

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
AND TECHNICAL ASSISTANCE GRANT
TO THE
REPUBLIC OF TAJIKISTAN
FOR THE
IRRIGATION REHABILITATION PROJECT**

November 2004

CURRENCY EQUIVALENTS

(as of 31 October 2004)

| | | |
|---------------|---|--------------|
| Currency Unit | – | somoni (TJS) |
| TJS1.00 | = | \$0.3351 |
| \$1.00 | = | TJS2.9839 |

ABBREVIATIONS

| | | |
|-------|---|---|
| ADB | – | Asian Development Bank |
| ARP | – | Agriculture Rehabilitation Project |
| CSP | – | country strategy and program |
| EA | – | executing agency |
| IEE | – | initial environmental examination |
| EIRR | – | economic internal rate of return |
| FAO | – | Food and Agriculture Organization of the United Nations |
| I&D | – | irrigation and drainage |
| GDP | – | gross domestic product |
| IPM | – | integrated pest management |
| LCB | – | local competitive bidding |
| M&E | – | monitoring and evaluation |
| MWRLR | – | Ministry of Water Resources and Land Reclamation |
| NGO | – | nongovernment organization |
| NPV | – | net present value |
| O&M | – | operation and maintenance |
| PMO | – | project management office |
| PRSP | – | Poverty Reduction Strategy Paper |
| RO | – | regional office |
| SDR | – | special drawing rights |
| SCNPF | – | State Committee for Nature Protection and Forestry |
| TA | – | technical assistance |
| WUA | – | water users' association |

WEIGHTS AND MEASURES

| | | |
|----------------|---|--------------|
| ha | – | hectare |
| mt | – | metric ton |
| m ² | – | square meter |
| m ³ | – | cubic meter |
| t | – | ton |

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December.
- (ii) In this report, "\$" refers to US dollars.

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LOAN AND PROJECT SUMMARY

| | |
|-------------------------------|--|
| Borrower | Republic of Tajikistan |
| Classification | Targeting Classification: Targeted Intervention Sector: Agriculture and Natural Resources Subsector: Irrigation and Drainage Thematic: Sustainable Economic Growth |
| Environment Assessment | Category B. An initial environmental examination was undertaken and the summary is in Appendix 4. |
| Project Description | <p>The Project will rehabilitate the selected irrigation and drainage (I&D) facilities in Sughd and Vahdat districts in the Region of Republican Subordination, Farkhor and Pianj districts in Khathlon Oblast, and Rushan district in Gorno Badakhshan Autonomous Oblast. Improved I&D services will cover an area of 47,500 hectares (ha), benefiting 262,000 people whose livelihood depends solely on irrigated agriculture. A population of 57,000 will also gain access to safe drinking water in these areas.</p> <p>The Project will also provide farm support services to increase crop yields and improve on-farm land and water management, as well as capacity building within the Ministry of Water Resources and Land Reclamation (MWRLR) to promote participatory irrigation management through water users' associations (WUAs).</p> |
| Project Description | In addition, the Project will assist the Government in accelerating the implementation of key agriculture sector reforms that have been recommended by the Asian Development Bank (ADB) technical assistance (TA) 4052-TAJ: Farm Debt Resolution and Policy Reforms, particularly in the areas of cotton farm debt, land reform, farm privatization, and water management. The Government has taken a step forward by agreeing to further deepen the reforms in the project areas, including (i) improved farm structure, operations, and management based on market-oriented principles; (ii) removal of cotton production quotas, and involvement of local authorities in directing cotton credit; (iii) issuance of tradable land lease certificates that can then be used as collateral; and (iv) introduction of open cotton sales. |
| Rationale | The agriculture sector plays a significant role in Tajikistan's economy, contributing 22% of gross domestic product (GDP) and employing 52% of the total workforce. Due to the arid climate of the country, irrigation is crucial for agricultural production and 85% of the cultivated area is irrigated. |

Most of the I&D facilities were built in the 1950s and 1960s, and Tajikistan has not been able to maintain them adequately due to the civil war and the lack of financial resources. The decrepit state of the I&D facilities is resulting in a continuing decline in crop yield and farm profitability, excessive water losses, low irrigation efficiency, and rapidly spreading water logging and soil salinization.

Despite the relative abundance of water resources in the country, only about 15% of the 4.6 million rural population are currently served by safe, piped, drinking water. Morbidity due to unsafe drinking water is an acknowledged contributor to poverty in rural areas.

The Project will address these problems by providing cost-effective and priority-based rehabilitation of key I&D facilities and easy-to-maintain rural water supply systems in areas selected through a systematic screening process and stakeholder consultation.

The rehabilitation of I&D facilities will provide the security of water services—the most serious concern of many rural communities according to the social analysis—allowing increased yield and improved operational efficiency of the irrigation systems over an extended useful life. In the longer run, the returns of the investment could be increased substantially, if the ongoing policy reforms are strengthened and deepened. To accelerate the reform process, the Government agreed to implement specific reform actions (see Project Description above) in the project areas, and to monitor and assess—through an open and participatory forum involving development partners, civil society members, and other stakeholders—the impacts for future replication.

Objective

The objective of the Project is to increase farm productivity and income of rural communities, and improve rural potable water supply schemes. The Project will also support policy reforms with regard to cost recovery for operation and maintenance (O&M), cotton financing and marketing, farm restructuring, and farm debt resolution.

Cost Estimates

The total cost of the Project is estimated at \$29.0 million equivalent, comprising \$13.3 million (45.7%) in foreign exchange cost and \$15.7 million (54.3%) in local currency cost. The cost estimates include the allocation of \$4.3 million for taxes and duties and 5% of base costs for physical contingencies.

| | | \$ million equivalent | | | |
|-----------------------|---------------------|-----------------------|---------------|--------------|--------------|
| Source | Foreign Exchange | Local Currency | Total Cost | Percent | |
| Financing Plan | ADB | 13.27 | 9.45 | 22.72 | 78.3 |
| | Government | 0.00 | 6.29 | 6.29 | 21.7 |
| | Total | 13.27 | 15.74 | 29.01 | 100.0 |

ADB = Asian Development Bank.

| | |
|--|--|
| Loan Amount and Terms | The proposed loan from the Special Funds resources of ADB is for Special Drawing Rights (SDR) 15,146,000 (\$22.7 million equivalent) which will have a term of 32 years with a grace period of 8 years, and an interest rate of 1% during the grace period and 1.5% per annum thereafter. |
| Period of Utilization | Until 30 June 2011 |
| Estimated Project Completion Date | 31 December 2010 |
| Executing Agency | Ministry of Water Resources and Land Reclamation (MWRLR) |
| Implementation Arrangements | The Project will be implemented over 6 years, starting in July 2005. The project management structure will rely on the experience gained during implementation of three ADB-financed projects previously executed by MWRLR. A high-level project steering committee established during project preparation will continue to function during project implementation to provide policy guidance and facilitate interministerial coordination at the central level. The minister of MWRLR will be designated as project director with overall responsibility for project implementation. A project management office (PMO) will be established within MWRLR to manage project activities and to liaise with ADB and the coordinating bodies. Five regional offices (ROs) of PMO will be responsible for project implementation in their areas, and will maintain liaison with the PMO, local administration, and beneficiary organizations. The PMO will be led by a full-time manager and the ROs by regional managers. The PMO manager will be nominated by the Government, and endorsed by ADB. The regional managers and key staff will be selected by a panel of experts appointed by the Government and agreed to by ADB. |
| Procurement | The Project will procure machinery, equipment, civil works, services, vehicles, office equipment, and materials. All procurement will be undertaken in accordance with ADB's <i>Guidelines for Procurement</i> . |
| Consulting Services | The Project will provide 78 person-months of international and 606 person-months of domestic consultants in areas for which technical capacity is currently unavailable in MWRLR, including (i) institutional capacity building; (ii) design, preparation/evaluation of bidding documents, and construction supervision; (iii) agricultural support services; and (iv) project management, monitoring, and evaluation. The international consultants will be engaged in accordance with ADB's <i>Guidelines on the Use of Consultants</i> , and other arrangements satisfactory to ADB will be used for the engagement of domestic consultants. |

Project Benefits and Beneficiaries

The Project will directly benefit an irrigation area of 47,500 hectares (ha) and 262,000 people, who depend primarily on irrigated agriculture for their livelihood. The annual output of cotton in the project areas will increase from 38,700 tons (t) to 47,700 t, and of wheat production from 26,800 tons to 32,400 tons. Benefits also accrue from the reduction in pumping costs and savings of O&M costs in the I&D systems, amounting to about \$1.5 million per year.

Rehabilitation of rural potable water supply systems will improve the health standards of 57,000 people, particularly women and children. Organization and training of beneficiary organizations and transfer of management of rehabilitated systems to them will facilitate sustainability of the benefits. In order to assist extremely poor households in the near term, government and project officials have agreed to hire, through project-financed contracts, members of poor and vulnerable groups from local villages for civil works to the maximum extent possible.

The economic internal rate of return (EIRR) of the Project is 20.7% and the economic net present value (NPV) at the discount rate of 12% is \$9.9 million. Sensitivity analysis indicates that the EIRR is robust, despite adverse effects of price and yield declines, benefit delays, and investment cost increases. The farm budget analyses for large and small farms and household plots in each district indicate that farm incomes at all levels will increase with the Project.

Risks and Assumptions

The Project will be ADB's third investment project implemented by MWRLR, which has demonstrated adequate implementation capacity in the past. Thus the risk of implementation delays arising from MWRLR's unfamiliarity with ADB procedures is low. For the Project, MWRLR staff have been closely involved in the project processing throughout project preparatory technical assistance stage and thereafter, and their understanding and knowledge of the Project will also minimize the risk of initial implementation delays that are commonly observed in ADB projects.

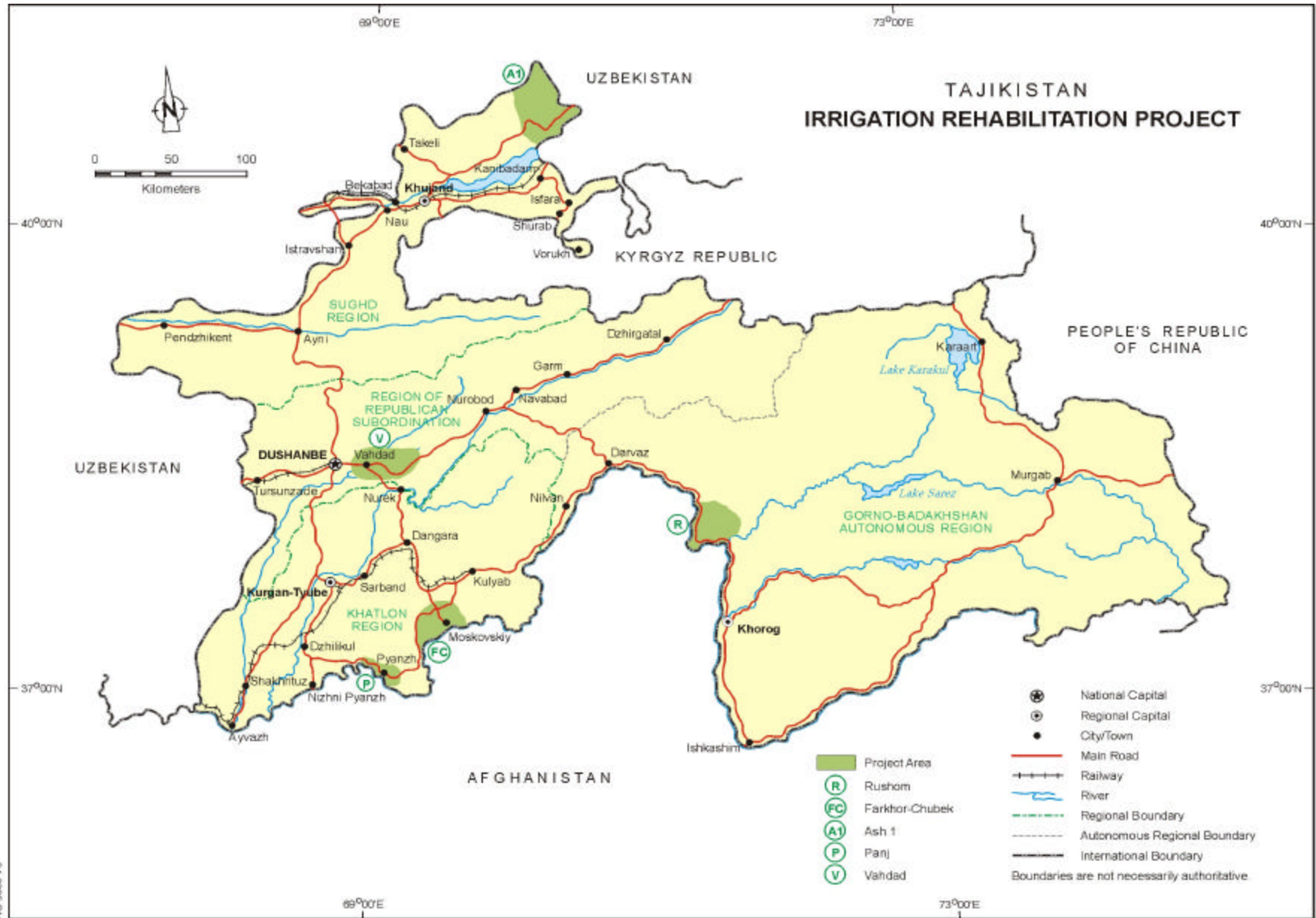
The risk of the rehabilitated I&D schemes not maintained adequately is significant. Clearly, the Government does not have the financial resources to ensure sustainable O&M without relying on recovery of irrigation service fees from beneficiaries. The Project addresses this risk by (i) selecting, through systematic screening and consultation with stakeholders, I&D schemes with low O&M costs; (ii) helping develop participatory management of I&D systems through WUAs; and (iii) assisting MWRLR implement an improved cost recovery policy.

The policy reform program to be implemented under the Project is ambitious, particularly in addressing the vested interests of local authorities, cotton investors, and local government-appointed farm managers. To implement the reforms, the Government needs a high level of political commitment. If the reforms are not implemented properly in a comprehensive manner, rural poverty may significantly deepen—perhaps in the form of further accumulation of cotton farm debts. On the other hand, if the reforms are implemented too rapidly, cotton investors may decide to stay out of the business, thereby effectively taking away the livelihood of many cotton farm workers. To address these risks, the Project will establish an open and participatory forum, involving farmers, local authorities, development partners, civil society and cotton investors, to regularly review and assess the progress and impacts of reforms.

Technical Assistance

The Project provides for an associated technical assistance (TA) for Support for Monitoring Policy Reforms and Improving Farm and Water Management to (i) monitor and evaluate progress in implementing policy reforms in the project areas; (ii) promote competitive providers of farm inputs, technical advice, credit, and marketing of products in the project areas; and (iii) assist the Government in establishing a WUA support unit within MWRLR. The cost of the TA is estimated at \$625,000 equivalent, of which \$500,000 equivalent will be financed on a grant basis by ADB's TA funding program.

The TA will provide for 12 person-months of international and 37 person-months of domestic consulting services. The consultants will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants*. Other arrangements satisfactory to ADB will be used for the engagement of domestic consultants. The TA will be implemented over a period of 24 months, starting in early 2006.



I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republic of Tajikistan for the Irrigation Rehabilitation Project (IRP). The report also describes proposed technical assistance (TA) for Support for Monitoring of Policy Reforms and Improving Farm and Water Management, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, will approve the TA.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

2. At the request of the Government of Tajikistan, the Asian Development Bank (ADB) approved a TA¹ to prepare the Irrigation Rehabilitation Project. The preparatory TA was carried out from January to August 2004. This report and recommendation of the President is based on the consultants' reports, the findings of ADB missions, and discussions with government agencies, potential beneficiaries and nongovernment organizations (NGOs). The Project framework is shown in Appendix 1.

A. Performance Indicators and Analysis

3. The agriculture sector plays a significant role in Tajikistan's economy, contributing 22% of gross domestic product (GDP). This role has increased since independence because the sector has provided an important social safety net as industry has contracted. Currently, the sector generates 30% of export revenues, 35% of tax revenues, and employs 52% of the total work force, despite the fact that only 9% of the total land area is arable. Cereals and cotton are the most important crops, accounting in 2003 for 46% and 32%, respectively, of the sown area.

4. Due to its arid climate, irrigation is crucial for agricultural production, and irrigated areas constitute 85% of total agricultural production areas. Most irrigation and drainage (I&D) schemes were constructed in the 1950s and 1960s. Many have reached the end of their useful lives, and require major rehabilitation. The infrastructure has further deteriorated due to the civil war, lack of capital investment, and inadequate operation and maintenance (O&M) funds. This is worsened by the fact that the end water users have virtually no participation in O&M.

