

ASIAN DEVELOPMENT BANK

TAR:KGZ 38078

TECHNICAL ASSISTANCE

(Financed by the Poverty Reduction Cooperation Fund)

TO THE

KYRGYZ REPUBLIC

FOR

**THE STUDY ON PRICING SYSTEMS AND
COST-RECOVERY MECHANISMS FOR IRRIGATION**

October 2004

CURRENCY EQUIVALENTS

(as of 11 October 2004)

Currency Unit	–	som (Som)
Som1.00	=	\$0.0232
\$1.00	=	Som43.0215

ABBREVIATIONS

ADB	–	Asian Development Bank
DWR	–	Department of Water Resources
MAWRPI	–	Ministry of Agriculture, Water Resources, and Processing Industry
NGO	–	nongovernment organization
O&M	–	operation and maintenance
TA	–	technical assistance
USAID	–	United States Agency for International Development
WUA	–	water user association

TA CLASSIFICATION

Poverty Classification	–	Poverty intervention
Sector	–	Agriculture and natural resources
Subsector	–	Water resource development
Theme	–	Sustainable economic growth
Subtheme	–	Developing rural areas

Following the Board approval of the R-Paper, *Review of ADB's Poverty Reduction Strategy*, staff instructions to replace the PI/CPI classification with a new tracking system are under preparation in line with paragraph 83 of the R-Paper.

GLOSSARY

oblast	–	region
raion	–	district

NOTES

In this report, "\$" refers to US dollars.

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I. INTRODUCTION

1. In December 2003, the Asian Development Bank (ADB), in consultation with the Ministry of Agriculture, Water Resources, and Processing Industry (MAWRPI), initiated a concept paper to study pricing systems and cost-recovery mechanisms for irrigation in the Kyrgyz Republic. The study was subsequently supported for funding by the Poverty Reduction Cooperation Fund. The Fact-Finding Mission visited the Kyrgyz Republic in June 2004 to formulate the technical assistance (TA), and reach an understanding with the Government on the TA goal, purpose, scope, implementation arrangements, cost estimates, financing arrangements, and terms of reference.¹ The TA framework is in Appendix 1.

II. ISSUES

2. The agriculture sector has grown consistently since 1996, with an average annual growth rate of about 7.4% (1996–2002), compared with 4.7% for the economy as a whole. The sector accounts for 35% of gross domestic product (GDP), employs about 52% of total workforce, and accounts for about 11% of exports (2002).

3. About 66% of the country's population lives in the rural areas and is dependent on agriculture for its livelihood. Seventy-five percent of the country's arable land has been reallocated. Arable land represents about 7% of the territory, of which 64% relies on irrigation to enable production. Irrigation is by far the largest water use, accounting for about 90% of the total.

4. In 2003, 40.8% of the population lived in absolute poverty, down from 44.4% in 2002. Nutrition-based poverty declined from 17.8% in 2000 to 9.4% in 2003 (Country Strategy Programming Update, July 2004). Rural poverty declined over 1998–2001, largely due to the better performance of the agriculture sector and higher average real wages. However, rural poverty continues to be significantly higher than urban poverty, with about three quarters of the poor living in rural areas. This is due to the effects of the transition process and particularly to limited rural economic opportunities. Regional differences in poverty are significant. Much of the population lives close to the margin between poor and nonpoor, thus creating a significant degree (about 39% in 2001) of transient poverty.

5. The Government has introduced a number of measures to improve deteriorating infrastructure and to generate long-term growth in agriculture. The Law on Water (January 1994) covers water rights, water resources policy, planning and management, tariff setting, information system and dissemination, and inspection authorities. The law is being replaced by a new water code, which is being considered by the Parliament. The draft water code provides for several changes in how water is managed and controlled. The Law On Water User Associations (WUAs) (February 2002) provides general provisions governing them, and their rights and responsibilities, including rights to establish and collect water charges, retain revenues, and make decisions on operation and maintenance (O&M), distribution of water, and improvement of on-farm irrigation systems within the WUAs' jurisdiction. The WUAs are a means of facilitating the collection of water delivery charges and service fees, and enhancing the efficiency of water use.

