ERR, NPV and sensitivity analysis as shown below.

30. With regard to adjustments on the benefits related to soil loss and crop yields, external escalation factors were used. The original CBA was performed in TL terms. Since project preparation in January 2003, Turkey has experienced significant inflation while curiously the TL kept appreciating against the US$. Looking at the TL side alone, the TL of 2012 is only 42%[4] as valuable as the TL in 2003. This means that an escalation coefficient of 2.4 should be used to update the historical figures into current TL, and then convert them into US$ for a US$ based analysis. As a result of this procedure, the re-estimated benefits were about 33% larger than original levels. No adjustment was made in the actual project costs of US$ 14.01 million other than phasing them over the years. The below tables contain information on how benefits were re-adjusted and ERR and NPV re-estimated.

Component 1 - Major AWRP Benefits and Readjustments

Project Benefit	**PAD Estimate**	**Escalated Data in TL (escalation factor of 2.4)**	**Escalated Data in US$**
Erosion Control: Avoided Soil Loss and Improved Range Management	TL 400,000 annually after 10 years, and keep increasing if unabated	TL 960,000 annually	US$ 530,000
Avoided Losses On	To stabilize at TL	TL 912,000 annually	US$ 500,000

[4] One must multiply the TL values of January 2003 with 2.3979 to arrive at their current values in November 2012. The information comes from Capital Infocard, which is based on spliced official price indices (CPI) in Turkey from 1983 to 2012.

Crop Yields	380,000 annually after 10 years		
Flood Control	To reach US$ 30,000 per year after 10 years	No escalation was performed here, since the base estimate was judged too low. A proxy was adopted.	Re-Estimated at US$ 3 million annually after 10 years based on Coruh WRP analysis

Re-Estimated ERR for Component 1 - Base Case

Years	Project Costs	Principal Comp. 1 Benefits			Cash Flow
		Avoided Soil Loss	Avoided Losses on Crop Yields	Flood Control Benefits	
1	2,337,449	50,000			(2,287,449)
2	4,129,159	100,000			(4,029,159)
3	4,492,653	150,000			(4,342,653)
4	2,045,882	200,000			(1,845,882)
5	429,000	250,000	250,000		71,000
6	582,000	300,000	300,000	300,000	318,000
7		350,000	350,000	600,000	1,300,000
8		400,000	400,000	900,000	1,700,000
9		450,000	450,000	1,200,000	2,100,000
10		500,000	500,000	1,500,000	2,500,000
11		530,000	420,000	1,800,000	2,750,000
15		730,000	420,000	3,000,000	4,150,000
20		980,000	420,000	3,000,000	4,400,000
25		1,230,000	420,000	3,000,000	4,650,000
TOTALS	14,016,143	15,950,000	8,550,000	46,500,000	56,983,857

IRR	Percent	14%
NPV (@6%)	In Million US$	15.53
C/B Ratio	Dimensionless	4.35

31. **Sensitivity Analysis**: A sensitivity analysis was preformed around the most critical parameter involving the flood control benefits by parametrically varying it from US$ 3 million up to US$ 5.5 million. The results are presented below.

Parameter	Base Case - Flood Control Benefits at US$ 3 M annually	Flood Control Benefits at US$ 4 M annually	Flood Control Benefits at US$ 5.5 M annually
IRR	14%	16%	18%
NPV - million US$	15.53	21.36	30.11
C/B Ratio	4.35	5.27	6.65

32. **Conclusions**: The project initially planned to work in three watersheds, but ended up working in two. Meanwhile the scope of the activity was not scaled down since the project completed rehabilitation works in 28 micro catchments, as originally planned. The partial and indicative analysis for the base case shown above leads to the conclusion that the re-computed ERR would be around 14%, with NPV being equal to US$ 15.53 M and B/C ratio of 4.35 under the assumption of an OCC of 6 %. Sensitivity around flood benefits revealed that US$ 5.5 million in flood control benefits would replicate the original ERR of 18%. It is believed that if a full analysis were to be attempted, the recomputed overall efficiency parameters for AWRP would be larger, since important legal reforms were made as a result of GEF interventions, as well as significant capacity building not included in the above analysis.