5. The poor condition of I&D facilities results in excessive water losses, low irrigation efficiencies, waterlogging, soil salinization, and declining crop yields. It is estimated that due to the poor condition of I&D infrastructure, 16% of formerly irrigated land has been out of production since 1991. Therefore, rehabilitation of these systems is a key intervention to boost agriculture sector productivity and farm profitability. Inadequate irrigation supplies, insufficient inputs and financing, and lack of agricultural support services have led to a decline in agricultural productivity. Cotton production has fallen from 800,000 tons (t) in 1990 to 450,000 t in 2002. Current cotton yields average 1.7 t/hectare (ha) compared with 2.8 t/ha before independence. Wheat yields are also low at an average of 1.3 t/ha. The reduced productivity resulted in declining profitability of farms and increased poverty incidence in rural areas.

6. Falling on-farm incomes, coupled with the lack of adequate off-farm income-generating opportunities, have been the major factors in the widespread income poverty in the country. The updated World Bank Living Standard Survey (2004) reported that the country's poverty incidence was 70% in 2003, the highest in Central Asia. Poverty is more prevalent in rural areas

¹ ADB. 2003. *Technical Assistance to the Republic of Tajikistan for Water Resources Rehabilitation and Development Project*. Manila.

where more than three fourths of the country's population resides. Half of the workforce is dependent on agriculture for income, the majority of whom rely on miniscule plots of land (about 0.1 ha per household) for their subsistence. Income poverty is severe in the countryside because of lack of income-earning and job opportunities outside the agriculture sector, and the declining productivity of the land. Inadequate irrigation water supplies and farm inputs, imperfect markets, and insecure land tenure rights have contributed to the poor performance of the agriculture sector. Rural poverty is also nonincome based. A key element of nonincome poverty is the lack of safe drinking water, as only 40% of the country's population use piped water.

B. Analysis of Key Problems and Opportunities

7. **Water Management.** The rehabilitation of I&D systems and improved water management are crucial for improving the performance of irrigated agriculture. Since 1991, the majority of pumping stations and the main I&D works have not been properly funded, operated, or maintained. As a consequence, there has been a rapid deterioration of pumping stations, increased water losses in the main canals, and low field-level water-use efficiency.

8. The role of water sector institutions is closely related to performance of the I&D systems and their O&M. The Ministry of Water Resources and Land Reclamation (MWRLR) plays a key role in the administration of water resources. In particular, it is responsible for the construction and O&M of I&D infrastructure and of river regulation works. The O&M of the secondary canal level and the on-farm infrastructure can be divested as the main responsibility of the water users' associations (WUAs). The existing associations operate on the basis of legislation in the Water Code, the Civil Code, and the Law on Public Associations. The ADB-funded TA 4052-TAJ: Farm Debt Resolution and Policy Reforms has made specific recommendations concerning changes to the legal framework to strengthen the water institutions.

9. **Rural Potable Water Supply.** Only about 15% of the 4.6 million people, who live in rural areas, are currently served by drinking water. During the winter months, reduced availability of power supplies typically restrict water supply to 2 hours per day and many rural people pay \$3–5 per cubic meter (m³) to have water delivered by truck to their village. Morbidity due to unsafe drinking water is an acknowledged contributor to poverty in rural areas. There are 669 publicly owned water supply schemes in Tajikistan, but due to lack of funding and damage sustained during the civil war, most of these are in a state of disrepair. Opportunities to improve water supplies are hampered by institutional barriers and existing taxation rules.

10. **Agricultural Support Services.** Most farms suffer from inadequate supplies of inputs, the absence of extension services, and inefficient farm management. Since 1997, the situation has been exacerbated by cotton debt built up, because local intermediary companies, called "investors,"² frequently have a monopoly on the supply of inputs, which are provided late and at inflated prices. Improving access to inputs coupled with the promotion of improved production techniques would increase farm productivity by helping farmers improve crop yields, and diversify cropping to achieve higher revenues (para. 36).

11. **Government Agriculture Sector Policy.** The Government is currently implementing major policy initiatives in the sector: (i) farm privatization, (ii) increasing competition in the

² These are cotton traders/exporters who provide seasonal credit, mostly in kind, to farmers using cotton as collateral. Generally, the local governments nominate one investor per district.

provision of essential agricultural support services, and (iii) price liberalization³ and privatization of agribusiness enterprises. In the medium-term, the Government will focus the reform agenda on (i) reforms of the land and water sectors to increase privatization and cost recovery; (ii) development of a rural finance system; and (iii) restructuring of government institutions to fit a market-oriented economy. The main objectives of the Government's Poverty Reduction Strategy Paper⁴ (PRSP) include better access of the poor to land and water, and the creation of a favorable framework for private sector involvement in agriculture.

12. **Agriculture Sector Reforms.** Since independence, the Government has introduced a range of reforms intended to transform agriculture into a competitive market-oriented sector: (i) the state procurement system for agricultural commodities has been dismantled; (ii) price controls have been reduced; (iii) ongoing land reform allows private farms to operate based on life-long heritable, but not tradable leases; and (iv) irrigation service fees have been introduced, to partly recover O&M costs. However, the implementation of these reforms is poor, because of the lack of adequate capacity and resources of the public institutions to implement the reforms and provide the required services to private farmers, and because of the mindset of the local administrations that continue to interfere with farm management and marketing of produce.

13. Land is the property of the state and farmers are given heritable, but not tradable, land use rights. In 2002, some 500 state farms were transformed into collective farms, joint-stock companies, or cooperative farms.⁵ At present, the lack of information on legal rights, and clear guidelines for the land reform process, leads to exploitation of farmers by local authorities and vested interests. The current cotton farm debt burden (paras. 15 and 16), and inability to transfer and mortgage land use rights, restricts the financing of farm operations and farm restructuring. Since 2004, the Food and Agriculture Organization (FAO) has been coordinating the development of a common strategy for the restructuring of state farms.

14. Irrigation service fees were first introduced in 1996 and collection rates have risen from about 15% in 1997 to 59% in 2003. Until recently, there has been a single national tariff equivalent to \$2 per 1,000 m³ of water delivered to the farm. In June 2004, a regulation was issued by the Government establishing a differential rate for Sughd region, of \$3.30 equivalent per 1,000 m³, because of the high proportion of pump irrigation. Changing the structure of irrigation water fees to reflect differences in system costs (e.g., the high costs of pumping water) would help achieve higher efficiencies in water utilization and agricultural production, more appropriate cropping patterns, and higher productivity and return per unit of water. The Government is also committed under the World Bank Rural Infrastructure Rehabilitation Project to gradually increasing irrigation service fees to finance the full amount of O&M costs.

15. **Cotton Farm Debts.** Tajikistan was a major supplier of cotton fiber to the former Soviet economy. After independence, Tajikistan's cotton lost both its market and source of financing. Therefore, the Government directed loans through the National Bank of Tajikistan to fund cotton production of the state-owned farms, which resulted in huge annual carryover of operating debts. In 1996, this practice was terminated by an agreement with the International Monetary Fund (IMF). To continue funding of cotton production, the Government, in 1997, entered into an agreement to borrow and guarantee a loan of \$60 million from a banking consortium led by

³ The Government has fully liberalized the prices of fruits, vegetables, grain, and livestock inputs and products. However, the cotton sector continues to be affected by low raw seed cotton producer prices, mostly as a result of high levels of taxation and high transaction costs involved in the marketing, transport, and export of lint cotton.

⁴ The Poverty Reduction Strategy Program (PRSP) was approved by the Parliament of the Republic of Tajikistan in June 2002.

⁵ Usually, the farm chairperson holds a land certificate for the farm, and individual farmers are not fully independent.

Credit Suisse First Boston. Funds from this loan were loaned to cotton farms through local investors. However, the manner in which cotton contracts between the investors and farm managers are implemented was often inconsistent with sound financial principles. For example, the production target is not led by farm profitability, but by the production quota determined by the local authorities. The choice of investors is not with the farmers, but with the local authorities. The inputs provided under the contract are often overpriced. Also, there are issues internal to farm management: the “reorganized” farms are run by farm managers appointed by local authorities, and many farm workers are unaware of farm reorganization at all.

16. The lack of competition in cotton financing and processing, and the absence of freedom of choice for farmers has resulted in steady decline of cotton farm productivity and profitability, and the accumulation of debts estimated at \$180 million as of January 2004. ADB has been playing a major role in studying the debt issue and seeking a solution in consultation with the Government and other development partners. In October 2002, ADB sponsored the first roundtable on farm debt and subsequently implemented TA 4052-TAJ: Farm Debt Resolution and Policy Reforms, which recommended comprehensive policy initiatives and specific actions to resolve farm debts, including (i) improving farm structure, operations, and management; (ii) abolishing cotton production quotas, and involvement of local authorities in cotton credit; (iii) issuing tradable land lease certificates that can be used as collateral; (iv) establishing strict lending rules/practices; (v) adopting international cotton grading standards; and (vi) introducing open cotton sales, simplified cotton export procedures, and reduced costs of cotton exports.

17. **External Assistance to Agriculture and Water Sectors.** Most external assistance to Tajikistan has been related to emergencies, structural adjustment, and infrastructure rehabilitation. ADB has financed two projects in the water sector—the Emergency Restoration of the Yavan Water Conveyance Project, and the ARP. ARP supports rehabilitation of I&D facilities; establishment of farm machinery units, seed multiplication, and pest control programs; and supports the construction of rural water supply systems. Various development partners are assisting Tajikistan in implementing agriculture sector reforms. The World Bank has promoted farm privatization, land certificate distribution, rural credit institutions, irrigation rehabilitation, and establishment of WUAs. The United States Agency for International Development (USAID) has supported establishment and development of WUAs. The International Finance Corporation manages a program, creating an example of transparent and profitable cotton production. The European Union has provided grants for development of small businesses, and currently provides support to issue land titles. FAO has established a monitoring mechanism for the land reform process and supported veterinary services in rural areas. The Department for International Development assists in setting up the legal framework for cotton debt dispute resolution. The Swedish International Development Cooperation Agency (SIDA) is providing assistance to cadastral mapping and a land registration. The Government of Japan has provided \$20 million grant for procurement of agricultural machinery and inputs. NGOs such as Cooperative for Asian and Relief Everywhere (CARE), the Aga Khan Foundation, Agence d'Aide à la Coopération Technique et au Développement (ACTED), and Oxfam are involved in rural development and community support. Major external assistance to the sector is shown in Appendix 3.

18. **ADB Country Strategy.** ADB's current country strategy and program (CSP)⁶ identifies rural development as a strategic focus to support more inclusive growth; improve productivity and profitability in the rural sector through institution building that strengthens policy implementation and promotes private sector activities; and improve infrastructure (irrigation).

⁶ ADB. 2003. *Country Strategy and Program (2004–2008): Tajikistan*. Manila.

The CSP update⁷ recognizes ADB's role in spearheading the assistance to the Government in resolving the cotton farm debt issues (para. 15), noting that the cotton debt problem needs to be addressed through a well-designed restructuring program in phases. The CSP also states that ADB will continue its support for (i) rehabilitation of I&D facilities, (ii) improvements in rural potable water supply, (iii) establishment of community-based organizations, and (iv) improvements in agricultural support services and financing.

19. **Lessons Learned.** ADB has financed two projects in the water sector. The first is the already completed Emergency Restoration of the Yavan Water Conveyance Project, and the ARP, for which implementation started in 2003. MWRLR is the Executing Agency (EA) for both projects. The performance of MWRLR in these projects was carefully reviewed, and its strengths (construction supervision and interaction with local authorities) as well as weaknesses (weak coordination with other agencies, and limited planning and design capacity) have been fully reflected in the proposed project implementation arrangements and in drawing the terms of reference for the project consultants. The lessons learned from other water sector projects, have also been incorporated in the Project's design. These include (i) the need to involve the primary stakeholders in construction, monitoring, and supervision of irrigation subprojects; and (ii) the need for clear targets to monitor participatory processes undertaken. To avoid common start-up delays, the staff of MWRLR have been closely involved in preparing the feasibility study, and local authorities have been consulted frequently during project design, so that they may acquire full understanding of the project design and the implementation arrangements.

20. The Project's reform agenda is designed on the experience and lessons learned from other Central Asian countries, particularly Kazakhstan, Kyrgyz Republic, and Uzbekistan. While the progress of reforms in these countries varies, monitoring the impacts of the reforms, particularly in terms of rural poverty, has been often neglected. Applying the reform agenda on a pilot basis, by limiting it in the project-specific context, has a better chance of acceptance, and of scaling up. The experience in the Kyrgyz Republic also shows the need for investment and policy support for the restructured farms, and completion of land reform and farm privatization as the priority reform issues. These lessons have been suitably incorporated in prioritizing and designing the implementation arrangements for the specific reform agenda under the Project.

21. Further, from its various projects in the region, the World Bank⁸ has concluded that (i) proper sequencing is important for successful reform; (ii) the reform agenda must proceed at a pace at which it receives the support of elected representatives and civil society; (iii) delaying investments until the policies are right can reduce the ability to help the poor and can increase the cost of investments; (iv) modest investments combined with focused policy reforms are most likely to be successful; and (v) project design should be simple and, geographically focused.

22. **Project Rationale.** Most of Tajikistan's I&D facilities have long reached the end of their useful life. Major facilities were destroyed during the civil war and the remaining facilities have further deteriorated due to neglected O&M in the postwar period. The worsening condition of I&D infrastructure results in declining crop yields and farm profitability, as well as excessive water losses, low irrigation efficiency, and rapidly spreading land degradation—including water logging and soil salinization. If I&D facilities are allowed to further deteriorate, the country's irrigated area is estimated to be reduced by 20% within 10 years, resulting in a huge disruption in the primary livelihood of a large and poor farming population. In addition, morbidity due to unsafe drinking water is an acknowledged contributor to poverty in rural areas. The Government

⁷ ADB. 2004. *Country Strategy and Program Update (2005–2006): Tajikistan*. Manila.

⁸ World Bank. 2002. *Reaching the Rural Poor in the Eastern Europe and Central Asia*. Washington, DC.

places high priority on restoring and improving the key water sector infrastructure facilities—I&D and rural water supply—toward achieving its goal of reducing rural poverty.

23. The nine districts proposed by the Government for inclusion in the Project were ranked through a systematic screening and stakeholder consultation process. The selection criteria included the need for irrigation infrastructure rehabilitation and low O&M costs; social, financial, and economic indicators; high potential to increase agricultural production; and environmental impacts. Subsequently, irrigation schemes in five districts, covering 47,500 ha, were selected.

24. The Project will support low-income farmers by improving livelihood and income through the provision of improved irrigation and potable water supplies, and the promotion of sustainable and profitable agricultural practices. Improvement in productivity and income that the Project intends to deliver will bring substantial impacts on reducing poverty in the project areas. The returns of investment, however, could still be improved further, if the persisting policy constraints that significantly affect farm productivity and profitability, are addressed. These constraints include slow and uneven progress in farm privatization; continuing strong public authorities' interventions in farm management and in access to credit and inputs; monopoly in cotton financing and marketing; and inadequate O&M of I&D facilities. The Project will assist the Government address these policy constraints by implementing specific reforms within the project areas, and by monitoring and assessing the impacts for future replication.

III. THE PROPOSED PROJECT

A. Objectives

25. The Project's goal is to improve the living standards of the rural population in the project areas. The purposes of the Project are to increase productivity and income of rural communities in the project areas, and to improve the access of the rural population to potable water supply. The Project will cover the four poorest provinces of the country. In the northern province of Sughd, work will be carried out on the Asht-1 irrigation scheme. In the Central Region of Republican Subordination, irrigation systems in Vahdat district will be targeted. In the southern province of Khatlon, work will be done in both Farkhor and Panj districts. In the remote eastern Gorno-Badakhshan Autonomous Oblast, the irrigation infrastructure in Rushon will be repaired. An estimated 262,000 beneficiaries live in the project areas, of whom 153,000 are poor. During stakeholder meetings at the project sites, three general themes emerged as causes of poverty: lack of reliable irrigation and drinking water supplies, limited opportunities to become independent farmers, and lack of jobs. These causes are addressed in the project design.

B. Components and Outputs

26. To achieve higher crop productivity and income of rural communities, the Project will (i) rehabilitate the selected irrigation infrastructure and support improved water management; (ii) rehabilitate the selected water supply schemes and establish water supply committees for sustained O&M; (iii) provide agricultural support to farmers; and (iv) establish appropriate mechanisms for project management, monitoring, and evaluation.

27. The key outputs of the Project in terms of increasing productivity and rural incomes are (i) rehabilitated I&D systems at the project sites, (ii) improved water management, and (iii) improved agricultural practices and technologies. The key outputs to improving access to safe drinking water are the reconstruction of potable drinking water supply systems and improved participatory management of these facilities. The Project's outputs also include the

establishment of a project management office. The Project is also accompanied by a set of assurances by the Government to implement a specific reform program within the project areas. A brief description of project components follows.

1. Rehabilitation of Infrastructure and Support for Improved Water Management

28. In Sughd district (Asht-1 irrigation system), the Project will (i) improve the intake and provide sediment removal facilities; (ii) rehabilitate the lowest pumping station (ANS-1), including replacement of pipeline sections, and construct a protective shelterbelt for pipelines; (iii) rehabilitate pumping stations ANS-2 and ANS-3B; (iv) provide gravity irrigation supply to the upper system levels;⁹ and (v) renovate canal linings, structures, and restore drain capacities.