6. The Department of Water Resources (DWR) is responsible for administering all agricultural water resources. The regional DWR has a comprehensive role in the administration of irrigation water, including operation of the main systems and reservoirs; design, construction,

¹ The TA first appeared in *ADB Business Opportunities* (Internet edition) on 12 February 2004.

and rehabilitation of canals and structures; drainage and land reclamation; establishment and administration of water quotas; control of the irrigation system; and selling water to farms. The district DWR is responsible for coordinating all local government activities, including irrigation water management and negotiation of water supply contracts. The district officers report to the oblast DWR, which, in turn, reports to the minister and governor of the region. Village governments have mixed roles and functions, including collection of water fees and administration of irrigation.

7. DWR has insufficient resources to provide a comprehensive system of water management from the watershed to the farm head gates due to the following:

- (i) The Republican budget is limited and the Government is substantially dependent on budget support from the European Union Food Security Program.
- (ii) The water fee of Som0.03 per cubic meter, if fully collected, would only cover about 30% of O&M requirements.
- (iii) Parliament sets the water fees, although this is proposed to change under the draft water code.
- (iv) While about 80% of water fees are collected annually, only about 30% are in cash, making it difficult for DWR to sell in-kind contributions, such as labor and materials for O&M works.

The drainage and irrigation system has thus been deteriorating, lowering productivity and agricultural growth. The rapidly changing farm structure makes it difficult for DWR and the decentralized departments to administer water quotas and irrigation regimes to these small farm units. As drainage and irrigation facilities deteriorate, poverty will increase as farmers' incomes diminish.

8. WUAs are being required to take more responsibility for O&M and capital investment. Under the World Bank's On-Farm Irrigation Project and ADB's Agriculture Area Development Project, drainage and irrigation systems are being rehabilitated, with WUAs required to fund all O&M and 25% of rehabilitation costs. WUAs will be required to improve the drainage and irrigation infrastructure to suit the changing ownership and structure of farms. WUAs could become responsible for inter-farm infrastructure, particularly as DWR has insufficient resources for O&M of off-farm infrastructure. Pricing and cost-recovery practices vary among WUAs and include volumetric, based on the quantity of water used, and flat rates, based on area irrigated. Some WUAs combine both. The method used must provide for fair and equitable charges and facilitate the efficient use of water.

9. A comprehensive study of water cost, O&M of drainage and irrigation, and pricing and recovery of costs to ensure a sustainable drainage and irrigation system is timely given (i) deteriorating infrastructure; (ii) importance of irrigated agriculture to rural livelihoods, particularly the poor; (iii) limited resources for O&M; (iv) current state of WUAs' development; and (v) current and proposed investments in rehabilitation by ADB and the World Bank. The study will review the situation, focusing on the cost of supplying irrigation water, and on the ability and willingness of WUAs and farmers, particularly the poor, to recover capital investment and O&M costs. While poor farmers are not necessarily significantly disadvantaged in terms of land ownership and farm size,² they may have more marginal land on the perimeter of the irrigation

² Another Poverty Reduction Cooperation Fund-financed study will more closely examine land issues: ADB. 2004. *Technical Assistance to the Kyrgyz Republic for A Study of the Impact of Land Reform on Agriculture, Poverty Reduction, and Environment*. Manila.

system with variable water supply, have less access to inputs and credit, and, therefore, more difficulty in increasing productivity and profitability of their farm than more affluent farmers. Low irrigation charges can disadvantage the poor as they have no incentive to use water efficiently. Availability of and access to water can decline, the less poor often receive less than their share, and, consequently, incomes decline. A pragmatic approach to pricing and cost recovery of investment and O&M expenses—which also takes account of local socioeconomic, political, and institutional circumstances, and of the difference in farm size, income level, and gender—is essential to ensure that the income and livelihood, especially of poor farm households, are not substantially adversely affected, and to ensure the sustainable use of scarce water resources. The study will identify alternative pricing and cost-recovery mechanisms that will be realistic for poor users but also ensure efficient and sustainable use of water. The study is expected to not only serve the Kyrgyz Republic but also be relevant to other countries, particularly in Central Asia, in determining and recommending pricing schemes and cost-recovery mechanisms for drainage and irrigation systems.