Comparison of Coruh WRP with Anatolia WRP

Description	**Units**	**Anatolia WRP**	**Coruh WRP**
THE BASIN			
River Basins	List	Yesilirmak & Kizilirmak	Coruh
Total Catchment Area in the Basin	km^2	114,294	19,872
Mean Annual Discharge (Flow)	km^3	12.28	6.3
Provinces	List	Kayseri, Corum, Samsun, Sivas, Amasya, Tokat	Artvin, Bayburt, Erzurum
THE PROJECT			
Project Duration	Years	7	7
Project Cost		M US$ 40	M TL 109
Number of Micro-Catchments	MC	28	18
Service Area (*)	Ha	327,600	604,300
Number of Villages in Project Impact Zone	Village	200	242
Population in Project Impact Zone	Person	98,000	55,000

(*) Based on an estimated 117 km2 per MC in the Kizilirmak and Yesilirmak Basins

Undiscounted Benefit Streams from Coruh WRP

	Economic Benefits in Million TL		
Source of Benefit	**With Project**	**Without Project**	**Increments**
Benefits from Resource Conservation and Rehabilitation			
Avoided Soil Loss	3.60	2.05	1.54
Avoided Repair Costs (Flood Control Benefits)	61.23	18.37	42.86
Improved Range Management	77.76	51.76	26.00
Carbon sequestration	6.88	4.63	2.25
Wood Savings	4.42	0.00	4.42
Employment	0.50	0.18	0.33
TOTALS	**154.39**	**76.99**	**77.40**

Source: Coruh WRP – Economic Analysis – December 2008

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Responsibility/ Specialty
Bank Staff		
S. Nedret Durutan	Team Leader, Agriculturist	Agriculture
Peter Dewees	Team Leader, Lead Forestry Specialist	Forestry
Joop Stoutjesdijk	Senior Irrigation Engineer	Irrigation
Rasit Pertev	Senior Agricultural Economist	Agriculture
Jitendra Srivastava	Senior Agriculturist	Agriculture/Environment
Cuneyt Okan	Operations Specialist	Agriculture/Environment
Elmas Arisoy	Procurement Specialist	Procurement
Salih Kalyoncu	Procurement Specialist	Procurement
Seda Aroymak	Financial Management Specialist	Financial Management
Julian Lampietti	Social Assessment Specialist	Social
Shahridan Faeiz	Social Assessment Specialist	Social
Tijen Arin	Environmental Economist	Environment
Dilek Barlas	Lawyer	Legal
Rohit R. Mehta	Senior Finance Officer	Finance
Ulker Karamullaogu	Program Assistant	Operations
Consultants		
John Cole	Agriculturist	Agriculture/Environment
Meeta Sehgal	Rural Development	Agriculture/Environment
Benoist Veillerette	Economist	Economics
Raffaele Suppa	Economist	Economics

Supervision/ICR

Names	Title	Unit	Responsibility/ Specialty
Ayse Seda Aroymak	Sr Financial Management Specialist	ECSO3	Financial Management
Halil Agah	Senior Rural Development Specialist	ECSS1	Rural Development
Jitendra P. Srivastava	Consultant	SASDA	Agriculture/Environment
Joop Stoutjesdijk	Lead Irrigation Engineer	SASDA	Irrigation
Nathalie Weier Johnson	Senior Environmental Specialist	ECSS3	Environment
Salih Kemal Kalyoncu	Senior Procurement Specialist	ECSO2	Procurement
Sohaila Wali	Temporary	ECSS3	Project Assistance
Tijen Arin	Senior Environmental Economist	EASER	Environment
Ulker Karamullaoglu	Program Assistant	ECCU6	Project Assistance
Zeynep Lalik	Sr Financial Management Specialist	ECSO3	Financial Management
Meeta Sehgal	Operations Officer	ECSS1	Agriculture-Rural Development
Suha Satana	Consultant	ECSS1	Economics

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY2002	25.88	93,150.22
FY2003	32.53	133,614.19
FY2004	23.50	103,477.33
FY2005	0.40	621.27
Total:	82.31	330,863.01
Supervision/ICR		
FY2005	1.16	3,912.85
FY2006	19.09	89,325.65
FY2007	17.31	74,676.39
FY2008	14.08	69,074.10
FY2009	16.97	85,225.35
FY2010	14.89	66,114.64
FY2011	19.78	138,890.03
FY2012	19.38	91,908.65
	13.58	84,593.49
Total:	136.24	703,721.15

Annex 5. Beneficiary Survey Results

Not applicable

Annex 6. Stakeholder Workshop Report and Results *(if any)*

Not Applicable

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

Below are the comments provided by the Government on the draft ICR and the Bank team's response.