29. In Vahdat district (Rohati and Dashtibed irrigation systems), the works include (i) rehabilitation of the headworks and a major siphon of the Rohati canal, (ii) rehabilitation of the headworks of the Dashtibed canal and provision of a weir across the Kofarnihon river, and (iii) repairs to selected structures on both systems.

30. In Farkhor district, the Project will focus on improving sediment and water control and prioritized rehabilitation of the Urtaboz pumping system, including (i) improvement of the Chubek headworks, construction of a new sediment removal facility,¹⁰ and provision of sediment removal equipment; (ii) repair of canal linings and control structures and restoration of hydraulic performance of key canals/drains; and (iii) priority rehabilitation of the Urtaboz pumping stations.

31. In Panj district, the rehabilitation work comprises (i) improvement of intake, (ii) rehabilitation of sediment removal facilities/provision of sediment removal equipment, (iii) repair of key control structures, (iv) improvement of hydraulic efficiency of canal/drain sections, and (v) priority rehabilitation of the Fayazabadkala pumping stations.¹¹

32. In Rushon district, the works cover repairs to small systems: (i) rehabilitation of intake works and removal of large rocks from canals, (ii) selective repair of control structures and canal linings, and (iii) restoration of main drains capacity.

33. Desilting of canals and drains within the schemes in Farkhor and Panj districts will be carried out by MWRLR. The Government has given an assurance to ADB that adequate budgetary allocations will be made to complete these works¹² before the award of civil works contracts financed by the Project.

34. **Improved Water Resources Management.** The Project will finance institutional capacity building of the water management agencies and improvement of water management procedures. The Project will also facilitate an increased role for the water users. WUAs will be established in the project areas to ensure sustainable O&M of the rehabilitated systems, and strengthen rural water sector institutions. The goal is to have WUAs operating successfully at the project sites. The formation of WUAs will initially focus on the core demonstration areas, to

⁹ Providing a gravity irrigation supply to an area that at present receives pumped water supplies.

¹⁰ The location of this facility will be decided during the detailed design phase, in consultation with MWRLR.

¹¹ The scope of replacement of pipelines will be reviewed during the detailed design stage, and corresponding budget realignment within the allocation for rehabilitation of the cascades will be made if necessary.

¹² These works involve (i) excavation of 440,000 m³ of sediments from drains, 255,000 m³ from canals, and leveling of 475,000 m³ of previously removed material in Farkhor district; and (ii) excavation of 410,000 m³ from drains, 145,000 m³ from canals, and leveling of 180,000 m³ in Panj district.

showcase improved land and water management techniques. A key element in the Project's WUA strengthening activities is the establishment of a WUA support unit at MWRLR, which will be supported by the TA accompanying the loan (para. 57). The purpose of this unit will be the institutionalization of WUA support, and its integration in MWRLR's planning activities.

2. Agricultural Support to Farmers

35. There are severe deficiencies in the supply of quality seeds and in pest management in the project areas. The ADB-financed ARP already includes subprograms for seed improvement and pest management, implemented by the Agricultural Academy of Sciences. These programs will be extended in the core demonstration areas, where crop husbandry trials will be introduced to promote increased crop productivity, crop diversification, and intensification, together with improved water management practices. Demonstration plots, with a total area of 500 ha, will be implemented in each of the five project areas and training will be provided to district agricultural staff. An integrated pest management (IPM) program will be implemented in each district, to introduce farmers to the IPM concept. The program will be implemented by the Agricultural Academy of Sciences and supported by local and international research institutes. Upgrading the quality of seed and introducing IPM could increase yields by more than 30%.

3. Improvement of Rural Potable Water Supply Systems

36. The Project will support reconstruction of five rural potable water supply systems within the project areas and will provide drinking water to 57,000 beneficiaries. Villages to benefit from the Project were selected in consultation with local communities and MWRLR. Criteria used in selection of target villages included (i) absence of a safe water source at present, (ii) potential for poverty reduction through provision of an improved water source, and (iii) the priority accorded by local community representatives and MWRLR.

37. The main works include (i) construction of intakes, a reservoir, distribution pipework, and standpipes in Asht; (ii) construction of wells, and repairs to reservoirs and distribution network in Vahdat district; (iii) provision of pumps and generators, repairs to reservoirs and distribution pipework in Farkhor; (iv) construction of wells, reservoirs, pumping stations, pipelines, and provision of generators in Panj; and (v) construction of an intake, storage reservoir, and distribution pipework in Rushon. After construction, community-based water committees will operate the systems. The Project, working with the local administration, will facilitate the formation of water committees for each scheme at an early stage of the Project. Furthermore, the communities will provide assistance during construction, in digging pipeline trenches. Training will be given to the water committees to prepare them to carry out their responsibilities.

4. Project Management, Monitoring, and Evaluation

38. The Project will establish and provide support to a project management office (PMO) in MWRLR, Dushanbe and five regional offices (ROs), the one for Vahdat operating out of the PMO in Dushanbe and the others based in their project areas. ROs will be responsible for project implementation in their areas, and for maintaining liaison with the PMO, local administration, and beneficiary organizations. A monitoring and evaluation (M&E) unit will be established within the PMO to implement the environmental monitoring system recommended in the summary initial environmental examination (Appendix 4) and to monitor the economic, poverty, gender, social and environmental impacts of the Project. Specifically, the M&E unit will be responsible for (i) collecting, collating, and analyzing baseline data relating to the economic, poverty, social, and environmental conditions disaggregated by gender, income, and farm types

within the project areas; (ii) benefit monitoring during project implementation; and (iii) evaluating the Project's economic, poverty, gender, social, and environmental impacts within the selected systems. The M&E unit will have two staff members, who will work with the responsible agencies. For environmental monitoring, they will collect and analyze data relating to the quality of I&D water, soil chemistry, and groundwater depth and quality, and will provide a comparison of the before and after project situations. Project performance monitoring and evaluation will be done in accordance with ADB's guidelines on its project performance management system.

39. To monitor the Project's social impact, during the first year of project implementation, the M&E unit will compile a benchmark database on basic economic and social conditions to provide a socioeconomic profile of the beneficiary communities. Key indicators will be tracked during project implementation and a comparison made between the benchmark and project completion situations. The database will be analyzed to provide an assessment of the Project's impact on different social groups, including women and low-income households.

5. Policy Reforms in the Project Areas

40. To deepen the ongoing agriculture sector reforms, the Government has agreed to implement specific pilot-based reform actions in the project areas, including (i) improved farm structure, operations, and management based on market-oriented principles; (ii) removal of cotton production quotas, and involvement of local authorities in directing cotton credit; (iii) issuance of tradable land lease certificates that can then be used as collateral; and (iv) introduction of open cotton sales. These actions would help farms reorganize into a proper size, under self-elected farm managers; accelerate land reforms; and substantially improve the profitability, and hence productivity, of cotton, as well as of other crops. To help the Government successfully implement these reforms, an associated TA is proposed to provide technical expertise and resources, including establishment of an open, participatory framework, involving farmers, local authorities and investors, to guide, monitor, and assess the progress of reforms.

C. Special Features

41. Recognizing and promoting the primary beneficiaries' role in O&M of I&D facilities is an important element in improving system performance, water management, and cost recovery, as well as ensuring equitable distribution of irrigation regardless of gender or poverty. The Project supports participatory irrigation management through development of WUAs, in close collaboration with other development partners, including the USAID, which in principle, agreed to support the establishment of WUAs in the Asht-2 irrigation system in Sughd. The progress and impacts of the reform agenda under the Project will have a significant influence on future sector reforms. Therefore, the Government has agreed to review the Project's reform progress at a national-level forum, involving development partners, NGOs, and other stakeholders. To maximize employment and income-generating opportunities at the project sites, government officials have agreed to hire, through project-financed contracts, poor and vulnerable groups for civil works to the maximum extent possible.

D. Cost Estimates

42. The total cost of the Project is estimated at \$29.0 million equivalent, comprising \$13.3 million (45.7%) in foreign exchange cost and \$ 15.7 million (54.3%) in local currency cost. The cost estimates include \$4.3 million for taxes and duties, and 5% of base costs for physical contingencies. Summary cost estimates are in Table 1, and details are provided in Appendix 5.

E. Financing Plan

43. ADB will finance \$22.7 million, representing 78.3% of total project costs, as a loan from the Asian Development Fund (ADF). ADB will finance 100% of the foreign exchange cost of the Project and 60% of the local currency cost. The Borrower will be the Republic of Tajikistan. The Borrower will provide \$6.3 million equivalent, amounting to 21.7% of project costs. The loan from the ADF will have a term of 32 years with a grace period of 8 years. Interest on the ADF loan is 1% during the grace period and 1.5% per annum thereafter. The summary of the project financing plan is shown in Table 2, while the summary cost estimates are shown in Appendix 5.

Table 1: Cost Estimates
(\$ million)

| Item | Foreign Exchange Cost | Local Currency Cost | Total Cost |
|---|--------------------------|------------------------|---------------|
| A. Base Costs | | | |
| 1. Rehabilitation of I&D Infrastructure | 9.47 | 11.96 | 21.43 |
| 2. Improvement of Water Supply Systems | 1.13 | 1.31 | 2.44 |
| 3. Agricultural Support to Farmers | 0.10 | 0.77 | 0.87 |
| 4. Project Management | 1.83 | 1.47 | 3.30 |
| Subtotal (A) | 12.53 | 15.51 | 28.04 |
| B. Contingencies | | | |
| 1. Physical Contingencies ^a | 0.37 | 0.64 | 1.01 |
| 2. Price Contingencies ^b | (0.32) | (0.41) | (0.73) |
| Subtotal (B) | 12.58 | 15.74 | 28.32 |
| C. Interest Charges^c | 0.69 | 0.00 | 0.69 |
| Total | 13.27 | 15.74 | 29.01 |
| % | 45.74 | 54.26 | 100.00 |

I&D = irrigation and drainage.

^a At 5% for most materials, equipment and civil works.

^b At -1.7% for foreign costs in 2005, -0.8% in 2006, 0% in 2007, -0.9% in 2008, and then at 0.06% per year, based on projections for inflation in US dollar terms; and at 5% per year for local currency costs.

^c Interest during implementation of 1% per annum for Asian Development Fund.

Source: Asian Development Bank estimates .

Table 2: Financing Plan
(\$ million)

| Item | Foreign | Local | Total | % |
|------------------------|--------------|--------------|--------------|---------------|
| Asian Development Bank | 13.27 | 9.45 | 22.72 | 78.3 |
| Government | 0.0 | 6.29 | 6.29 | 21.7 |
| Total | 13.27 | 15.74 | 29.01 | 100.00 |

Source: Asian Development Bank estimates.

F. Implementation Arrangements

1. Project Management, Monitoring, and Evaluation

44. The project management structure will take into account the experience gained during implementation of ADB's projects executed by MWRLR,¹³ the project EA.¹⁴ A high-level steering committee established during project preparation will continue to provide policy guidance and facilitate interministerial coordination.¹⁵ The minister of MWRLR will be the project director with overall responsibility for project implementation. A PMO will be established within MWRLR to manage project activities and to liaise with ADB and with other coordinating bodies. Five ROs will be established, the one for Vahdat operating out of the PMO in Dushanbe and the others based in their subproject area. ROs will be responsible for project implementation in their areas, and for maintaining liaison with local administrations, and beneficiary organizations. The PMO will be led by a full-time manager and the ROs by regional managers. The PMO manager will be nominated by the Government and endorsed by ADB. The regional managers and other key staff will be selected by a panel of experts appointed by the Government.

2. Implementation Period

45. The Project will be implemented over 6 years, starting in July 2005. Project activities during the first year will concentrate on selecting and fielding consultants, procuring equipment, developing operational systems for the PMO/ROs, and training their staff. Field surveys, investigations, preparation of designs and bidding documents, and agricultural support activities in the five project districts will also commence in the first year. The Project civil works will be implemented in separate packages with construction starting in the second half of year 2. The project implementation schedule is shown in Appendix 6.

3. Procurement

46. Machinery, equipment, civil works, and services; vehicles; office equipment; and materials required for project implementation will be procured following ADB's *Guidelines for Procurement*. To the extent possible, the Project will procure similar items in groups to optimize volume discounts. Equipment supply and installation contracts estimated at \$500,000 or more will be awarded on the basis of international competitive bidding. Contracts costing less than \$500,000 will be awarded on the basis of international shopping procedures acceptable to ADB.

47. Each civil works contract estimated to cost the equivalent of \$1.0 million or more will be awarded on the basis of international competitive bidding among prequalified contractors as described in ADB's *Guidelines for Procurement*. Civil works packages costing less than \$1.0 million will be carried out on the basis of local competitive bidding procedures acceptable to ADB. For works whose size, nature, and location make them unsuitable for competitive bidding, and if MWRLR has the facilities and capacity to implement these works expeditiously and at a reasonable cost, ADB may agree to force account procedures. The works to be

¹³ ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Republic of Tajikistan for the Agricultural Rehabilitation Project*. Manila.

¹⁴ EA has been assessed by TA 4052-TAJ, and TA recommendations are incorporated in the project design.

¹⁵ The project steering committee is chaired by the Deputy Prime Minister in charge of agriculture, water, land, and of environment protection. The members of the committee include the Minister of MWRLR, Minister of Agriculture, Deputy Minister of Nature Protection and Forestry, Chairman of State Committee for Land Management, Deputy Minister of Finance, Deputy Minister of Economy and Trade, and Deputy Minister of Health.

implemented through force account will be determined during implementation. The upper limit for a force account works package will be \$50,000. A list of contract packages is in Appendix 7.

48. To procure goods and services with the loan proceeds, the Borrower will need to demonstrate that the local procurement procedures adopted are transparent and efficient, and conform with ADB's anticorruption policy. The EA will certify to ADB that the goods and services financed by the loan are procured from ADB member countries. Where the value of goods financed by the loan exceeds \$1,000,000, a preshipment inspection certificate from an agency, acceptable to ADB, will be required. The award of contracts will be subject to approval by ADB.

4. Advance Procurement Action and Retroactive Financing

49. At the Government's request, ADB has approved retroactive financing of PMO and ROs staff, facilities, and equipment to facilitate timely establishment of these management offices and accelerate project implementation. The retroactive financing will be provided to finance eligible expenditures under contracts approved only on or after appraisal date, and will be subject to a ceiling of \$100,000 equivalent covering the expenses incurred in the period from 16 September 2004 to effectiveness of the Loan Agreement. The Government has been informed that (i) advance action for the procurement of items other than those covered under the retroactive financing will cover actions up to, but not including, contract signing; and (ii) approval of advance action and retroactive financing does not commit ADB to finance the Project.

5. Consulting Services

50. The Project will provide a total of 684 person-months of consulting services, comprising 78 person-months of international consultants and 606 person-months of domestic consultants to supplement MWRLR's project management capacity. To minimize the over reliance on consultants and the burden of consulting services costs, input of international consultants has been kept to a minimum, restricted to areas for which technical capacity is limited in government agencies; institutional capacity-building programs have also been incorporated in the project design. The consultants will assist MWRLR in (i) design, procurement, and construction supervision; (ii) agricultural support services; and (iii) project management, monitoring, and evaluation. These services will be provided by an international consulting firm(s) in association with domestic consulting firm(s) to be engaged by MWRLR in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for the engagement of domestic consultants.¹⁶

6. Disbursement Arrangements

51. An imprest account will be established at a bank acceptable to ADB, to facilitate the timely release of loan funds for payments in local currency. During the first year of implementation, the ceiling of the imprest account will be set at \$500,000. Subsequently, the imprest account ceiling should be 6 months' estimated expenditures or 10% of the loan amount, whichever is lower. The imprest account will be established and managed in accordance with ADB's *Loan Disbursement Handbook*. ADB's statement of expenditures procedures will be used to reimburse expenditures and liquidate the imprest account for payments not exceeding \$100,000 equivalent per payment.

¹⁶ ADB's quality- and cost-based selection method will be used.

7. Accounting, Auditing, and Reporting

52. MWRLR will keep separate accounts and financial statements for the Project, which will be audited annually by independent auditors acceptable to ADB. Loan proceeds will be used for engaging auditors acceptable to ADB. Certified copies of the audited financial statements will be submitted to ADB within 6 months after the end of the fiscal year to which they relate. A separate opinion on the use of imprest account and statement of expenditures procedures will be included in the audit report. The Government was informed of ADB's policy on submission of audited accounts, which covers failure in submitting audited accounts and financial statements within the due date. A formal warning will be issued for accounts more than 6 months overdue and disbursements will be suspended for accounts that are more than 12 months overdue.

53. MWRLR, through the PMO, will submit quarterly and annual reports to ADB. The reports will indicate progress made and problems encountered during the period under review, steps taken to remedy the problems, the proposed program of activities, and expected progress during the remaining implementation period. MWRLR will also provide such other reports and information relating to the Project as ADB may reasonably request, including the Project's environmental impacts, dialogue with beneficiaries, and any social issues relating to the Project. Within 3 months after physical completion of the Project, MWRLR will submit to ADB a project completion report detailing information on project implementation, use of the loan proceeds, and the extent to which the objectives of the Project have been accomplished.