III. THE TECHNICAL ASSISTANCE

A. Purpose and Output

10. The goal is to improve the sustainability and equity of drainage and irrigation services, particularly for poor farmers. The purpose is to identify and formulate appropriate pricing systems and cost-recovery mechanisms that reflect the ability and willingness of farmers to pay.

11. The TA will have four outputs: (i) current cost and revenue of drainage and irrigation services will be determined, (ii) ability and willingness to pay for water and drainage and irrigation services assessed, (iii) a set of alternative pricing systems and cost-recovery mechanisms for irrigation infrastructure investment and O&M suitable for WUAs developed, and (iv) information gathered disseminated.

B. Methodology and Key Activities

12. The TA is a detailed study of the legislation and institutional framework, cost of water and off-farm and on-farm drainage and irrigation services, and mechanisms for cost recovery, including various pricing systems used, ability of Government and users to pay, and willingness of users to pay. Recommendations appropriate to socioeconomic circumstances will be made to support the adoption of efficient and effective pricing and cost-recovery mechanisms that accommodate differing ability and willingness to pay among farmers, particularly the poor.

13. The study will select up to four drainage and irrigation systems in the north and south to provide a representative sample of various systems, including gravity and pump systems, rehabilitated and non-rehabilitated systems, and effective and ineffective WUAs. A broad-based participatory approach involving all levels of government, WUAs, nongovernment organizations (NGOs), funding agencies, and users will be adopted to ensure widespread involvement and agreement to the analysis and recommendations. The participatory approach will be pursued through the establishment of a multi-stakeholder study coordination group, extensive group interviews, a comprehensive and in-depth survey, and local and national seminars and workshops.

14. The key activities will include the following:

- (i) Review the key literature on pricing systems and cost-recovery mechanisms in relevant countries; and key policy documents and legislation of the Kyrgyz

Republic, including various decrees, Law on Water, Law on Water User Associations, and draft water code, to determine the current legal framework and identify any issues.

- (ii) Analyze DWR costs and revenues from the national to village levels to determine the ability to fund off-farm O&M.
- (iii) Review the development of WUAs under the On-Farm Irrigation Project and Agriculture Area Development Project to identify the various practices with respect to pricing systems and cost recovery mechanisms.
- (iv) Conduct a field survey of up to four drainage and irrigation systems to determine the costs of water, O&M, and capital investment. The survey will include at least two systems under either the On-Farm Irrigation Project or Agriculture Area Development Project. The survey will provide information on the key elements that influence the ability and willingness to pay for irrigation water and how they can be addressed. Pricing systems will be evaluated for their appropriateness and implementation effectiveness. For each system, WUAs' capacity to undertake repair and maintenance will be assessed in terms of availability of and access to required machinery and equipment, and arrangements within the WUA. The survey will be quantitative and qualitative.
- (v) Based on the results obtained from activities (i) to (iv), alternative pricing systems and cost-recovery mechanisms will be formulated and proposed to remove the key constraints on willingness and ability to pay, and take into consideration the final beneficiaries' real ability to pay. The costs and benefits of each alternative will be identified and evaluated.
- (vi) The survey methodology and study results will be discussed with the main stakeholders. The results will be disseminated as widely as possible through workshops and seminars. A public awareness campaign will be prepared to encourage the irrigation water users of the need and importance of adopting appropriate cost-recovery mechanisms for the long-term sustainability of the irrigation systems. The results of the study will be used to prepare the second agriculture area development project scheduled for 2006.

15. The final step in the TA will be the publication of the study in English and Russian, with a summarized version in Kyrgyz, in appropriate forms and mediums to maximize its distribution. An outline of the study report is in Appendix 2.

C. Cost and Financing

16. The total cost of the TA is estimated at \$375,000, comprising \$152,400 in foreign exchange and \$222,600 equivalent in local currency. ADB will finance \$300,000 equivalent comprising the entire foreign exchange cost and \$147,600 equivalent of the local currency costs. The TA will be financed on a grant basis by the Poverty Reduction Cooperation Fund and administered by ADB. The Government, through the provision of counterpart staff, office space and facilities, data and documents, and participation of the study working group, would finance in-kind the remaining portion of the local currency costs equivalent to \$75,000. See Appendix 3 for the cost estimates and financing plan.