(1) **Data Sheet**
It is stated that the amount for the IBRD Loan is 20 million USD. However, after the Village Affairs closed the amount of 4.2 million USD foreseen for the works to be executed by the Village Affairs was cancelled and the total amount was added to the Governments budged and was given to the Special Provincial Agencies as Participatory Contribution. In this regard, the Loan amount should be calculated in regard with the Mid Term Evaluation and should be stated as 15.7 million USD. This matter is already mentioned in Section 1.9 in the ICR report.

The table in the Data Sheet has been revised to reflect the cancelation of US$4.30 million and the revised loan amount of US$15.70 million. The US$4.30 million comprises US$4.20 towards cancelation of the small-scale irrigation works under Component 2 and US$0.10 million towards the 50% waiver of the front-end fee.

(2) **Project Indicators**
Some of the Project Indicators are such that they can be affected by external factors other than project activities. For instance, "soil fertility" "income level" type of indicators can be affected by various factors. For example, income level may rise due to the general economic progress going on in the country. Thus project performance may be overrated because of these factors. Project team should make sure that they exclude the impact of external variables from the change in a specific indicator to the extent possible.

We concur with this statement. We acknowledge that several factors have contributed to improvements in soil fertility and income levels in the project area during the life of the project and project interventions were just one of several factors contributing to such improvements. We also recognize that remarkable economic progress was ongoing in the country during the years of project implementation which impacted the achievement of project outcomes. However, a more exact and detailed calculation of each factor contributing to these achievements is complex and beyond the scope this ICR analysis. The fact that the achievement of select outputs/outcomes under the project cannot be solely and specifically attributed to project activities has been referenced in the Data Sheet where the achievement of project indicators is discussed.

(3) **Section 5.1 (a) Assessment of Bank Performance**
Project baseline data is gathered at the project planning phase and will be used as monitoring bases. Regarding; (The one shortcoming was the lack of some baseline data/values which compromised more in-depth assessment or measurement of some project outcomes.) Which data is a shortcoming is not understood properly. The statement regarding this matter should be revised.

The misstatement has been deleted. Indeed, baselines were to be established at the time of MC plan development during project implementation as indicated in the Monitoring and Evaluation section of the PAD (Section C4: Project Description Summary).

(4) **Annex 3: Financial and Economic Analysis**
(a) *The Project cost is 15.7 million USD in regard with the cancellation of the amount of 4.2 million USD in the Mid-Term evaluation result mentioned in the Section 1.9. The total disbursement of the Project is 19.65 million USD. The amount of 15.15 million USD is external*

budget and the amount of 4.49 million USD is the national Budget. The total disbursement of Loan and GEF is 28.76 million USD (19.65 million USD is spent in Loan including national budget- 9.11 million USD is spent in GEF). Again, regarding these disbursements the user contributions are not included. When the Project budget is evaluated in this regard, excluding the user contribution and including the national budget a realization of 93% is achieved in the Loan. In the beginning regarding the GEF part, while the spared budget including the government contribution and excluding the participatory contribution was 9.2 million USD, the disbursement was realized as approximately 9.11 million USD. The disbursement ratio is realized as 99%. The statement regarding representing more than 50% in costs savings is not correct. The disbursements regarding the main activities should be evaluated in regard with matters mentioned above. Because only the Loan and Government contribution can be shown in the tables the participatory contribution is not stated. It would be more appropriate if the evaluation was made in regard with these matters.

The project cost and disbursement figures have been revised in the Annex to reflect the accurate cost and disbursement figures and related statements have been amended / deleted.

(b) *It is known that the AWRP that covered the period of 2004-2012, was revised during the Project implementation after the abolishment of the General Directorate of Rural Services. Due to institutional restructuring, project cost declined from 52.11 USD millions to 27 USD millions. Therefore it is seen that project costs by components was changed and there is quite a difference between appraisal estimate and actual/latest estimate. However, in the Result Report, the initial project development objectives and original financing, approved by the related authorities were kept in order to assess the achievements of target values. For a better analysis of the project after completion, it is critical to use actual estimation.*

We confirm that the cost-benefit analysis of project achievements was undertaken using the actual/latest estimates of Project costs and not the estimates established at appraisal. These Actual/Latest figures are indicated on page 29, paragraph 14 of Annex 3: Financial and Economic Analysis.