8. Project Performance Monitoring and Evaluation

54. To monitor the progress of physical works, the Project provides for a comprehensive system of performance monitoring and evaluation (para. 39). An M&E unit will be established to monitor project performance, including environmental, poverty, gender, and social impacts as specified in the summary initial environmental examination and the poverty and social assessment, and the progress of various reform measures introduced under the Project, according to the specific monitoring indicators described in the project framework (Appendix 1). The TA accompanying the loan will monitor progress of policy reforms in the project areas, and their impact on farm productivity/profitability, financial gains, farmers' incentives, etc.

9. Project Review

55. The Project will be reviewed regularly by ADB missions. During the third year of project implementation, the Government and ADB will carry out a midterm review to assess the achievement of project objectives. Project objectives will be measured against the performance criteria listed in Appendix 1. The parameters for assessing the implementation milestones will include (i) implementation status, (ii) design and construction standards, (iii) physical progress and disbursements in relation to the implementation schedule, (iv) performance of the consultants and contractors, (v) status of compliance with loan covenants, and (vi) status of achievement of the Project's development objectives. The midterm review will also assess the need for changes in the project, and recommend measures to achieve project objectives.

IV. TECHNICAL ASSISTANCE

56. The objectives of the TA Support for Monitoring Policy Reforms and Improving Farm and Water Management are to (i) monitor progress in implementing policy in the project areas; (ii) promote competitive providers of farm inputs, technical advice, credit, and marketing of produce in the project areas; and (iii) assist the Government in establishing a WUA support unit

within MWRLR. The TA will provide comprehensive monitoring, evaluation, and reporting on progress being made by the Government toward its commitments to accelerate land reform, farm privatization, and farm debt resolution, based on feedback from community and nongovernment organizations and elected representatives. The TA component for the alternative business providers will focus on (i) analyzing the strengths and limitations of existing business providers beyond the services offered by traditional investors, and (ii) providing capacity building for selected providers to expand their services to farmers in the project areas. The TA assistance for the WUA support unit will focus on (i) defining the support unit's mandate, organizational structure, functions, staffing pattern, and legal status; and (ii) providing institutional strengthening and technical advice to ensure that the support unit can properly operate in a sustainable manner. A grant of \$500,000 equivalent¹⁷ financed by ADB's TA funding program will provide the services of 12 person-months of international and 37 person-months of domestic consultants.¹⁸ MWRLR will be the EA for the TA, which will be implemented over a period of 24 months, starting in 2006. The implementation will be divided into two phases—preparation and capacity building. Details of the TA are shown in Appendix 8.

V. PROJECT BENEFITS, IMPACTS, AND RISKS

A. Expected Impacts

1. Economic and Financial Analyses

57. Economic and financial analyses were carried out to assess the economic viability and sustainability of the Project, and the financial viability of the participating farms. The main quantifiable benefits of the investment come from (i) preventing the loss of production that may occur due to further deterioration of I&D facilities without the Project; and (ii) modest increases in yields and cropping intensity resulting from more reliable irrigation water supply, improved seed quality, reduced pests and disease, and improved cropping technologies.

58. Without the Project, declining water supply and increasingly inefficient pumps will have a negative impact on crop yields and the area cultivated. In the pump irrigation areas, the average yield for cotton will decline from the present level of 1.3 t/ha to around 1.1 t/ha, and wheat yields will decline from 2.5 t/ha to 2.2 t/ha. In the gravity-supplied areas, yield declines of cotton and wheat will be slight. With the Project, in the pump irrigation areas, the average cotton yield will increase to about 1.9 t/ha and the wheat yield will increase to 3.3 t/ha. In the gravity areas, cotton yields will increase to 2.0 t/ha and wheat yields will increase to around 3.5 t/ha. The annual output of cotton will increase from 38,700 t to 47,700 t and wheat production will rise from 26,800 t to 32,400 t by the eighth year after implementation. These are conservative assumptions compared with best practices in the area.¹⁹

59. Benefits also accrue from the reduction in pumping costs for water in the pump irrigation area and savings of maintenance costs of the rehabilitated systems. The greater efficiency of new pumps and the conversion of the upper areas of the Asht cascade to gravity supply will

¹⁷ The total cost of the TA is estimated at \$625,000 equivalent. The Government, through in-kind contributions, will finance \$125,000 equivalent.

¹⁸ International consultants will be selected in accordance with ADB's *Guidelines on the Use of Consultants*. Arrangements satisfactory to ADB will be used for the engagement of domestic consultants. Simplified technical proposals and ADB's quality- and cost-based selection system will be used.

¹⁹ The assumed yields for cotton in the future with this Project are attainable given that current best practices in the districts achieve up to 3.2 t/ha for cotton and generally achieve 50% or more on the above current district average yields.

reduce the energy cost of pumping by an estimated \$1,312,500 per year (in economic prices). Rehabilitation of headworks, canal structures, and sediment basins will reduce O&M costs by an estimated \$191,200 per year. Proper O&M for the pumping stations will require an increase in expenditures from the current level of about \$44,000 per year with the Project.

60. The rehabilitation of rural water supply schemes has been assessed separately using the time savings method developed by ADB's Economics and Research Department. The schemes will improve the access of selected villages to a safe water supply and will have health benefits as well as save time spent collecting water. The results of this analysis are consistent with all five schemes having an economic internal rate of return (EIRR) greater than 12%.

61. The EIRR of the Project is 20.7% and the economic net present value (NPV) at the discount rate of 12% is \$9.9 million. The EIRR of the individual district subprojects varies from 13.5% in Rushon to 26.1% in Farkhor. Sensitivity analysis indicates that the EIRR is robust, above 12%, despite adverse effects of price and yield declines, benefit delays, and investment cost increases. The farm budget analyses for large and small farms and household plots in each district indicate that farm incomes at all levels will increase with the Project.

62. A benefit distribution and poverty impact analysis was carried out. The economic benefits are distributed among the three main stakeholder groups with \$0.4 million to farm households, \$7.0 million to *dekhan*²⁰ farms, and \$2.4 million to the Government. A poverty impact ratio of 69% was calculated, indicating that \$6.8 million of the economic benefits accrue to the poor. Detailed economic and financial analyses is shown in Appendix 9.

63. The effect of the intended policy initiatives²¹ has not been taken into account in the financial and economic analyses. However, the implementation of the reform agenda will further increase the projected with-project benefits, and empower private farmers to improve farm financing, management, marketing of produce, and profitability.

2. Impact on Environment

64. An initial environmental examination (IEE) was conducted during project preparation. The IEE confirms that the Project will result in significant positive environmental impacts. The Project does not involve construction of new canals, and will not expand irrigated areas, or pumping capacity. The rehabilitation of I&D systems and improved water efficiency will reduce land degradation from salinity buildup and soil erosion. Coupled with the improvement of rural water supply, the Project addresses two of six major environmental problems in Tajikistan.²²

65. None of the project components is located within a protected area. The ecosystem in the project areas have been extensively modified and as a result both terrestrial and aquatic biodiversity is considered to have been much reduced since the beginning of accelerated agricultural and industrial development in the 1950s.²³ Measures have been proposed to mitigate minor potential negative impacts identified in the IEE. Of these impacts, the most crucial is related to fish movement upstream from the proposed weir on the Kofarnihon river, and the integration of measures to avoid fish entrainment in the rehabilitated intakes. Further study will be undertaken during project implementation. Mitigation measures as well as

²⁰ *Dekhan* farms are privately owned small farms typically based on nuclear or extended families.

²¹ Including farm privatization, removal of interference by the Government in farm operations, inputs sourcing and marketing, and provision of tradable land use rights to farmers in the project areas.

²² ADB. 2003. *Draft Tajikistan Country Environmental Analysis*. Manila.

²³ Due to large-scale hydropower, mining, and logging projects.

environmental management and monitoring have been integrated into the project design and costs.

3. Impact on Living Standards

a. Poverty Reduction

66. The Project will contribute to reduction in income-based poverty by improving farm household incomes through increased farm productivity and increasing employment opportunities. To address this type of poverty, the Project will improve the reliability of irrigation water supplies to 47,500 ha of irrigated land and ensure better, cheaper, and timely access to agricultural inputs. These will benefit 153,000 poor people, generate an increase of 41% in *dekhan* farm incomes and 33% in household plots incomes. Increased agricultural outputs (cotton by 23% and wheat by 21%) will lead to increased rural incomes. Improved agricultural activities will spur the demand for labor estimated at 750,000 labor-days. As illustrated by the distribution analysis, the Project's economic benefits will accrue more to the poor households than other beneficiary groups. Sustained income benefits for poor households will also translate into a decrease, in the medium term, in the incidence of poverty in the project areas by 5%. The benefits accrue at these levels immediately after providing a reliable source of water for irrigation even without institutional reforms being in place. Once such reforms are implemented, the benefits, especially those for the poor, will be even greater.

67. Nonincome-based poverty in rural Tajikistan is also closely related to the lack of clean drinking water. The Project will address this issue by rehabilitating rural water supply systems, and 5,150 poor households will benefit from new potable water supplies. The summary poverty reduction and social strategy is in Appendix 10.

b. Gender and Development

68. An estimated 18% of total households in Tajikistan are headed by women. In rural areas, that percentage increases dramatically. In many rural households, women have the dual roles of both caregiver and breadwinner, as many men have migrated to Russia to find employment. As many of the men do not send remittances to their families from Russia, the women often have to earn income and care for the children at the same time. Women traditionally work in the social and agriculture sectors, where wages are five to eight times lower than salaries in industrial and construction sectors.

69. The Project will improve women's access to food and income-generating activities, and decrease their vulnerability to waterborne diseases. The Project will ensure that female-headed farms in project areas are WUA members and that women are fully represented in project design, planning, and implementation meetings. Women will make up at least 30% of the local water supply committees and they will be provided with training in rural water supply management. Women will be also trained in new agricultural practices. A gender action plan is shown in Appendix 11. The Project will not have any adverse impact on ethnic minorities and will not activate ADB's policy on indigenous peoples.

c. Improved Rural Institutions

70. The Project will explicitly tie or link the physical improvement in irrigation and rural water supply systems with institutional development. Rural institutions to be established and developed include (i) WUAs focusing on improved irrigation management and O&M,

(ii) participatory water supply committees responsible for long-term O&M of the rehabilitated rural water supply systems, (iii) women's groups focusing not only on women-specific activities but broadening the opportunities for women to participate in project activities, and (iv) informal associations of independent farmers formed to take advantage of economies of scale.

d. Land Acquisition and Resettlement

71. There will be limited new construction under the Project. A settling basin will be constructed, on government land near the main canal in Khatlon region. Nine households without title or permission to use the land are presently cultivating approximately 6.5 ha of government land at the potential settling basin site. The household members are not living at the site, but only cultivating land. No structures, therefore, would have to be moved or replaced. The size of the settling basin requires less than half of the land potentially available for construction, and therefore a more advantageous location could be selected, based on detailed topographic surveys. Nevertheless, a short resettlement plan has been developed (Appendix 12) to adequately address and compensate these households, ensuring that their livelihood will not be negatively affected by the construction.

72. In Asht district, the construction of a drinking water reservoir will require a village road to be moved slightly using vacant government land. Additionally, it is possible that a small edge of a household fence, involving an area of less than 5.0 square meter (m²), may also have to be moved, thus, only a short resettlement plan is required. Specific assurances have been obtained from the Government that, should any resettlement become unavoidable (para. 80), the Government will ensure that land acquisition is carried out in accordance with all applicable laws and regulations of the Borrower, and with ADB's policy on involuntary resettlement.

e. Governance and Anticorruption

73. During project processing, ADB's anticorruption policy was explained to the Government. Attention was drawn to the section on fraud and corruption in ADB's *Guidelines for Procurement*, particularly on the need for bidders, suppliers, and contractors to observe the highest standards of ethics in procurement and execution of ADB-financed contracts, and the sanctions if fraud and corruption are discovered. A monitoring system will be established under the associated TA to, among other things, promote transparency in contract awarding and monitor the execution of contracts.

B. Risks and Safeguards

74. The Project will be ADB's third investment project implemented by MWRLR, which has demonstrated adequate implementation capacity in the past. Thus the risk of implementation delays arising from MWRLR's unfamiliarity with ADB procedures is low. For the Project, MWRLR staff have been closely involved in the project processing, and their understanding and knowledge of the Project will also minimize the risk of initial implementation delays that are commonly observed in ADB projects.

75. The risk of the rehabilitated I&D schemes not being maintained adequately is significant. The Government does not have the financial resources to ensure sustainable O&M, without relying on recovery of irrigation service fees from beneficiaries. The Project addresses this risk by (i) helping develop participatory management of I&D systems through WUAs, and (ii) assisting MWRLR implement an improved cost recovery policy. In addition, the project schemes have been selected for low O&M costs; design and procurement of equipment will be

based on energy efficiency; and differential irrigation service fees will be introduced for lift and gravity schemes. Specific assurances in these areas have been obtained from the Government; details of the proposed O&M arrangements are in Supplementary Appendix C.

76. For the farmers to take full advantage of improved and secured irrigation water supply and turn this into improved productivity, they need to access technologies through sustainable institutional arrangements. The Project addresses the risk of a technology gap by providing immediate TA through demonstration farms (para. 36), and by accelerating private sector entry into farm support services (para. 57).

77. The policy reforms to be implemented under the Project is ambitious, particularly in addressing the vested interests of local authorities, cotton investors, and the local government-appointed farm managers. To implement the reforms, the Government needs a high level of political commitment. If the reforms are not implemented properly in a comprehensive manner, rural poverty may significantly deepen—perhaps in the form of further accumulation of farm debts. On the other hand, if the reforms are implemented too rapidly, cotton investors may decide to stay out of business, thereby effectively taking away the livelihood of many cotton farm workers. To address these risks, the Project will establish an open and participatory forum, including farmers, local authorities, development partners, civil society, and cotton investors, to regularly review and assess the progress and impacts of reforms.

VI. ASSURANCES

A. Specific Assurances

78. The Government has given the following specific assurances, which are incorporated in the legal documents:

- (i) **Preconstruction works.** The Borrower will ensure that desilting of canals and drains within the project schemes is carried out, and will provide budgetary allocation to ensure that these works will be completed before the award of civil works contracts financed by the Project.
- (ii) **Environment.** (a) The Project will be carried out, and all facilities constructed, operated, maintained, and monitored, in accordance with the existing laws, regulations, and standards of the Borrower concerning environmental protection, and ADB's environment policy; and (b) the Borrower will ensure that MWRLR implements the environmental mitigation measures and monitoring requirements as outlined in the IEE. Further, the Borrower will assure that an appropriate budgetary allocation (including vehicles, material and equipment, operating expenses, and staff) is provided by MWRLR and the State Committee of Nature Protection and Forestry to fulfill their responsibilities for implementation of mitigation measures and monitoring requirements as outlined in the IEE.
- (iii) **Resettlement.** The Borrower will ensure that involuntary resettlement under the Project, if any, including loss of crops, land, other resources/assets, is undertaken in conformity with a resettlement plan to be prepared by the Borrower in accordance with ADB's policy on involuntary resettlement. The compensation to the persons affected by the resettlement will make them as well off as they would be in the absence of the Project. The resettlement plan will be updated, based on detailed designs, and it will be disclosed to all affected persons in a form and language that they can understand, and it will be submitted with the EA's endorsement to ADB for review and approval before any civil works contract is awarded.

- (iv) **Gender and development.** The Borrower will start, within 1 year of loan effectiveness, implementation of the gender action plan outlined in the summary poverty reduction and social strategy. The Borrower will ensure that (a) the female-headed farms in project areas are WUA members and that women are fully represented in project planning and implementation meetings; (b) women will make up at least 30% of the local water supply committees; and (c) women will participate in all activities in the core demonstration areas and will be trained in new agricultural practices.
- (v) **Operation and maintenance, water service fees, and fee collection in the project areas.** (a) The Borrower will provide adequate budgetary allocation, including that needed to cover the transition period up to full cost recovery and collection of the irrigation service fees; (b) the Borrower will issue a resolution, not later than 31 December 2007, to set differential irrigation service fees for lift and gravity irrigation schemes. These fees will be increased gradually until they fully cover the cost of O&M of the irrigation facilities by 31 December 2010, in line with the Borrower's agreement with the World Bank; (c) the Borrower will provide adequate budgetary allocation, including that needed to cover the transition period up to full cost recovery and collection of the irrigation service fees; and (d) the Borrower will formulate, with the assistance of the Project, a potable water supply cost recovery and fee structure based on assessment of ability to pay, especially of poor farm households, and will, not later than 31 December 2008, implement such a policy.
- (vi) **Water user's associations and water supply committees in the project areas.** Within 3 years of loan effectiveness, the Borrower will ensure that WUAs and water supply committees are established in the project areas, and that the WUAs will assume the responsibilities to carry out the O&M of the on-farm I&D facilities after they are fully organized and trained, but not later than 2 years after rehabilitation of their infrastructure is complete.
- (vii) **Cotton financing and marketing.** Not later than 31 December 2006, (a) the Borrower will insure that Presidential Decree No. 899 of 23 September 2002 be strictly implemented by the regional and district level administrations in the Project area to abolish planning target for cotton production, which sets both the area of farm land for producing cotton and the quantity of fiber to be produced; (b) the Borrower, in consultation with ADB, develop and implement mechanism to ensure that the farm-gate prices for raw cotton will be linked to world prices for cotton fiber; the fixed export price for cotton fiber will be changed from a maximum to a minimum price; and these prices will be published/made available to the public; (c) within the project areas the Borrower will ensure that, in accordance with Presidential Decree No. 899 of 23 September 2002 and Resolution No. 412 of 22 October 1999, the regional and district administration will permit financing by multiple cotton investors, ensure that ginning services are not restricted by administrative boundaries, and permit the movement of raw cotton across the administrative boundaries for ginning and marketing; and (d) the Borrower will, with the assistance of the TA for Support for Monitoring Policy Reforms and Improving Farm and Water Management, develop standard cotton financing and production contracts to ensure introduction of financial disciplines and appropriate allocation of rights, benefits, responsibilities, and risks among the concerned parties. The Borrower will submit such draft standard contracts for ADB's review and, after ADB's approval, implement these contracts in the project areas.