D. Implementation Arrangements

17. The Executing Agency will be MAWRPI. It will form a study coordination group chaired by the deputy minister of DWR, with representatives from the Ministry of Finance, projects

funded by the World Bank and United States Agency for International Development (USAID),³ NGOs, WUAs, and ADB; and the study team leader. Other relevant agencies can participate as required. The study coordination group will report to the minister of MAWRPI, and meet regularly to provide feedback and guidance on the study process and working papers.

18. Up to 7 person-months of international consultant services will be required from an agricultural economist (team leader, 3 person-months) and water resources manager (2 person-months), with 2 person-months unallocated. Up to 36 person-months of local consulting services, as required, will be recruited in water resources management (deputy team leader, 6 person-months), WUAs (6 person-months), legal services (4 person-months), agricultural economics (6 person-months), and social and gender analysis (6 person-months). The unallocated 8 person-months are to accommodate extensions of the above expertise or to recruit expertise identified during the course of the study. An international consulting firm will be engaged in accordance with ADB's *Guidelines on the Use of Consultants*, using the quality- and cost-based selection method and biodata technical proposals, and other arrangements satisfactory to ADB for the engagement of domestic consultants. Outline terms of reference for consulting services are in Appendix 4. Consultants will purchase equipment, in accordance with ADB's *Guidelines for Procurement*.

19. At least six workshops and seminars will be conducted to obtain feedback from the various stakeholders and to discuss the study's findings and outcome. These will be disseminated through a public awareness campaign via various media, and through a CD-ROM,⁴ maintained in MAWRPI, compiling the consultants' work.

20. The TA will commence about December 2004 and be implemented over 6 months. An inception report for the study will be prepared at the end of the first month, followed by a meeting of the study coordination group. The inception report will outline the study, and summarize the literature and legislation reviews, the participatory approach being adopted, selection of systems, survey methodology, and a study schedule. An interim report will be submitted at the end of 3 months. A draft final report will be submitted at the end of 5 months, followed by a national workshop. Following the workshop and comments by all stakeholders, the final report will be submitted.

IV. THE PRESIDENT'S DECISION

21. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of \$300,000 to the Government of the Kyrgyz Republic to be financed on a grant basis by the Poverty Reduction Cooperation Fund for the purpose of The Study on Pricing Systems and Cost-Recovery Mechanisms for Irrigation, and hereby reports this action to the Board.

³ Recently USAID started implementing a regional project to support WUA development in the Kyrgyz Republic, Tajikistan, and Uzbekistan.

⁴ Compact Disk-Read Only Memory.

TECHNICAL ASSISTANCE FRAMEWORK

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions
<p>Sector Goal Sustainability and equity of drainage and irrigation services improved, particularly for poor farmers</p>	<p>Agricultural productivity increases on irrigated farms</p> <p>Increased efficiency in water use</p> <p>Increased operation and maintenance (O&M) budget for Government and water user associations (WUAs)</p> <p>Poor farmers sustain access to irrigation services</p>	<p>Government, Asian Development Bank (ADB), World Bank, and other reports on O&M of drainage and irrigation systems, poverty and agriculture performance</p>	
<p>Purpose Appropriate pricing systems and cost-recovery mechanisms that reflect farmers' ability and willingness to pay are identified and formulated</p>	<p>Alternative pricing systems and cost-recovery mechanisms accepted by the Government and various stakeholders</p> <p>Publication of study</p>	<p>Published report</p> <p>Technical assistance completion report</p>	<p>The Government continues to place priority on improving irrigated agriculture to promote economic growth and reduce poverty.</p> <p>The recommended measures for pricing system and cost recovery are efficiently and effectively implemented.</p>
<p>Outputs 1. Current cost and revenue of drainage and irrigation services determined</p>	<p>Working paper assessment and conclusions accepted by stakeholders and ADB</p>	<p>Review missions Workshop reports</p>	<p>The study team, the Ministry of Agriculture, Water Resources and Processing Industry (MAWRPI), and other agencies involved maintain a good working relationship.</p> <p>The Government is open to creative suggestions and is willing to change.</p>