(c) *In Annex 3, Economic and Financial Analysis part (pg 28-29), economic rate of return and net present value were calculated as 18.6% and 5.3 USD millions. However, if the revision of the Project were to be proposed, economic rate of return would perhaps change and net present value would be lower than now.*

We note and agree with the statement that if project costs/disbursements are modified, this would be impact the economic rates of return and net present value. However, the analysis has been undertaken on the actual/latest project cost estimates for Component 1: Rehabilitation of Degraded Lands, the rationale for which is explained below in comment (e). Additionally, we wish to clarify that the original economic analysis presented in the PAD underestimated the environmental benefits, which we have recomputed to a more realistic level in the latest analysis contained in the ICR

(d) *The given sensitivity and economic analysis has a limited scope. Instead of making a new calculation, the same tables of these analyses in page 29, 30, 31 were taken from the initial approved AWRP Report. Due to inadequate representation in Annex 3, re-estimation and a detailed explanation of these calculations are needed. Economic calculation methods may be given as an Annex.*

Only the table on page 29 has been borrowed from the PAD with full referencing to the source. Other tables that appear on pages 30 and 31 have been developed by the ICR team, and embody new ideas and analysis.

We acknowledge the need for additional documentation to justify the analyses. The team will compile and share, with the Government, the complete sets of data used for the calculations undertaken in this Annex as well as the original Excel sheets and accompanying narrative. However, we suggest not including them as an annex to this document as they are substantially detailed and voluminous.

(e) *In page 31, it is stated that cost-benefit analysis was solely made for Component 1: rehabilitation of degraded natural resources due to the fact that it constitutes the core of the project in terms of environmental interventions. Besides, a re-estimation of financial and sensitivity analysis for Component 1 is presented in page 33. It is important that estimations should be comparable before and after the implementation of the project and should be compatible with the other components' output indicators.*

The rationale for focusing on Component 1 was that most economic benefits under the project accrued through implementation of this component. Component 2 (Income Generating Activities) was substantially reduced during project implementation with the cancelation of the small-scale irrigation activity which would have been critical for enhancing economic benefits under the project. In fact, the final project cost of this component was only 26.5% of the appraisal estimate. The actual stream of benefits had to therefore adjusted and reduced significantly during implementation vis-à-vis appraisal. Moreover, availability of limited data precluded an in-depth analysis of economic returns under Component 2.

(f) *In page 31 and 34, Anatolia WRP, Coruh and Murat River WRP were compared in terms of official project cost, economic rates of return, net present value, number of micro-catchments, population, etc. It is not seemed to be rational to compare projects where some of them are totally completed, that others are ongoing or not started yet.*

The team clarifies that the comparison among the above projects was done in terms of their design. This is due to the fact that an overall similar approach and methodology was used for designing these projects targeted at promoting rehabilitation of watersheds of these rivers. The analysis does not compare progress or results achieved under the three projects as indeed they are at different stages of implementation. This has been clarified in paragraph 21 of the Annex as well as the related table.

Annex 8. Comments of Co-financiers and Other Partners/Stakeholders

Not Applicable

Annex 9. List of Supporting Documents

Project Concept Note. October 26, 2001
Project Appraisal Document. Report No: 28592. Dated May 5, 2004
Mission Aide Memoires – 2003 through 2012
Project Implementation Status and Results Reports (ISRs) – 2003 through 2012
IBRD Loan Agreement. Number 4741-TU, dated October 4, 2004
GEF Trust Fund Grant Agreement. TF No. 53306, dated October 4, 2004
Annual Progress Reports prepared by Project Implementation Unit