- (viii) **Agricultural support services in the project areas.** Not later than 31 December 2006, with the assistance provided under the Project, the Borrower will (a) develop a farm support service plan and implement measures to improve farm productivity and profitability, through dissemination of market information; provision of farm support services for improved farming technology and crop diversification; and increasing crop value through improved marketing, processing, and adoption of international standards for cotton grading. The Borrower will jointly review with ADB on an annual basis the availability and quality of farm support services; and (b) ensure that the planned and existing farm support services, particularly farm machinery provided through the Japanese Non-Project Grant funded Program are made available to the private farms in the project areas within one year of loan effectiveness.
- (ix) **Farm reorganization and land reform.** The Borrower will develop detailed and transparent procedures, not later than 31 December 2006, acceptable to ADB to (a) implement the Borrower's Resolution No. 522 1996 *Procedure of Reorganization of Farms and Agricultural Enterprises*, to ensure that in the project areas: farmers be allowed to choose which reorganized farm they become members of, and they will elect farm managers who will be accountable to the members; individual farmers be issued with long-term (30-year) certificates of land use rights upon request, and the subcertificates issued to members of collective farms will carry the same legal rights as the certificates; transparent process is set up to obtain land use rights for any individual farmer independent of the collective *dekhan* farms of which they are members; such individual farmers or farmer families are treated equally, as other members of the collective *dekhan* farms, in terms of proportion of debt burden associated with the land to be transferred to them, the land quality, geographic location, and access to irrigation services and other elements affecting farming activities; and (b) prepare amendment to the existing land laws to allow the land use rights certificates held by farms to be used as collateral for financing, and submit the amendment to its Parliament for adoption not later than 31 December 2007.

B. Conditions for Loan Effectiveness

79. The Government has agreed that the establishment of PMO, including appointment of the PMO Manager provision of offices and facilities for PMO, will be a condition for loan effectiveness.

VII. RECOMMENDATION

80. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB and recommend that the Board approve the loan in various currencies equivalent to Special Drawing Rights 15,146,000 to the Republic of Tajikistan for the Irrigation Rehabilitation Project from ADB's Special Funds resources with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board.

17 November 2004

Tadao Chino
President

PROJECT FRAMEWORK

| Design Summary | Performance Indicators/Targets | Monitoring Mechanism | Assumptions and Risks |
|---|--|--|---|
| <p>Goal Improved living standards of the rural population in the project areas (Asht, Farkhor-Chubek, Panj, Vahdat, and Rushon).</p> | <p>Within 8 years from the start of loan implementation:</p> <ul style="list-style-type: none"> • Incidence of income poverty in the project areas is reduced by 5% • Incidence of waterborne diseases in the project areas decreased by 20% | <p>National and regional statistics</p> <p>Project completion report (PCR) and livelihood survey reports</p> | |
| <p>Purpose 1. Increased productivity and incomes of rural communities.</p> <p>2. Improved access to rural potable water supply systems.</p> | <ul style="list-style-type: none"> • Improved agriculture sector policy in terms of agriculture and water sectors financing, farm restructuring and privatization. • I&D infrastructure over an area of 47,500 ha rehabilitated • Average crop yield in the project areas increased by 19% for cotton and 21% for wheat at project completion. • Cropping intensity increased from 100% to 105% in the project areas. • Increase in farm household incomes in the project areas by 10%. • Safe drinking water made available to an additional 51,000 beneficiaries | <p>Progress reports, project performance reports (PPRs), and PCR</p> <p>Progress reports, monitoring and evaluation (M&E) reports, PPRs, review missions</p> | <p>Assumption: National and local governments to sustain and scale up the policy and institutional reforms initiated in the project areas.</p> |
| <p>Outputs 1. Selected irrigation and drainage systems rehabilitated, with arrangements for improved operation and maintenance (O&M) in place.</p> | <ul style="list-style-type: none"> • 250 km of main irrigation canals, 510 km of secondary canals, 425 km of collector drains, 9 pump stations and associated facilities, and 9 headworks will have been rehabilitated. • By 31 Dec 2006, a water users' association (WUA) support unit is established within the Ministry of Water Resources and Land Reclamation (MWRLR) with at least 20% staff being female. • Within 3 years of loan effectiveness, WUAs established in core demonstration areas and at least one third of all WUA members being female. <p>By 31 Dec 2007, an appropriate O&M cost recovery mechanism is established through a government resolution.</p> | <p>Progress reports, PPRs, PCR</p> | <p>Assumption: Farmers are willing and able to pay for the irrigation services.</p> |

Continued on next page

| Design Summary | Performance Indicators/Targets | Monitoring Mechanism | Assumptions and Risks |
|--|---|---|---|
| 2. Potable drinking water supply systems made available in the selected project areas, together with improved management system. | <ul style="list-style-type: none"> • Water supply schemes servicing population of 57,000 • Water supply committees operating in each water supply scheme. At least 30% of committee members are female. • Sustainable O&M of water supply schemes has been developed and implemented. | Progress reports, PPRs, PCR | Risk: Water users are not willing to pay. |
| 3. Improved agricultural technologies made available to farmers. | <ul style="list-style-type: none"> • About 500 ha of agricultural demonstration plots are developed. • Field, water and crop husbandry demonstrations are implemented. • More than 2,500 farmers are trained. About 25% of the trainees will be women farmers. | Progress reports, PPRs, PCR | |
| 4. Enabling policy environment conducive to private sector development of the markets for cotton, wheat, and agriculture inputs established. | <p>Key policy actions initiated in the project areas:</p> <ul style="list-style-type: none"> • By 31 Dec 2006, the farm-gate prices of cotton in the project areas will be based on world price, with the fixed export price of Tajik cotton to become a minimum rather than a maximum price. • By 31 Dec 2006, multiple number of investors will be allowed to operate in the project areas through appropriate government resolution. • By 31 Dec 2006, farmers will be allowed to sell raw cotton to gins of their selection within and outside the district boundaries. • By 31 Dec 2006, all cotton financing and production contracts will be based on the standard, government-approved format that assures financial disciplines and sound business practices. • By 31 Dec 2007, laws will be amended to allow farmers to use their land use right certificate as collateral for bank loans. | <p>Progress reports, PPRs, PCR</p> <p>Progress reports, PPRs, PCR</p> | <p>Risk: Adoption of full policy package is delayed, or not properly implemented</p> <p>Risk: Uncoordinated reforms may aggravate poverty (e.g., investors may stop financing cotton. Investors may take over heavily indebted farms, resulting in asset stripping of farms).</p> <p>Risk: Local authorities may resist the reforms.</p> <p>Assumption: Active participation of major development partners and civil society in the reform process and in monitoring and implementation of reforms.</p> |

| Design Summary | Performance Indicators/Targets | Monitoring Mechanism | Assumptions and Risks |
|---|---|--|--|
| Project Activities 1.1 Design of irrigation rehabilitation schemes. 1.2 Preparation of environmental/resettlement monitoring system. 1.3 Procurement of goods, civil works, and recruitment of consultants. 1.4 Construction supervision. | 24 months after loan effectiveness. 12 months after loan effectiveness. 24 months after loan effectiveness. 24 months after loan effectiveness. | Progress reports, PPRs, PCR, review missions | Assumption: Sufficient Asian Development Bank (ADB) resources made available to support Executing Agency (EA) recruitment and procurement actions. |
| 2.1 Establishment of five WUAs in core demonstration areas, and training of members 2.2 Establishment of WUA support unit, and training of unit staff | 24 months after loan effectiveness. 18 months after loan effectiveness. | Progress reports, PPRs, PCR, review missions | Assumption: Farmers adopt appropriate land and water management practices. |
| 3.1 Design of rural water supply schemes 3.2 Procurement of civil works contractors. 3.3 Construction supervision 3.4 Establishment of Water Supply Committees, and training of committee members 3.5 Formulation of water supply fees structures | 12 months after loan effectiveness. 18 months after loan effectiveness. 18 months after loan effectiveness. 24 months after loan effectiveness. 24 months after loan effectiveness. | Progress reports, PPRs, PCR, review missions | Assumption: Sufficient ADB resources made available to support EA's recruitment and procurement actions. Risk: Water users are not willing to pay. |
| 4.1 Preparation of integrated pest management, seed improvement, and best water management programs 4.2 Establishment of demonstration plots, and training of farmers | 18 months after loan effectiveness. 12 months after loan effectiveness | Progress reports, PPRs, PCR, review missions | |
| 5.1 Recruitment of consultants | 9 months after loan effectiveness. | Progress reports, PPRs, PCR, review missions | Assumption: Sufficient counterpart fund, including budgetary provision for project |

| Design Summary | Performance Indicators/Targets | Monitoring Mechanism | Assumptions and Risks |
|---|---|---|--|
| | | | management office before loan effectiveness, is made available. |
| <p>6.1 M&E system and feedback mechanisms developed under TA for the implementation of policy reforms</p> <p>6.2 Workshops/capacity building for nongovernment organizations to participate in the M&E of the policy reforms</p> <p>6.3 Policy studies to strengthen policy reform agenda and actions</p> | <p>24 months after loan effectiveness</p> <p>24 months after loan effectiveness</p> <p>12 months after loan effectiveness</p> | <p>Progress reports, PPRs, PCR, review missions</p> | <p>Assumption: There is close collaboration with development partners in guiding the reforms, and in monitoring performance and outcomes of the reforms.</p> <p>Assumption: There is active participation of civil society in the reform process and in monitoring the implementation of the policies.</p> |
| <p>Project Inputs</p> <p>Loan Project</p> <p>Consulting Services \$2.2 million</p> <p>Civil works \$5.9 million</p> <p>Equipment \$17.6 million</p> <p>Materials \$0.4 million</p> <p>Training, Extn., Studies \$1.2 million</p> <p>Project operations \$0.8 million</p> <p>Contingencies \$0.3 million</p> <p>Interest charge \$0.7 million</p> <p>Total Project cost \$29.0 million</p> <p>Government \$6.3 million</p> <p>ADB Loan \$22.7 million</p> <p>Complementary TA</p> <p>Consultants \$0.255 million</p> <p>Training, Surveys, Equipment, etc. \$0.070 million</p> <p>\$0.300 million</p> <p>Total TA cost \$0.625 million</p> <p>Government \$0.125 million</p> <p>ADB \$0.500 million</p> | | <p>Loan Agreement, progress reports, PPRs, PCR, review missions, project accounts</p> <p>TA contract</p> <p>TA reports</p> <p>TA accounts</p> | |

AGRICULTURE AND WATER SECTOR ANALYSIS

A. Introduction

1. The agriculture sector resource base covers some 4.07 million hectares (ha) of which 3.3 million ha are permanent pastures. The cultivated area is about 0.84 million ha of which 0.72 million ha are irrigated. Agricultural production is dominated by cotton and wheat, which together account for around 75% of total cultivated area, and provide employment for more than 50% of the country's labor force. The sector generates about 30% of export revenues and 35% of tax revenues. Since independence from the former Soviet Union, allocating sufficient resources to maintain rural infrastructure, including the irrigation systems, has been difficult for the Government and there has been extensive deterioration.

2. During the 1990s, Tajikistan experienced significant increases in the levels of poverty, especially in rural areas. The Government recognizes the need to reduce poverty and increase incomes. The target stated in its Poverty Reduction Strategy Paper¹ is to reduce the poverty level from 83% in 1999 to 60% in 2015.² Since the majority of the poor are in rural areas, these objectives cannot be achieved without effective measures to increase agricultural output and promote agricultural employment. As part of its development strategy, the Government is committed to (i) rehabilitation of key irrigation facilities, (ii) improving the efficiency of irrigation water use, (iii) continuing farm reorganization, (iv) developing a rural credit system, and (v) implementing a poverty reduction program with a substantial agriculture sector component.

B. Sector Performance

1. Agriculture and Land

3. During the 1990s, performance in the agriculture sector was characterized by a decline in the area, yields, and output of the key cotton crop and by an increase in the area and output of cereals. In many areas, food security became of overriding importance. Agricultural productivity is also well below pre-independence levels with average cotton yields currently 1.7 t/ha compared with 2.8 t/ha before independence. Wheat yields are also low at an average of 1.3 t/ha. During the same period, the number of people employed in rural areas rose by over 32%, but much of this employment is intermittent or part time and underemployment in the sector is high.

4. Land remains the property of the state and families either individually or collectively are given land use rights, which are heritable but not tradable. These limitations restrict the evolution of commercial agriculture. The lack of clear procedures under the existing Law on Dekhan Farms adopted in 1992 for land allocation to private farmers and for dispute settlement resulted in local authorities' use of these procedures being viewed as arbitrary. To remove these flaws, the Parliament amended the law in 2002. By the end of 2002, the State Land Committee had transformed some 500 state farms into *dekhan* farms³ but the related land tenure rights remain weak and can be rescinded by local authorities. Only 10% of rural families have direct

¹ The Poverty Reduction Strategy Paper (PRSP) was approved by the Majlisi Oli (Parliament) of the Republic of Tajikistan on 19 June 2002.

² Based on the government-defined poverty level in 1999 of Tajik Somoni 20 per person per month. Appendix 10: Summary Poverty Reduction and Social Strategy contains a summary of the poverty rates estimated for Tajikistan.

³ Dekhan farms are collectively owned farms based on nuclear or extended families.

control over land assets other than household plots.⁴ Many structural, legal, and political impediments prevent a comprehensive implementation of land reform and much of Tajikistan's rural land is managed and operated by collective *dekhan* farms, joint stock companies, or cooperative production farms, which are little different in operation to the old state farms.

5. Since 1997, many farms have accumulated significant amounts of debt, which is linked to the financing of cotton, using the crop as collateral.⁵ More than 70% of farm debt is concentrated within 108 farms that have never repaid any cotton loans.⁶ These collective *dekhan* farms have been reorganized in such a way during the land reform process that any economic incentives to improve performance have been minimized. For this type of farm, the farm managers are largely unaccountable to the members (who are responsible for repayment of the debt). Debt levels are now high enough in many cases to provide a further disincentive to production and are placing a constraint on the further development of irrigated agriculture. Along with policy reforms, it has been proposed by the recently conducted study (technical assistance [TA] 4052-TAJ: Farm Debt Resolution and Policy Reforms) that a financial restructuring of the unprofitable farms be undertaken to resolve this problem.

6. The proposed debt resolution strategy is based on the premise that the solution to farm debt is profitable farms. The main contention of the recent study is that the number of profitable farms will not increase without major restructuring of the existing collective *dekhan* farms and without substantial policy reforms to create an appropriate commercial environment for farm enterprises to grow.

7. Many existing farms as well as newly organized *dekhan* farms suffer from a lack of access to supplies of inputs (including credit) at competitive prices, and technical extension services. The inputs provided by the cooperative *dekhan* farms can be twice as expensive as inputs purchased in the markets, and often the inputs are provided late. Independent *dekhan* farms, on the other hand, are free to purchase inputs they want in local markets at competitive prices, although the lack of alternative sources of credit can affect the production activities of these farms and act as a constraint against achieving higher output levels.

8. Proposed policy reforms for farm debt resolution include (i) farm management reforms to restructure collective farms into smaller manageable farms with farm managers who are accountable to their members; (ii) government reforms to stop issuing cotton production targets; (iii) enacting legislation for land registration and leasehold rights; (iv) reforms on recognition of land and leases as collateral, implementation of loan classification, and investors accepting liability for trade credit; (v) cotton processing and marketing reforms to reduce the costs of cotton exports, force ginneries to compete for raw material supplies and allow open pricing of cotton sales; and (vi) irrigation finance to ensure pricing of water delivery reflects its true costs.

9. Due to the lack of funding and personnel, there is no formal agricultural extension service in Tajikistan. At the district level, agricultural offices try to provide some agricultural extension and advice, but they have limited resources. At the field level, farmers receive little systematic information on agricultural inputs, markets or improved water management

⁴ These and most other land reform issues are being addressed by ongoing World Bank projects, the recently completed Farm Debt Resolution and Policy Reforms TA, some bilateral agencies, and by Food and Agriculture Organization of the United Nations (FAO)-led coordination group monitoring the land reform process.