Continued on next page

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions
2. Ability and willingness to pay for water and drainage and irrigation services assessed	Working paper on the findings, including details of the methodology and results of the survey Findings of the working paper accepted by stakeholders and ADB	Review missions Workshop reports	
3. Alternative pricing systems and cost-recovery mechanisms for irrigation investment and O&M suitable for WUAs developed	Working paper proving detailed pricing systems and cost-recovery mechanisms accepted by stakeholders and ADB	Review missions Workshop reports	
4. Information disseminated	Six workshops and seminars held with stakeholders	Proceedings of workshops ADB participation in workshops	Stakeholders participate in soliciting and exchanging views on pricing and cost-recovery issues.
Activities			
1.1 Review all relevant literature, including legislation, affecting pricing, cost recovery, and O&M responsibilities	Month 1	Review missions	
1.2 Analyze Department of Water Resources (DWR) costs and revenues, and assess losses and ability to finance O&M nationally	Month 2		
2.1 Based on 1.2, assess DWR's ability to meet O&M responsibilities	Month 2	Review missions	
2.2 Review development of WUAs under ADB and World Bank projects to identify pricing and cost-recovery practices	Month 1		

Continued on next page

Design Summary	Performance Indicators/Targets	Monitoring Mechanisms	Assumptions
2.3 Survey up to four systems to assess the ability and willingness of farmers to pay	Months 2.0–4.5		
3.1 Based on reviews and surveys, recommend appropriate pricing systems and cost-recovery mechanisms	Month 5	Review missions	
4.1 Organize workshops and seminars to disseminate results and obtain feedback	Variable	Review missions	
4.2 Prepare CD-ROM ^a and final report	Month 6		
Inputs			
TA total cost	\$375,000	Consultant contract	Government provides adequate counterpart funding.
International consulting services	7 person-months	Progress reports	Well coordinated and supported by MAWRPI.
Domestic consultants	36 person-months		
ADB's contribution	\$300,000		
Government contribution	\$75,000 equivalent		

^a Compact Disk-Read Only Memory.

OUTLINE OF THE FINAL REPORT

I. Introduction

- A. Issues to be tackled by the study
 1. Analysis of the costs of water, operation and maintenance (O&M) costs, and rehabilitation costs of drainage and irrigation
 2. Assessment of pricing systems and cost recovery mechanisms
 3. Assessment of the ability of the Government, water users associations (WUAs), and users to pay, and willingness of users to pay
 4. Realistic pricing systems and cost-recovery mechanisms, especially for poor farmers
- B. Methodology of the study
 1. Reviews of the literature, in particular on WUA development and pricing systems and cost-recovery measures being used by WUAs under the World Bank On-Farm Irrigation Project and the Asian Development Bank (ADB) Agriculture Area Development Project
 2. Qualitative and quantitative survey on ability and willingness to pay in up to four drainage and irrigation systems
 3. Data to be disaggregated by gender income level, farm size, or other proxy indicators for poverty

II. Review of Literature

- A. Other countries' good practices in pricing systems and cost-recovery measures.

III. Agriculture Sector of the Kyrgyz Republic: An Overview

- A. Agriculture performance: 1991–2003
- B. Policy reforms and agriculture development, particularly relating to drainage and irrigation
- C. Issues and agenda for action

IV. Legal and Institutional Framework in the Kyrgyz Republic

- A. Outline of changes in legislation and description of key aspects of the legislation relevant to the study
- B. Description of the current institutional framework and responsibilities of agencies for drainage and irrigation
- C. Identification of weaknesses in legislation and institutional framework
- D. Assessment of current governance structure within the WUAs, and between WUAs and local governments

V. Review and Assessment of Current Pricing and Cost-Recovery Mechanisms

- A. Review of the ability of the Department of Water Resources (DWR) to maintain off-farm drainage and irrigation infrastructure
- B. Review of practices in WUAs under World Bank, ADB, and other projects