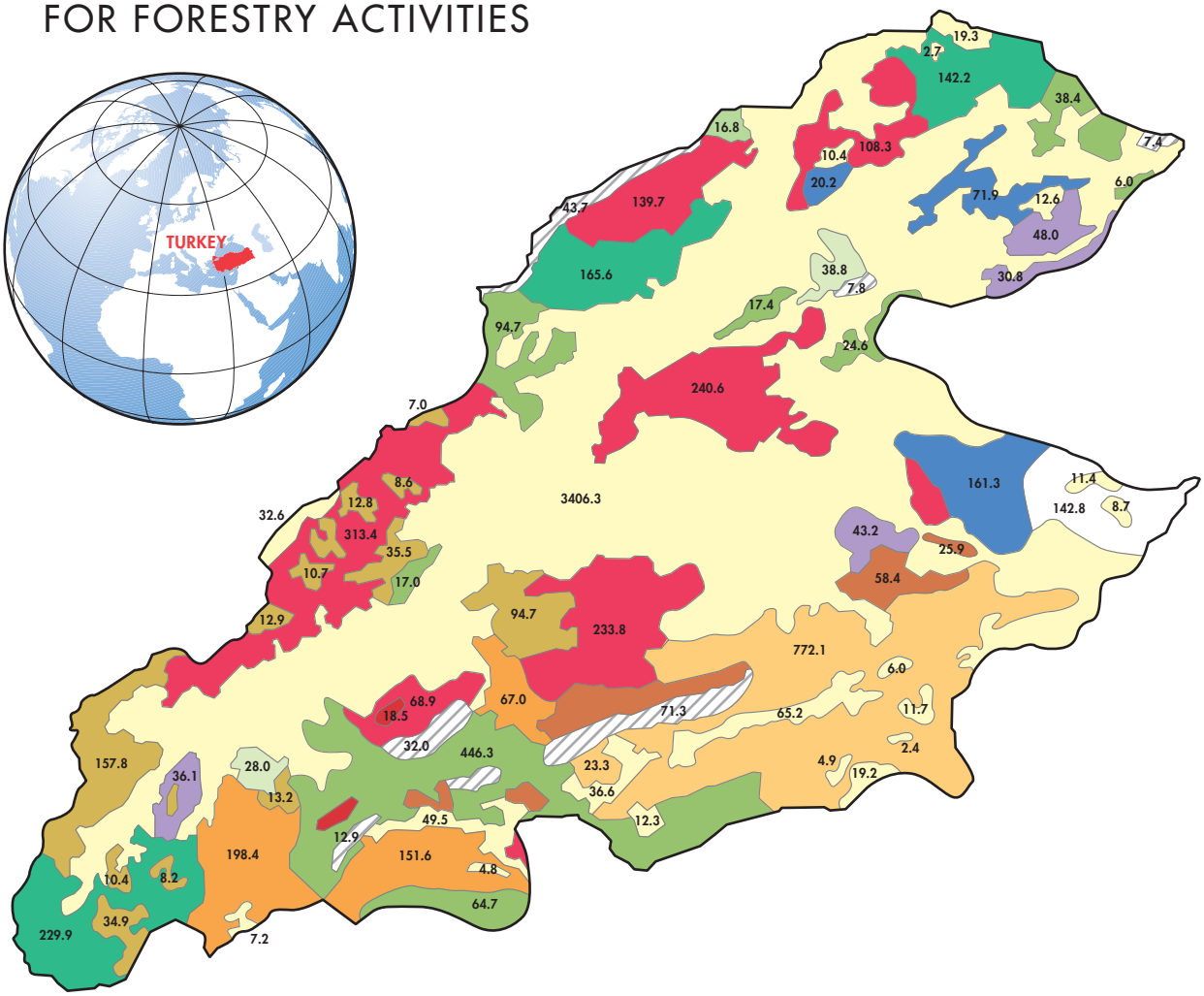
TURKEY

ANATOLIA WATERSHED REHABILITATION PROJECT

SAMPLE MICROCATCHMENT PLAN FOR FORESTRY ACTIVITIES

0 1 2 3 4 5 Kilometers

This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.



Area in hectares:

- REHABILITATION OF DEGRADED AND HIGH FOREST WITH 10% CANOPY CLOSURE (BBK)-423.0
- LITHOZOLIC (Ky)-184.6
- OAK COPPICE REHABILITATION (MsR)-537.7
- SOIL CONSERVATION AFFORESTATION_machinery_potential (Potansiyel TMA_Makina)-171.3
- SOIL CONSERVATION AFFORESTATION_manual_potential (Potansiyel TMA_Isçi)-735.0
- SOIL CONSERVATION AFFORESTATION_machinery (TMA_Makina)-253.5
- SOIL CONSERVATION AFFORESTATION_manual_gully rehabilitation(TMA_Isçi Oyuntu Tahkimi)-18.5
- SOIL CONSERVATION AFFORESTATION_manual (TMA_Isçi)-1136.1
- PRODUCTIVE FOREST (Mb1)-15.8
- WILD TREE GRAFTING_potential (Potansiyel_YAs)-158.1
- WILD TREE GRAFTING (YAs)-66.1
- AGRICULTURAL LAND (Z)-3716.8
- PROTECTION AND IMPROVEMENT OF POOR, DEGRADED AND BARE SOIL_Potential (Potansiyel_ÇZAs)-795.9
- PROTECTION AND IMPROVEMENT OF POOR, DEGRADED AND BARE SOIL (ÇZAs)-417.0

Total area: 8772 Ha.