⁵ During this period, cotton credit has been almost the only source of working capital available to farms and some farm managers freely admit that some of the funds have been used to finance crops other than cotton.

⁶ The TA for Farm Debt Resolution and Policy Reforms (TA 4052-TAJ) has recently completed a detailed study of this issue.

techniques. Independent *dekhan* farmers may seek advice and information from any source but those linked to collective *dekhan* farms have few options to pursue information and extension advice. The World Bank has established a National Agricultural Training Center, and trainees from the center have begun setting up extension services. Improving access to these services could increase productivity by helping farmers to (i) improve crop yields, (ii) intensify their crop rotations, and (iii) diversify their cropping to achieve higher revenues.

2. Water Management

10. Water resources management systems in Tajikistan have not changed significantly since the Soviet period but as agriculture evolves from the former centrally directed model to one where farmers have greater freedom to manage resources these management systems are no longer appropriate.

11. Water users' associations (WUAs) are increasingly providing water management roles and performing on-farm operation and maintenance (O&M). Under the old Soviet system, the collective and state farms acted as the "middlemen" between the large government ministries supplying water and the field level application of water. With the breakup of the Soviet Union, that link or connection between water supply and demand was broken, and there is now a large gap (almost a black hole) between the "big water" suppliers at the ministry, and the "small water" users at the field level. Farm water management at the field level is a vital part of improved irrigation management, but it is a neglected area in Tajikistan's irrigation systems.

12. Rehabilitation of irrigation systems is linked to the cost of maintaining them. The Government's ability to support the cost of O&M is limited and irrigation service fees were therefore introduced in 1996. Irrigation service fees depend on the volume nominally supplied and so depend on the crop grown. The tariff is currently TJS6 (\$2) per 1,000 m³, although the general lack of measuring and metering installations precludes the proper application of volumetric irrigation service fees.⁷ Irrigation service fees are uniform across the country and do not differentiate between gravity and pump irrigation schemes even though energy costs in pump irrigation schemes typically account for at least two thirds of total O&M costs. The water fees at the current level are almost sufficient to cover off-farm O&M costs, excluding the costs of operating and maintaining pump stations. In 2003, reported expenditures on off-farm O&M were about \$5 per ha, compared with an estimated requirement for gravity schemes of \$5.6 per ha. The total O&M costs for pumping, at the current electricity tariff, are about twice the total cost for the gravity schemes. Increasing cost recovery through water fees or payment in kind using community labor is the only possible long-term solution for meeting O&M costs and sustaining the irrigation system.

C. Sector Institutions

1. Legal Basis

13. The Water Code is the legal basis for resource management at present but requires revision to accommodate the concept of basin-wide water resources management and water allocation across sectors. It also needs to be amended to recognize explicitly the role of water as an economic good. Although the Water Code provides for the formation of WUAs, it needs to

⁷ In a number of locations, the MWRLR and its line offices have begun to introduce measuring devices on the tertiary distribution system, for example in parts of the Asht-2 cascade. A Swiss Agency for Development and Cooperation (SDC) project, Integrated Water Resources Management in Fergana Valley, is also introducing measuring devices in pilot areas.

be updated to promote and safeguard their specific requirements through the incorporation of appropriate legal provisions.⁸

2. National Institutions

14. The Ministry of Water Resources and Land Reclamation (MWRLR) plays a key role in the system of water resources administration of Tajikistan. In particular, it is responsible for the construction and O&M of irrigation and drainage infrastructure, and river regulation works. A number of other agencies also hold some water management responsibilities, with monitoring and water management for energy generation being key areas where responsibilities are shared.⁹

15. The fragmentation of responsibilities in the water resources sector and a lack of coordination between the two major water users in Tajikistan limits efficient utilization of available water for both agriculture and power generation. To improve water resource utilization, the Government needs to harmonize the conflicting water requirements of the major users. A river basin or watershed management approach to water resources utilization has generally been accepted by MWRLR as the most appropriate approach to water resources utilization and management. A river basin management approach also implies an institutional framework, which would also redefine the role of MWRLR as either a bulk water supplier or as a regulatory authority.¹⁰

16. The responsibilities of the Ministry of Agriculture include the development of agriculture, ensuring the efficiency of land use and the preservation of the quality of agricultural land. The ministry develops cotton production targets and schedules for *oblasts* and *raions*, which provide the basis for annual irrigation plans prepared at the farm level and approved by MWRLR and its regional and district offices. The ministry also controls the transportation, storage and use of chemical fertilizers and herbicides for cotton production and determines the content of residual quantity of pesticides in water and soil. A major weakness in the sector is that there is no overall agricultural sector strategy and therefore a lack of direction in programs and activities.

3. Local Institutions

17. At the regional and district levels, MWRLR's regional (*oblvodkhoz*) and district (*raivodkhoz*) offices are responsible for the development and distribution of water resources and for the construction and O&M of the I&D networks, from system headworks down to farm boundaries. The district offices make agreements with farms and WUAs for the delivery of water, but these agreements only mention the volume of water to be delivered and make no reference to the timing of deliveries.

18. At the district level the Ministry of Agriculture is represented by the Department of Agriculture within the Hukumat (administrative offices) and the first deputy of the Hukumat is always responsible for agricultural matters within the local administration. The role of the

⁸ A detailed review of the legal and institutional aspects of water management in Tajikistan has been prepared by the TACIS/EuropeAid funded project Aral Sea Water Resources Management Project (ASWERAM: Project 30560: Development of effective integrated water resources management in pilot sub-catchments of the Aral Sea basin).

⁹ To detail the provision of the Water Code, the Government has progressively adopted a series of decisions (*postanovlenye*) calling, in turn, for ministerial orders (*prekaz*) and instructions (*instruktsia*) for their implementation. A list of the water-related legislation in force is shown on Table 1.2, Supplementary Appendix L.

¹⁰ The report on Farm Debt Resolution and Policy Reforms (TA 4052-TAJ) contains a comprehensive analysis of water sector institutional issues. Annex 6 on Water Resources Management, Finances, and Institutions presents an overview of the sector, an analysis of existing institutions, and recommendations for institutional changes.

department is essentially one of planning and coordination of production. It does not include, for example, any extension or technical service for crop production. Under the former system, technical inputs were provided by specialists attached to the *sovkhoses* and *kolkhoses* or by research institutes. In the post-independence period, this system has collapsed and while the Ministry of Agriculture retains its planning and managerial function, the provision of technical services to the sector has largely collapsed.

D. Sector Challenges

19. The principal challenges facing the agriculture and water sectors are to increase agricultural production to benefit all farm households through increased farm productivity, greater employment opportunities, higher incomes, and increased food security. Irrigation infrastructure is a key element in the rural economy but has deteriorated extensively due to the civil conflict and the lack of resources for adequate O&M and investment. Key areas for the future are the O&M and sustainability of irrigation infrastructure, farmer participation in irrigation management, the reduction of farm debt and increased access to credit, improved agricultural support services, and an incentive structure for promoting increased production. In order to provide the resources for continuing maintenance of the irrigation and drainage systems, appropriate scales of payment for water delivery services need to be established, and regular payment of these fees assured.

20. TA linked to the loan will provide for the establishment of a WUA support unit within MWRLR and the institutionalization of water user groups as an accepted part of the overall management of water resources. The TA will also identify measures that can be taken to enhance and strengthen the role of the private sector in the provision of input and output services to the agriculture sector.

21. The Government has already made considerable progress toward the establishment of more sustainable policies for land, agriculture, and water and it is committed to furthering this process and enhancing the performance of the agriculture and water sectors to improve incomes and reduce rural poverty. The Project will support this objective through the rehabilitation of essential irrigation infrastructure in five project areas.

22. Though many rural institutions are weak, there is wide acknowledgement from both government and development partners that change is needed, not least of which is the growing realization that institutional strengthening must go hand in hand with physical rehabilitation. It is anticipated that WUAs will take on increasing importance in Tajikistan's farm water management and O&M. Likewise, village-based organizations developing potable water supply systems need institutional strengthening, to ensure long-term O&M and financial viability. Agricultural institutions need to be refocused on the needs of the farmers, and providing services to farmers, rather than meeting the needs of larger external investors. The rural poor, especially vulnerable groups such as women, also require institutional support and active participation in all project activities. The Project will explicitly provide institutional capacity building in these sectors, to ensure the long-term institutional and financial viability of rural institutions.

MAJOR EXTERNAL ASSISTANCE RELATED TO AGRICULTURE SECTOR

| Project | Fund Source | Amount (\$ million) | Year |
|--|-------------|------------------------|------|
| Institutional Building Technical Assistance Project | WB | 5.0 | 1996 |
| Agriculture Recovery and Social Protection Credit | WB | 50.0 | 1996 |
| Pilot Poverty Alleviation Project | WB | 12.0 | 1997 |
| Postconflict Rehabilitation Credit | WB | 10.0 | 1997 |
| Postconflict Emergency Reconstruction Project | WB | 10.0 | 1998 |
| Structural Adjustment Credit Project | WB | 50.0 | 1998 |
| Emergency Flood Assistance Project | WB | 5.0 | 1998 |
| Structural Adjustment Credit (Supplement) | WB | 6.7 | 1999 |
| Farm Privatization Support Project | WB | 20.0 | 1999 |
| Institutional Building Technical Assistance Project (2) | WB | 6.7 | 1999 |
| Emergency Flood Assistance Project (Supplement) | WB | 2.0 | 1999 |
| Lake Sarez Emergency Mitigation Project | WB | 0.5 | 2000 |
| Rural Infrastructure Rehabilitation Project | WB | 20.0 | 2000 |
| Emergency Drought Assistance | WB | 3.1 | 2001 |
| Structural Adjustment Credit Project (2) | WB | 50.0 | 2001 |
| Second Poverty Alleviation Project | WB | 13.8 | 2002 |
| Pamir Private Power Project | WB | 10.0 | 2002 |
| Community Agriculture and Watershed Management Project | WB | 20.0 | 2004 |
| Subtotal | | 295.0 | |
| Postconflict Infrastructure Program | ADB | 40.0 | 1998 |
| Emergency Flood Rehabilitation Project | ADB | 5.0 | 1999 |
| Emergency Restoration of Yavan Water Conveyance System Project | ADB | 3.6 | 2001 |
| Agriculture Rehabilitation Project | ADB | 35.0 | 2002 |
| Subtotal | | 83.6 | |
| Tajikistan Rural Poverty Reduction Project | JFPR | 2.9 | 2000 |
| Subtotal | | 2.9 | |
| Farm Privatization Support Project | EU, USAID | 1.1 | 1996 |
| Seed Program Project | EU | 11.0 | 1996 |
| Reconstruction, Rehabilitation and Development Program | UNDP | 13.5 | 1996 |
| Farmers' Irrigation Project | USAID | 1.5 | 2000 |
| Dangara Valley Irrigation Project | IDB | 20.0 | 2001 |
| Irrigation Sector Improvement Project | USAID | 2.5 | 2002 |
| Farmer Ownership Model | IFC | 0.25 | 2002 |
| Development of Effective Integrated Water Resources Management (ASREWAM) | EU | | 2003 |
| Water User Association Program (Central Asia) | USAID | 7.5 | 2004 |
| Non-Project Grant funded Aid Program | Japan | 20.0 | 2001 |
| SEF SugdAgroServe/ Farmer Ownership Model | IFC | 0.5 | 2004 |
| Subtotal | | 77.85 | |
| Total | | 459.35 | |

ADB = Asian Development Bank, EU = European Union, IDB = Islamic Development Bank, IFC = International Finance Corporation, JFPR = Japan Fund for Poverty Reduction, UNDP = United Nations Development Programme, USAID = United States Agency for International Development, WB = World Bank.
Source: Asian Development Bank estimates.

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A. Introduction

1. This summary initial environmental (SIEE) examination includes an assessment of environmental benefits, adverse effects, and recommended mitigation and monitoring measures related to the Irrigation Rehabilitation Project in Tajikistan.

B. Description of the Project

2. The objective of the Project is to increase the income of rural communities through: (i) provision of reliable irrigation supplies in the project areas, (ii) improved farm productivity, (iii) improved access to safe water for targeted rural communities, and (iv) policy reforms supporting project implementation. The Project will be located in five districts and will have four components: (i) cost-effective and prioritized rehabilitation of irrigation and drainage infrastructure and support to improve water management covering 47,000 hectares (ha) with a rural beneficiary population of 246,000; (ii) improvement of rural water supply systems for 53,000 beneficiaries; (iii) support to farmers for improved agricultural development with on-farm demonstrations covering 500 ha; and (iv) project management, monitoring, and evaluation.

C. Description of the Environment

3. The climate of Tajikistan is continental, with hot summers and cold winters. Rainfall is low and occurs mainly in winter and spring. Lowland project areas are situated on sloping alluvial outwash fans or level valley floors below and in-between moderate to steeply sloping mountains. Soils are typically silty gray-brown desert soils of alluvial origin and relatively low inherent fertility. In some places loess (wind-blown) soils are irrigated; these are more fertile but suffer from erosion where water is uncontrolled. Soil salinity is a problem in some locations due to high groundwater resulting from excess irrigation and/or poor drainage. One project area lies along the Bartang river in the Pamirs, a tributary of the Panj river which forms the border with Afghanistan. Irrigation water supplies are all taken from surface water. Chemical water quality is generally good. Groundwater is fresh under the larger rivers, but can be saline elsewhere.

4. Tajikistan's wide range of altitudes is home to a rich mixture of ecosystems and has rich biodiversity, however, the ecosystems in project areas have been extensively modified in the last 50 years.¹ As a result, both terrestrial and aquatic biodiversity is considered to have been much reduced since the beginning of accelerated agricultural and industrial development in the 1950s. The project areas are now commercial agricultural landscapes comprising cultivated fields, orchards and vineyards, mulberry and poplar plantations, roads, canals, drains, and built-up areas with houses and gardens. These artificial landscapes provide little habitat for endangered or threatened species. There are no protected areas within the project areas.

5. The project areas are dependent on agriculture. The principal crop within the irrigation systems is irrigated cotton. Most agricultural workers wages are extremely low and often unpaid or made in kind (cotton stalks for winter fuel). Household food security is dependent on

¹ This is due to large-scale projects for irrigation, especially for cotton, hydroelectricity, water reservoirs, mining, agricultural expansion, and logging. Industrial pollution, discharge of mining wastes, use of pesticides, and the construction of infrastructure for water resource development have had a particularly severe impact on aquatic and riparian ecosystems. The protracted civil war and economic problems that followed independence reduced industrial pollution but exacerbated other problems, in particular uncontrolled deforestation for fuelwood, agricultural expansion, hunting, and fires.

household plots, rain-fed winter wheat on former rangeland, limited domestic livestock, and remittances from male household members working seasonally in Russia. There are high degrees of poverty in the project area, whose districts have all been classified as poor, very poor, or extremely poor in a recent national survey.² The rural poor eat an inadequate diet, have insufficient income or production to provide food for all seasons, and have low stocks of food. Malnutrition is widespread.

6. Public health in the project areas is affected by both agricultural practices and problematic drinking water supplies. Food insecurity encourages the expansion of wet rice cultivation close to human settlements, which provides habitat for malaria-transmitting mosquitoes. Most piped water systems have fallen into disrepair. Many rural households now depend on surface water, usually rivers or canals. This water is often of low bacteriological and chemical quality and, together with low levels of hygiene and high groundwater levels in human settlements that adversely affects sanitation, contributes to the high levels of communicable disease, especially amongst children.

D. Potential Environmental Impacts and Mitigation Measures

7. **Environmental Benefits.** The Project will have significant positive environmental impacts primarily through arrested land degradation due to salinity buildup and soil erosion in irrigated areas, and providing rural water supply in the project areas.³ The improvement of intake structures, construction of sedimentation basins, and provision of sediment handling equipment will reduce sediment entering the systems by 70%. The repair of canal lining and key control structures, and the desilting of canals will result in restoration of canal capacity and a reduction in water losses thereby improving water availability. The revegetation of sand dunes will prevent the deposition of saline wind-blown sand on pressure pipes. Desilting drains will improve the drainage system reducing waterlogging and secondary soil salinization. The problem of waterlogging affects not only agricultural areas but also human settlements resulting in higher groundwater, which adversely affects sanitation and causes public health problems.

8. The Project will support sustainable agricultural development including the promotion of integrated pest management. The Project will also support the establishment of on-farm water management demonstration sites in each project area. These will promote the use of techniques such as land leveling and precise irrigation applications, thus promoting improved water use efficiency. Through the provision of safe water supply to rural communities, the Project is expected to result in significant positive impacts on public health, household workload, and quality of rural life. Significant positive impacts on agricultural development and productivity, rural incomes, institutional development, public health, and soil and water resources, brought by the Project will enhance net environmental benefits.

9. **Environmental Issues Related to Project Location.** The Project will rehabilitate existing systems for irrigation water supply, which are based on diversion of river flows. There will be no additional abstraction above preexisting levels except on one mountain stream and therefore no change in river hydrology. The quality and volume of return flows are not expected to change measurably within the lifetime of the Project.⁴ The Project has been designed to avoid

² National Social Investment Fund for Tajikistan (NSIFT). 2002. *Investment Plan for the Second Poverty Reduction Project*. Dushanbe.