VI. Survey Methodology and Results

- A. Description of the survey methodology
- B. Results of analysis by system and identification of major factors determining ability and willingness to pay
- C. Extrapolation of results in the context of the Kyrgyz Republic

VII. Implications and Recommendations

- A. Legislation
- B. Organizational arrangements for repair and maintenance, collection of revenue, etc.
- C. Appropriate pricing systems
- D. Appropriate cost-recovery mechanisms
- E. Further research and monitoring and evaluation activities

COST ESTIMATES AND FINANCING PLAN
(\$)

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing^a			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	105,000	0	105,000
ii. Domestic Consultants	0	54,000	54,000
b. International Travel	15,000		15,000
c. Local Travel		5,800	5,800
d. Reports and Communication	1,800	3,400	5,200
2. Publication of Study and CD-ROM Production	8,000		8,000
3. Workshops and Seminars ^b	0	11,000	11,000
4. Office Equipment ^c	6,000		6,000
5. Surveys ^d		48,000	48,000
6. Miscellaneous Administration and Support Costs ^e	0	9,300	9,300
7. Contingencies	16,600	16,100	32,700
Subtotal (A)	152,400	147,600	300,000
B. Government Financing			
1. Office Accommodation	0	17,000	17,000
2. Counterpart Staff Remuneration	0	49,000	49,000
3. Miscellaneous Administration and Support Costs	0	9,000	9,000
Subtotal (B)	0	75,000	75,000
Total	152,400	222,600	375,000

CD-ROM = Compact Disk-Read Only Memory.

^a Financed by the Poverty Reduction Cooperation Fund.

^b Includes at least six workshops.

^c Includes two desktop computers, one printer, and one copy machine. Equipment will be transferred to the Department of Water Resources in the Ministry of Agriculture, Water Resources, and Processing Industry, at completion of the TA.

^d Comprehensive quantitative and qualitative surveys of four irrigation and drainage systems will be conducted, including income and expenditure; returns to agriculture; and willingness to pay for water, operation and maintenance, and investment costs.

^e Includes translation and secretarial services.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Consultant Qualifications and Inputs

1. The technical assistance (TA) will be implemented over 6 months. A total of up to 7 person-months of international consulting services will be required from an agricultural economist (team leader, 3 person-months) and water resources manager (2 person-months), with 2 person-months unallocated.
2. The international consultants will have appropriate qualifications in agriculture, sociology, financial modeling, and water-pricing policy. Experience in transition economies, especially in the Kyrgyz Republic, is desirable. The consultants should have experience in participatory processes and be prepared to coordinate and facilitate stakeholder workshops and seminars.
3. Up to 36 person-months of local consulting services will be required from a water resources manager (deputy team leader, 6 person-months), water user associations (WUAs) specialist (6 person-months), legislation expert (4 person-months), agricultural economist (6 person-months), and social and gender analyst (6 person-months), with 8 person-months unallocated.
4. The unallocated person-months are to accommodate extensions of the experts' services or to recruit other experts during the study.
5. The international consultants will work under the supervision and guidance of Asian Development Bank (ADB) staff and will work closely with Government counterpart staff.

B. Terms Of Reference

6. The specific terms of reference of the consultants are the following:

1. Study Framework

7. To develop a basic framework for the TA study, the consultants will carry out the following:
 - (i) Agree with the Government on the structure, function, and terms of reference of a study coordination group, which will work closely with the consultants in guiding and advising on local issues, and which will include broad stakeholder representation from the grass-roots level, including farmers, representatives of WUAs, and local government officials.
 - (ii) Develop the overall methodology for the study and, in conjunction with the study coordination group, select up to four drainage and irrigation systems in the north and the south of the Kyrgyz Republic, which will provide a representative sample of various systems, including gravity and pump systems, and will include at least two systems under the World Bank On-farm Irrigation Project and/or ADB Agriculture Area Development Project.
 - (iii) Hold a seminar with the study coordination group to define objectives, processes, anticipated outcomes, and time frame.
 - (iv) Hold subsequent seminars with the working group to support the contributions required from this group.