³ These address two of the six major environmental problems in Tajikistan (ADB. 2003. *Draft Tajikistan Country Environmental Analysis*. Manila.)

⁴ This assumes complementary activities will not result in significant changes in irrigation system operation and farmer behavior.

involuntary resettlement and impacts due to conflicting land use or additional impediments to movement of people and livestock. Resettlement impacts, if any, will be addressed through a short resettlement plan in accordance with government regulations and approval procedures, as well as Asian Development Bank (ADB) safeguard policies.

10. The settling basins proposed for rehabilitation and construction at canal intakes along the Panj river are adjacent to wetlands in controlled zones along the border with Afghanistan. Measures will be undertaken to minimize impacts on wetland habitats during construction. In Rushon, Farkhor, and Panj districts irrigated areas are subject to bank erosion along the Panj river. The Ministry of Emergency Situations and Civil Defense is undertaking bank protection works in some of these areas. In Sughd region, gravity water supply to the eastern parts of the Asht irrigation scheme adjacent to the project areas is reported to be affected by inadequate irrigation releases from Uzbekistan despite an international water-sharing agreement. Improved cooperation should be sought. In Khatlon region, water is taken from the Panj river, which forms the border with Afghanistan—no additional diversion is considered and the status quo will not be altered by the Project.

11. All drinking water supplies will be from springs or groundwater. Water abstraction will be small scale and will not significantly affect local rivers or aquifers. All centralized water supplies will be disinfected to avoid impacts from poor water quality. The Project will not cause conflicts in water use.

12. **Environmental Issues Related to Project Design.** The project areas rely on surface water diversion for irrigation water supply. Major design issues are (i) management of flood flows at intakes, (ii) capture of water during low flows, and (iii) high levels of suspended sediment. Project investments will be designed to resist flooding and erosion, and to cope with high sediment levels and variable flows. High sediment levels are a major burden on maintenance budgets, but can be reduced by providing settling basins at the main intakes. The Project will ensure that these structures are properly designed and will provide training to ensure efficient operation. Projected return flows from the settling basins and from drainage will not significantly alter downstream water quality either in terms of mineralization or sediment. The Project will assist in minimizing irrigation water supply conflicts by supporting the development of government capacity to promote water users' associations (WUAs), by improving the reliability of the supply and by setting up on-farm water management demonstration areas to promote increased water use efficiency.

13. Consistent with the provisions of the Water Code and associated decree number 437 issued in 2002, the Project will ensure that measures are undertaken to ensure adverse effects on fish resources are mitigated. Of particular relevance to this is the proposed weir on the Kofarnihon river, where possible negative impacts on upstream fish movement has been identified. The initial environmental examination (IEE) proposes a further study and integrate in the Project the measures to avoid fish entrainment in intakes and pumps, if necessary. The proposed study has been included in the terms of reference for consulting services, and will be conducted jointly with the Ministry of Water Resources and Land Reclamation (MWRLR) during the initial state of project implementation. It will recommend appropriate mitigation measures proposing a fixed schedule for their implementation, and will be a precondition to the start of any related construction activity.

14. The Project will promote improved seed production, multiplication, and distribution. These activities will not affect the limited existing agrobiodiversity or wild diversity. Tajikistan is developing policies and capacity in relation to genetically-modified organisms following its

accession to the Cartagena Protocol on Biosafety of the Convention on Biological Diversity. The Project will operate in accordance with the Protocol.

15. **Environmental Issues Related to Construction Stage.** The Project will not involve extensive earthworks on sloping ground, and is not expected to create erosion hazards. Existing gullying in Vahdat district will be dealt with through structural and vegetative measures. Sediment from desilting operations in channels is nontoxic and will be disposed of in fields or other approved sites. All work in or near rivers will be carefully controlled to avoid localized pollution from waste oils and spills of diesel. Work near the Panj river will require security clearance from the border security force and formal confirmation from Russian military authorities that the areas are clear of mines.

16. Health, safety, and environmental management standards during construction will be improved by developing and enforcing relevant contract clauses. In addition to controlling solid and liquid waste disposal and site environmental management especially dust, these clauses will include a requirement for testing oils for polychlorinated biphenyls (PCBs) from any transformers removed from service, and their proper disposal. Careful attention will also be given to transparency in tendering and payment procedures and effective supervision on site. The Project will also provide testing kits to local units of the Sanitary-Epidemiological Station to support drinking water source approval functions.

17. **Environmental Issues Related to Project Operation.** Flood damage to canal intakes will be reduced by appropriate intake strengthening and design. Siltation of canals and sediment damage to pumps will be reduced by providing settling basins. Silt from settling basins will either be disposed of to waste land or flushed back to the main rivers. No significant impacts are expected. Reduced siltation of canals will permit diversion of maintenance funds to desilting of drainage channels, reducing groundwater levels and thereby reducing secondary salinization. Pesticide and fertilizer use may increase if agricultural incomes rise; the Project will train farmers in integrated pest management techniques and no significant negative impacts are expected.

18. A total of \$112,000 or 0.4% of total project costs will be invested for implementing the recommended mitigation measures, excluding consulting services.

E. Environmental Monitoring Program and Institutional Requirements

19. A monitoring and evaluation unit (MEU) will be established within the project management office (PMO) to monitor project implementation, performance, and impacts. Consultants will be engaged to provide further assessment of environmental impacts of project components, evaluate environmental monitoring requirements, and prepare a long-term environmental monitoring program for the Project.⁵

⁵ The environmental monitoring program will have two components: environmental compliance monitoring focusing on ensuring that physical investments are carried out in accordance with relevant clauses in contract documents and Government regulations; and environmental performance monitoring. Environmental performance monitoring will cover: (i) key variables on each irrigation scheme (irrigation water quality, drainage water quality, depth to groundwater, and soil quality); (ii) health, gender and other social impacts; and (iii) public involvement (through input of local information by the WUAs and water supply committees). Additional consultants inputs of 2 person-months international and 4 person-months domestic, will reduce the risk of under-performance of environmental monitoring and evaluation.

20. It is recognized that it will be difficult to completely resolve the issues with respect to fisheries in the short term. However, as the precautionary principle states, “lack of full scientific certainty will not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” The IEE proposes to conduct further study on the fisheries issues. The completion of this study, which will become an integral part of the detailed design, with recommendations on appropriate mitigation measures, will become a precondition to start of any related construction activities. Consultants’ inputs will be provided to assist in planning and executing the required fisheries studies, and consequent measures to be adopted. Detailed terms of reference⁶, budget and an implementation schedule have been prepared.

21. For sustainability, the Project’s environmental monitoring program should be based on making maximum use of existing institutions and building on directly relevant initiatives such as those undertaken under the Agriculture Rehabilitation Project (ARP). The ARP is supporting the State Committee for Nature Protection and Forestry (SCNPF) with about \$100,000 to ensure regular monitoring of environmental impacts and mitigation measures. In addition, ADB has assisted the SCNPF with a 12-month institutional strengthening TA⁷ which included the supply of field monitoring equipment. The World Bank Rural Infrastructure Rehabilitation Project has supplied equipment and training to the central laboratory of MWRLR’s specialized Hydrogeological Amelioration Expedition for monitoring irrigation and drainage water quality.⁸

F. Public Consultation and Information Disclosure

22. A significant level of public consultation was undertaken during project preparation. Stakeholders at the central, regional, district, and project area levels were identified. Fieldwork for poverty and social analysis sought the opinion of stakeholders including the conduct of a large number of village- and farm-level interviews. A household survey was undertaken involving 200 respondents. Meetings were conducted with concerned government agencies at all administrative levels. Interviews were held with nongovernment organizations and farmers to collect data and identify local issues and priorities. A stakeholder workshop was held in Dushanbe in July 2004 to obtain feedback on the proposals in the interim report and assist final design. All consultations supported the project interventions, which match clear district-level priorities. The stakeholder workshop was followed by meetings with the SCNPF to elicit their comments on the IEE and to ensure that the Project followed the environmental regulations of Tajikistan. During project implementation, public participation will be channeled through the WUAs and water supply committees.

G. Findings and Conclusions

23. The Project will have significant positive environmental impacts, primarily through arrested land degradation that has been caused by salinity buildup and soil erosion in irrigated areas, and through providing rural water supply in the project areas—major environmental issues in Tajikistan. Findings show that the Project will have no significant adverse environmental impacts. Sufficient mitigation measures, and environmental management and monitoring integrated into project design and cost, will address the small impacts identified. A full-scale environmental impact assessment is not required.

⁶ The detailed terms of reference for consulting services is in Supplementary Appendix G.

⁷ ADB. 2000. *Technical Assistance to the Republic of Tajikistan for Capacity Building for Environmental Assessment and Monitoring Project*. Manila.

⁸ The IEE notes that regional soil and water or environmental laboratories will require some further upgrading and rationalization.

COST ESTIMATES AND FINANCING PLAN

Table A5.1. Project Components by Year, Including Contingencies
(\$'000)

| Item | Totals Including Contingencies | | | | | | Total |
|---|--------------------------------|----------------|-----------------|----------------|----------------|--------------|-----------------|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | |
| A. Rehabilitation of Irrigation & Drainage Infrastructure | | | | | | | |
| 1. Asht | 38.6 | 1,057.7 | 4,035.6 | 3,535.3 | 838.4 | 0.0 | 9,505.5 |
| 2. Vahdat | 145.9 | 268.8 | 687.2 | 341.6 | 0.0 | 0.0 | 1,443.5 |
| 3. Farkhor | 179.3 | 939.1 | 2,056.9 | 2,141.0 | 463.0 | 0.0 | 5,779.2 |
| 4. Panj | 130.5 | 688.4 | 1,637.0 | 1,349.2 | 163.9 | 0.0 | 3,969.0 |
| 5. Rushon | 59.9 | 145.6 | 217.5 | 216.5 | 116.1 | 0.0 | 755.7 |
| 6. Water Management Support | 64.6 | 9.8 | 4.9 | 4.9 | 4.8 | 0.0 | 89.0 |
| Subtotal Rehabilitation of Irrigation & Drainage Infrastructui | 618.7 | 3,109.3 | 8,639.2 | 7,588.4 | 1,586.2 | 0.0 | 21,541.9 |
| B. Support for Agricultural Development | 103.7 | 247.4 | 142.5 | 141.9 | 141.7 | 111.8 | 889.0 |
| C. Improvement of Potable Water Supply Systems | 34.8 | 542.3 | 1,157.5 | 675.4 | 100.2 | 0.0 | 2,510.3 |
| D. Project Management | 824.0 | 1,139.1 | 527.6 | 386.3 | 295.9 | 215.1 | 3,388.0 |
| Total Project Cost | 1,581.2 | 5,038.0 | 10,466.9 | 8,792.1 | 2,124.0 | 326.9 | 28,329.2 |

Sources: Asian Development Bank estimates.

Table A5.2. Components Project Cost Summary

| Components Project Cost Summary | (Local '000) | | | (\$ '000) | | | % | % Total |
|--|-----------------|-----------------|------------------|-----------------|-----------------|-----------------|------------------|------------|
| | Local | Foreign | Total | Local | Foreign | Total | Foreign Exchange | Base Costs |
| A. Rehabilitation of Irrigation & Drainage Infrastructure | | | | | | | | |
| 1. Asht | 13,162.5 | 15,537.0 | 28,699.6 | 4,387.5 | 5,179.0 | 9,566.5 | 54 | 34 |
| 2. Vahdat | 3,261.2 | 967.7 | 4,228.9 | 1,087.1 | 322.6 | 1,409.6 | 23 | 5 |
| 3. Farkhor | 10,125.5 | 7,026.7 | 17,152.2 | 3,375.2 | 2,342.2 | 5,717.4 | 41 | 20 |
| 4. Panj | 7,253.7 | 4,476.8 | 11,730.5 | 2,417.9 | 1,492.3 | 3,910.2 | 38 | 14 |
| 5. Rushon | 1,884.1 | 330.4 | 2,214.4 | 628.0 | 110.1 | 738.1 | 15 | 3 |
| 6. Water Management Support | 191.7 | 70.9 | 262.6 | 63.9 | 23.6 | 87.5 | 27 | 0.0 |
| Subtotal | 35,878.6 | 28,409.6 | 64,288.2 | 11,959.5 | 9,469.9 | 21,429.4 | 44 | 76 |
| B. Support for Agricultural Development | 2,314.5 | 286.8 | 2,601.3 | 771.5 | 95.6 | 867.1 | 11 | 3 |
| C. Improvement of Potable Water Supply Systems | 3,934.6 | 3,423.2 | 7,357.8 | 1,311.5 | 1,141.1 | 2,452.6 | 47 | 9 |
| D. Project Management | 4,413.1 | 5,471.0 | 9,884.1 | 1,471.0 | 1,823.7 | 3,294.7 | 55 | 12 |
| Total Baseline Costs | 46,540.8 | 37,590.6 | 84,131.4 | 15,513.6 | 12,530.2 | 28,043.8 | 45 | 100 |
| Physical Contingencies | 1,901.1 | 1,141.5 | 3,042.7 | 633.7 | 380.5 | 1,014.2 | 38 | 4 |
| Price Contingencies | 7,034.4 | 5,446.2 | 12,480.6 | (-405.4) | (-323.3) | (-728.8) | 44 | (-3) |
| Total Project Costs | 55,476.4 | 44,178.3 | 99,654.6 | 15,741.9 | 12,587.3 | 28,329.2 | 44 | 101 |
| Interest During Implementation | 0.0 | 2,362.1 | 2,362.1 | 0.0 | 685.2 | 685.2 | 100 | 2 |
| Total Costs to be Financed | 55,476.4 | 46,540.4 | 102,016.8 | 15,741.9 | 13,272.5 | 29,014.4 | 46 | 103 |

Source: Asian Development Bank estimates.

Table A5.3. Expenditure Accounts Project Cost Summary

| Item | (Local '000) | | | (US\$ '000) | | | % | % Total |
|---|-----------------|-----------------|------------------|-----------------|-----------------|-----------------|------------------|------------|
| | Local | Foreign | Total | Local | Foreign | Total | Foreign Exchange | Base Costs |
| I. Investment Costs | | | | | | | | |
| A. Civil Works | | | | | | | | |
| Off-farm Structures | 13,381.3 | 2,271.0 | 15,652.3 | 4,460.4 | 757.0 | 5,217.4 | 15 | 19 |
| Minor Civil Works and Buildings | 541.7 | 135.4 | 677.2 | 180.6 | 45.1 | 225.7 | 20 | 1 |
| Water Supply and Sanitation | 1,083.6 | 270.9 | 1,354.6 | 361.2 | 90.3 | 451.5 | 20 | 2 |
| Subtotal | 15,006.7 | 2,677.4 | 17,684.0 | 5,002.2 | 892.5 | 5,894.7 | 15 | 21 |
| B. Equipment | | | | | | | | |
| Office Equipment & Supplies | 192.6 | 192.6 | 385.3 | 64.2 | 64.2 | 128.4 | 50 | 0.0 |
| Pumps, Motors and Machinery | 9,287.3 | 16,510.8 | 25,798.2 | 3,095.8 | 5,503.6 | 8,599.4 | 64 | 31 |
| Pipes and Other Equipment | 10,203.7 | 9,459.4 | 19,663.1 | 3,401.2 | 3,153.1 | 6,554.4 | 48 | 23 |
| Electrical Equipment | 3,674.0 | 3,006.0 | 6,680.1 | 1,224.7 | 1,002.0 | 2,226.7 | 45 | 8 |
| Subtotal | 23,357.8 | 29,168.9 | 52,526.6 | 7,785.9 | 9,723.0 | 17,508.9 | 56 | 62 |
| C. Vehicles | 79.8 | 205.2 | 285.0 | 26.6 | 68.4 | 95.0 | 72 | 0.0 |
| D. Materials | | | | | | | | 0.0 |
| Office and Laboratory Materials | 153.6 | 115.0 | 268.7 | 51.2 | 38.3 | 89.6 | 43 | 0.0 |
| I&D Materials | 543.3 | 362.2 | 905.5 | 181.1 | 120.7 | 301.8 | 40 | 1 |
| Subtotal | 696.9 | 477.2 | 1,174.2 | 232.3 | 159.1 | 391.4 | 41 | 1 |
| E. Training, Extension & Studies | | | | | | | | |
| Training and Extension | 2,510.1 | 0.0 | 2,510.1 | 836.7 | 0.0 | 836.7 | 0.0 | 3 |
| Surveys and Studies | 1,056.0 | 0.0 | 1,056.0 | 352.0 | 0.0 | 352.0 | 0.0 | 1 |
| Water Committees | 33.9 | 0.0 | 33.9 | 11.3 | 0.0 | 11.3 | 0.0 | 0.0 |
| Subtotal | 3,600.0 | 0.0 | 3,600.0 | 1,200.0 | 0.0 | 1,200.0 | 0.0 | 4 |
| F. Consulting Services | | | | | | | | |
| International Consultants | 0.0 | 5,061.9 | 5,061.9 | 0.0 | 1,687.3 | 1,687.3 | 100 | 6 |
| National Consultants | 1,476.9 | 0.0 | 1,476.9 | 492.3 | 0.0 | 492.3 | 0.0 | 2 |
| Subtotal | 1,476.9 | 5,061.9 | 6,538.8 | 492.3 | 1,687.3 | 2,179.6 | 77 | 8 |
| G. Project Operations | | | | | | | | |
| Office and Staff Costs | 754.7 | 0.0 | 754.7 | 251.6 | 0.0 | 251.6 | 0.0 | 1 |
| PMO and RO Costs | 1,568.0 | 0.0 | 1,568.0 | 522.7 | 0.0 | 522.7 | 0.0 | 2 |
| Subtotal | 2,322.7 | 0.0 | 2,322.7 | 774.2 | 0.0 | 774.2 | 0.0 | 3 |
| Total Baseline Costs | 46,540.8 | 37,590.6 | 84,131.4 | 15,513.6 | 12,530.2 | 28,043.8 | 45 | 100 |
| II. Contingencies | | | | | | | | |
| A. Physical Contingencies | 1,901.1 | 1,141.5 | 3,042.7 | 633.7 | 380.5 | 1,014.2 | 38 | 4 |
| B. Price Contingencies | 7,034.4 | 5,446.2 | 12,480.6 | (-405.4) | (-323.38) | (-728.81) | 44 | (-3) |
| Total Project Costs | 55,476.4 | 44,178.3 | 99,654.6 | 15,741.9 | 12,587.3 | 28,329.2 | 44 | 101 |
| Interest During Implementation | - | 2,362.1 | 2,362.1 | 0.0 | 685.2 | 685.2 | 100 | 2 |
| Total Costs to be Financed | 55,476.4 | 46,540.4 | 102,016.8 | 15,741.9 | 13,272.5 | 29,014.4 | 46 | 103 |

I&D = irrigation and rehabilitation, PMO = project management office, RO = regional office

Source: Asian Development Bank estimates.