- (v) Conduct broad-based workshops at key stages of the study to consider study findings and provide feedback on the main issues. Mid-stage workshops may be conducted regionally, and a final national workshop will consider the consultants' draft final report.

2. Agriculture Sector Overview

- 8. To develop an agriculture sector overview, the consultants will
 - (i) review agriculture performance of 1991–2003;
 - (ii) review policy reforms and agriculture development, particularly relating to drainage and irrigation;
 - (iii) assess key legislation, including various decrees, Law on Water, Law on Water user Associations, and draft water code, to determine the current legal framework and identify any issues; and
 - (iv) identify weaknesses in the policy and legislative framework.

3. Institutional Arrangements

- 9. To determine the appropriate institutional arrangements for sustainable drainage and irrigation services, the consultants will undertake the following activities:

- (i) Outline the current institutional framework and responsibilities of agencies for drainage and irrigation.
- (ii) Concisely analyze the roles of the Department of Water Resources (DWR) clearly distinguishing between central, oblast, and raion levels, and identifying the lines of management, financial control, and reporting.
- (iii) Concisely analyze the roles and responsibilities of WUAs and village councils in managing irrigation and drainage.
- (iv) Review the development of WUAs under the On-Farm Irrigation Project and the Agriculture Area Development Project, particularly the charters, decision-making process for determining water fees and charges, dispute resolution procedures for nonpayment; participation of women in decision making, etc.
- (v) For each selected irrigated system, assess the capacity of WUAs to undertake repair and maintenance in terms of availability of and access to required labor, machinery and equipment, and arrangements within the WUA.
- (vi) Determine the staff and related costs of DWR, disaggregating them into central, oblast, and raion levels, and of the sample WUAs.

4. Cost of Water

- 10. The consultants will determine the cost of water by doing the following:
 - (i) Carry out a rapid desk study of information on costs of rehabilitation, and operation and maintenance (O&M) of irrigation systems deriving from all recent and ongoing work in the irrigation sector, notably the Agriculture Area Development Project and On-Farm Irrigation Project.
 - (ii) From these data determine the range of costs attributable to the rehabilitation, O&M of irrigation works, dividing these into on- and off-farm costs.

- (iii) For the four irrigation systems selected to represent a cross-section of conditions, carry out a physical assessment of the irrigation system from source of water to points of delivery to the farm.
- (iv) Determine the main system characteristics that affect the costs of rehabilitation, O&M, dividing them into on- and off-farm costs.
- (v) Based on the characterization of the selected irrigation systems, assess the range of rehabilitation, O&M, costs of the system dividing these into on- and off-farm costs, clearly separating the costs of mechanized and hand-labor operations.
- (vi) Identify the apportionment of costs for the rehabilitation, O&M of systems between each level of DWR, village councils, and WUAs.
- (vii) Relate the above apportionment of costs to the revenues of all the institutions contributing to these costs.

5. Returns to Irrigated Agriculture

11. The consultants will estimate the economic and financial returns to irrigated agriculture by carrying out the following activities:

- (i) Survey and analyze the selected irrigation systems' margins associated with irrigated agriculture, and determine the key factors affecting them, including cropping system, use of inputs, on-farm value-added processes, and marketing arrangements. Consider farm size, gender aspects, income levels, etc., which will affect outcomes.
- (ii) Identify the factors that constrain profitability of irrigated agriculture, including access to and affordability of inputs, cost and availability of mechanization, and access to credit and markets. Consider farm size, gender aspects, income levels, etc., which will affect outcomes.
- (iii) Estimate water usage of different cropping systems.
- (iv) Prepare models of cropping systems that will yield high margins, clearly identifying the returns to land, labor, and water.
- (v) Assess the gender division of labor and access to decision making related to irrigated agriculture and irrigation water management, to identify ways to ensure that women farmers' needs and constraints are reflected in the cost recovery and WUA management system.
- (vi) Relate the current returns to irrigated agriculture to the affordability of payments for irrigation water.

6. Cost Recovery

12. The consultants will develop an appropriate cost recovery strategy by undertaking the following activities:

- (i) Review the key literature on pricing systems and cost-recovery mechanisms in relevant countries.¹

¹ As a starting point, the consultants should refer to the following literature: (i) Dole, D. 2003. *Setting User Charges for Public Services: Policies and Practice at the Asian Development Bank*. Manila: ADB; (ii) Johansson, Robert C. 2000. *Pricing Irrigation Water: A Literature Survey*. Washington, DC: World Bank; and (iii) Dinar, Ariel, and Ashok Subramanian, eds. 1997. *Water Pricing Experiences: An International Perspective*. Washington, DC: World Bank.

- (ii) Drawing on the experience of the Agriculture Area Development Project and On-Farm Irrigation Project, and supplemented by studies on the selected irrigation systems, determine how pricing and cost-recovery practices vary among WUAs. These studies will include levels of charges; comparison of alternative bases of charge (volumetric, based on the quantity of water used; flat rates, based on area irrigated; or a combination of both); phasing of payments; and apportionment of payment in cash and kind. Determine if poor farmers have been given special consideration under these projects, and identify the impacts on the poor and their coping mechanisms.
- (iii) In the selected irrigation schemes, survey users for their willingness to pay for water, clearly identifying the factors that influence attitudes, including quantum, basis, and phasing of charges. The survey should be qualitative and quantitative to address all economic, social (including gender and poverty), institutional, and political factors influencing farmers' ability and willingness to pay.
- (iv) Determine how attitudes to paying for water will be influenced by improved levels of margin through better access to inputs and markets.
- (v) Compare recovered and incurred costs, disaggregating all costs and revenues into on- and off-farm.
- (vi) Formulate alternative pricing systems and cost-recovery mechanisms to remove constraints on real ability and willingness of final beneficiaries to pay, reflecting economic, social (including gender and poverty), institutional, and political factors.
- (vii) Evaluate the costs and benefits of each alternative in terms of equitability, affordability to poor users, appropriateness to socioeconomic circumstances, and compatibility with the efficient and sustainable use of water. The evaluation should reflect economic, social (including gender and poverty), institutional, and political factors.
- (viii) Recommend a realistic basis for water charges while ensuring that the Government can provide a sustainable irrigation service.
- (ix) Propose the extent to which individual WUAs can set their own levels and systems of charging, means of penalizing individual farmers or WUAs that fail to meet their financial obligations, and how water charges may be increased as the ability to pay increases through improvement in the profitability of irrigated farming.

7. Dissemination of Information

13. The consultants will develop the framework and specific methodology for disseminating TA findings through the following activities:

- (i) Discuss the survey methodology and study results with the main stakeholders—Government, WUAs, nongovernment organizations, local communities, and users through workshops and seminars.
- (ii) Prepare a public awareness campaign through various media to disseminate the study's findings and outcomes, and to encourage the irrigation water users to adopt appropriate cost-recovery mechanisms for the long-term sustainability of irrigation systems.
- (iii) Use the study results to prepare the second agriculture area development project scheduled for 2006.

- (iv) Prepare a CD-ROM² compiling the consultants' work, and which will be maintained in DWR for dissemination of information.
- (v) Submit an inception report outlining the study, and summarizing the literature and legislation reviews, participatory approach adopted, selection of systems, survey methodology, and a study schedule at the end of the first month, followed by a meeting of the study coordination group.
- (vi) Submit an interim report at the end of 3 months.
- (vii) Submit a draft final report at the end of 5 months, to be followed by a national workshop. Following the workshop and comments by all stakeholders, submit a final report.
- (viii) Arrange for the publication of the study in English and Russian, with a summarized version in Kyrgyz, in appropriate forms and mediums to maximize its distribution.

8. Reporting

14. The consultants will produce the following reports: (i) an inception report at the end of the first month, followed by a meeting of the study coordination group, outlining the study, and summarizing the literature and legislation reviews, participatory approach being adopted, selection of systems, survey methodology, and a study schedule; (ii) an interim report at the end of 3 months; (iii) a draft final report at the end of 5 months, followed by a national workshop; and (iv) the final report, after all stakeholders' comments have been incorporated. The consultants will develop a format for an ex-post impact assessment report to be completed and submitted to ADB by MAWRPI 3 years after completion of the TA.

² Compact Disk-Read Only Memory.