Table A5.4. Expenditure Accounts by Components, Including Contingencies
(\$'000)

| Investment Costs | Rehabilitation, Irrigation and Drainage Infrastructure | | | | | Improvement of Potable | | | | Total |
|---|--|----------------|----------------|----------------|--------------|--------------------------|--------------------------------------|----------------------|--------------------|-----------------|
| | Asht | Vahdat | Farkhor | Panj | Rushon | Water Management Support | Support for Agricultural Development | Water Supply Systems | Project Management | |
| A. Civil Works | | | | | | | | | | |
| Off-farm Structures | 780.0 | 1,046.0 | 1,480.8 | 1,310.4 | 724.4 | 0.0 | 0.0 | 0.0 | 0.0 | 5,341.7 |
| Minor Civil Works and Buildings | 103.8 | 0.0 | 78.5 | 48.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 230.7 |
| Water Supply and Sanitation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 462.0 | 0.0 | 462.0 |
| Subtotal Civil Works | 883.8 | 1,046.0 | 1,559.3 | 1,358.8 | 724.4 | 0.0 | 0.0 | 462.0 | 0.0 | 6,034.5 |
| B. Equipment | | | | | | | | | | |
| Office Equipment and Supplies | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 44.1 | 0.0 | 89.4 | 133.5 |
| Pumps, Motors and Machinery | 5,738.0 | 0.0 | 1,630.9 | 899.0 | 0.0 | 0.0 | 0.0 | 150.1 | 0.0 | 8,418.0 |
| Pipes and Other Equipment | 1,855.6 | 7.7 | 1,630.8 | 1,390.6 | 0.0 | 54.7 | 101.1 | 1,661.3 | 0.0 | 6,701.8 |
| Electrical Equipment | 996.8 | - | 911.3 | 277.9 | 0.0 | 0.0 | 0.0 | 90.2 | 0.0 | 2,276.2 |
| Subtotal Equipment | 8,590.5 | 7.7 | 4,173.0 | 2,567.6 | 0.0 | 54.7 | 145.1 | 1,901.6 | 89.4 | 17,529.6 |
| C. Vehicles | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.2 | 0.0 | 93.7 | 98.9 |
| D. Materials | | | | | | | | | | |
| Office and Laboratory Materials | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.4 | 73.3 | 91.7 |
| I&D Materials | 0.0 | 297.5 | 0.0 | 11.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 309.0 |
| Subtotal Materials | 0.0 | 297.5 | 0.0 | 11.5 | 0.0 | 0.0 | 0.0 | 18.4 | 73.3 | 400.7 |
| E. Training, Extension and Studies | | | | | | | | | | |
| Training and Extension | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 34.3 | 701.1 | 47.9 | 71.8 | 855.2 |
| Surveys and Studies | 31.2 | 92.2 | 46.8 | 31.2 | 31.2 | 0.0 | 0.0 | 68.8 | 61.5 | 363.1 |
| Water Committees | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.6 | 0.0 | 11.6 |
| Subtotal Training, Extension & Studies | 31.2 | 92.2 | 46.8 | 31.2 | 31.2 | 34.3 | 701.1 | 128.3 | 133.4 | 1,229.8 |
| F. Consulting Services | | | | | | | | | | |
| International Consultants | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1,737.0 | 1,737.0 |
| National Consultants | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 504.5 | 504.5 |
| Subtotal Consulting Services | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2,241.5 | 2,241.5 |
| G. Project Operations | | | | | | | | | | |
| Office and Staff Costs | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 258.8 | 258.8 |
| PMO and RO Costs | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37.5 | 0.0 | 497.9 | 535.4 |
| Subtotal Project Operations | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37.5 | 0.0 | 756.7 | 794.2 |
| Total Project Cost | 9,505.5 | 1,443.5 | 5,779.2 | 3,969.0 | 755.7 | 89.0 | 889.0 | 2,510.3 | 3,388.0 | 28,329.2 |
| Taxes | 1,819.4 | 224.3 | 939.5 | 639.2 | 90.2 | 10.4 | 32.6 | 469.4 | 54.1 | 4,279.2 |
| Foreign Exchange | 5,118.3 | 330.4 | 2,350.7 | 1,506.1 | 112.7 | 24.6 | 98.7 | 1,167.4 | 1,878.5 | 12,587.3 |

I&D = irrigation and rehabilitation, PMO = Project Management Office, RO = Regional Office
Source: Asian Development Bank estimates.

INDICATIVE CONTRACT PACKAGES

| Component/Package | Tentative Value (\$) | Mode of Procurement ^a |
|---|----------------------|----------------------------------|
| A. Support for Agriculture Development Procurement of Equipment for Seed Production | 108,000 | IS |
| B. Rehabilitation of Irrigation and Drainage Infrastructure | | |
| 1. Rehabilitation of Canal Headworks, and Pumping Stations | | |
| a. Irrigation and Drainage Infrastructure in Asht District | | |
| i. Delivery/Installation/Rehabilitation of ANS-1,2 and 3B Pumping Stations | 5,700,000 | ICB |
| ii. Delivery, Installation and Testing of Pressure Delivery Pipes for ANS-1, 2 and 3B Pumping Stations | 2,000,000 | ICB |
| iii. Intake Channel to ANS-1 Pump Station, Headworks and Forebay | 275,000 | LCB |
| iv. Rehabilitation of Off-Farm Irrigation Infrastructure and Construction of Pangaz-Say Headworks | 5,000,000 | LCB |
| b. Irrigation and Drainage Infrastructure in Farkhor District | | |
| i. Delivery/Installation/Rehabilitation of Urtaboz-1, 3, 4 and 4a Pumping Stations | 2,600,000 | ICB |
| ii. Delivery, Installation and Testing of Pressure Delivery Pipes for Urtaboz-1, 3, 4 and 4A Pumping Stations | 1,600,000 | ICB |
| iii. Construction of a Sedimentation Basin including Structures at Chubek Headworks | 960,000 | ICB |
| iv. Rehabilitation of Off-Farm Irrigation and Drainage Infrastructure | 510,000 | LCB |
| c. Irrigation and Drainage Infrastructure in Panj District | | |
| i. Delivery/Installation/Rehabilitation of Fayzabadqala-0 and 1 Pumping Stations | 1,170,000 | ICB |
| ii. Delivery, Installation and Testing of Pressure Delivery Pipes for Fayzabadqala 0 and 1 Pumping Stations | 1,390,000 | ICB |
| iii. Rehabilitation of Halqoyar Intake Canal and Construction of Sedimentation Basin | 429,000 | LCB |
| iv. Rehabilitation of Off-Farm and Drainage Infrastructure | 880,000 | LCB |
| d. Irrigation and Drainage Infrastructure in Rushon District | | |
| i. Rehabilitation of Off-farm Irrigation Canals and Structures | 530,000 | LCB |
| ii. Minor Work and Sediment Removal | 193,000 | LCB |
| e. Irrigation and Drainage Infrastructure in Vahdat District | | |
| i. Rehabilitation of Rohati Main Canal, Headworks, and Structure Protection | 440,000 | LCB |
| ii. Replacement of Siphon on Rohati Main Canal | 696,000 | LCB |
| iii. Rehabilitation of Dashtibed Canal Headworks and Protection Works | 214,000 | LCB |
| 2. Support to Water Management Agencies | | |
| a. Operation and Maintenance Machinery Procurement of O&M Machinery for desilting of sediment basins | 817,000 | ICB |
| b. WUA Support | | |
| i. Equipment for WUA Support Unit (MWRLR, Field Offices) | 129,000 | IS |
| ii. Procurement of Water Management Equipment | 25,000 | DP |
| C. Improvement of Potable Water Supply Systems | | |
| 1. Delivery/Installation of Water Supply Pipes and Rehabilitation of Water Supply (Shaydon Village in Asht District) | 556,000 | LCB |
| 2. Delivery/Installation of Water Supply Equipment and Rehabilitation of Water Supply Supply Infrastructure (Suhan Village in Farkhor District) | 338,000 | LCB |
| 3. Delivery/Installation of Water Supply Pipes, Equipment and Rehabilitation of Water Water Supply Infrastructure (Somon Farm Villages in Panj District) | 907,900 | LCB |
| 4. Delivery/Installation of Water Supply Pipes and Rehabilitation of Water Supply Supply Infrastructure (Rushan Villages in Rushon District) | 273,000 | LCB |
| 5. Drilling of Boreholes, Delivery and Installation of Hand pumps (Simiganj Jamoat in Vahdat District) | 288,000 | LCB |
| D. Support to PMO Procurement of Environment Monitoring Equipment and Furniture | 25,000 | DP |

^a DP = direct purchase, ICB = international competitive bidding, IS = international shopping, LCB = local competitive bidding

Source: Asian Development Bank estimates.

TECHNICAL ASSISTANCE FOR SUPPORT FOR MONITORING POLICY REFORMS AND IMPROVING FARM AND WATER MANAGEMENT

A. Objectives and Scope

1. The objectives of the technical assistance (TA) are to (i) monitor progress made by the Government in implementing policy reforms that would create a conducive environment for project implementation; (ii) promote competitive providers of farm inputs, technical advice, credit, and marketing of products in the selected project areas; and (iii) assist the Government in establishing a water users' association (WUA) support unit within the Ministry of Water Resources and Land Reclamation (MWRLR).

2. The TA will provide regular monitoring and reporting on progress being made by the Government toward its commitments to meeting safeguards listed in the Loan Agreement, and also provide an independent monitor of contract award and implementation. The TA for the alternative business providers will focus on (i) analyzing the strengths and limitations of existing business providers beyond the services offered by the traditional investors;¹ and (ii) providing capacity building for selected provider(s) to expand their services to private farmers in the project areas. The TA support for the WUAs support unit will focus on (i) defining the unit's mandate, organizational structure, functions, staffing pattern, and legal status; (ii) the development of guidelines for WUA formation and support within the country; and (iii) providing institutional strengthening to ensure that the support unit can properly operate in a sustainable manner.

3. The TA is divided into two phases: the preparation and the capacity-building phases. The outcome is that the farmers in the project areas will receive better service from providers of irrigation and drainage, and be more able to manage their own farms effectively.

B. Consultants

4. The TA will require a total input of 12 person-months of international and 37 person-months of domestic consultants. The following breakdown of the consultants is indicative and subject to revision at consultant selection stage, allowing one specialist to cater for more than one position (person-months are given in parentheses). The international consultant inputs will include an agricultural economist/team leader (7), an irrigation institutions specialist (3), and a small business development/credit specialist (2). The domestic consultancy inputs will comprise a legal specialist (3), a WUA specialist (6), an irrigation specialist (4), a financial management/credit specialist (6), an agricultural economist (3), a monitoring and evaluation specialist (12), and a public awareness specialist (3).

5. Asian Development Bank (ADB) will engage, through a suitably qualified firm, international consultants with domestic associates, to provide services in accordance with the terms of reference following the *Guidelines on the Use of Consultants* and other arrangements satisfactory to ADB for the engagement of domestic consultants.² The consultants will be required to work closely with MWRLR and other key stakeholders. The other government institutions that might participate in TA implementation include the National Bank of Tajikistan, Ministry of Agriculture, Ministry of Economics and Trade, and Ministry of Justice. The

¹ Traditional investors are local traders/exporters who provide seasonal credit, mostly in kind, to farmers using farming products, mainly cotton, as collateral.

² Simplified technical proposals and ADB's quality- and cost-based selection system will be used for the selection of consultants.

consultants will also interact with the ADB-financed Agricultural Rehabilitation Project, and relevant ongoing projects of other international agencies. Intensive consultations should also be conducted with civil society organizations such as the Cooperative for Assistance and Relief Everywhere (CARE) International, Agence d'Aide à la Coopération Technique et au Développement (ACTED), Aga Khan Foundation, and private sector organizations, such as Tojiksogirot Bank, First Microfinance Bank, farmers, WUAs, and traders.

C. Description of Tasks

1. Phase I: Needs Assessment, Analysis, and Preparatory Activities

a. Selection of Alternative Business Providers

6. The consultants will undertake the following tasks:

- (i) Assess marketing channels and value added chains of key farming inputs and products, and assess the input delivery systems in the project areas;
- (ii) Examine margins gained by each chain and channel between the farm gate in the project areas and the main producers or buyers;
- (iii) Assess the marketing mechanisms for key farming inputs and products, and evaluate the available banking and nonbanking agricultural financial services in the project areas;
- (iv) Assess the impact of legal, administrative, and other factors that might limit development of a free market in provision of farmer support services, and identify how these restrictions might be overcome;
- (v) Examine the current investor services in the project areas such as the provision of credit (farm debts), technical advice, inputs (fertilizers, pesticides, fuel, seeds, etc.) and marketing; assess the strengths and limitations of the potential alternative providers; and identify constraints to the development of competitive business structures in the project areas;
- (vi) Develop ranking and selection criteria and, in consultation with project stakeholders, rank the alternative providers of services to farmers in each area to identify the best project partners for developing agricultural business services in the project areas; and
- (vii) In consultation with farmers and business providers, develop a detailed implementation plan for providing technical support to assist the establishment of alternative marketing structures in the core demonstration areas.

b. Establishment of Water Users' Association Support Unit at Ministry of Water Resources and Land Reclamation

7. The consultants will carry out the following tasks:

- (i) Assess the existing structures within MWRLR that are working with WUAs, and study alternatives for establishing either a new WUA support unit, or for restructuring existing divisions to support WUAs development and operation;
- (ii) Assess the scope, structure, and functions of WUAs established by other projects and financiers, and their linkages to MWRLR;
- (iii) Develop (following consultation with MWRLR, other development partners and projects) appropriate definitions of WUA structure, responsibilities, and methods of operating for adoption throughout Tajikistan;

- (iv) Develop a proposal for organizational arrangements for the WUA support unit including its objectives, legal status, mandate, functions, organizational structure, staffing, job descriptions of key staff, etc.—including arrangements for field units such as those to be supported under Irrigation Rehabilitation Project (IRP)
- (v) Assess capacity-building and training needs and other support required by the WUA support unit to develop viable and sustainable WUAs in Tajikistan;
- (vi) Prepare guidelines, operation manual(s), and a financial plan, and assess the resources required for the day-to-day operation of the support unit;
- (vii) Develop a detailed implementation plan for the establishment of the support unit as a viable part of MWRLR; and
- (viii) Organize a workshop at the end of Phase I to disseminate the TA recommendations and proposed actions to be completed before the commencement of Phase II.

8. The recommendations and proposed plans of action resulting from Phase I will be disseminated to MWRLR, other concerned government agencies, and stakeholders for consideration and action prior to the commencement of Phase II.

2. Phase II: Capacity Building

a. Monitoring of Reforms and Information Dissemination

9. The consultants will carry out the following tasks:

- (i) Establish a system for the monitoring and evaluation of policy reforms in the core demonstration areas that involves participatory consultation with key stakeholders, including civil society and elected representatives, and that can be applied during and after completion of the TA; and examine the potential for responsibility for the monitoring process to be taken over by selected NGOs or other agencies after completion of the TA;
- (ii) Monitor the progress of implementation of policy reforms in the project areas, as agreed by the Government, and their impact on farm productivity and profitability, the cost and availability of inputs, output prices, farmers' incentives, etc. In particular the TA will monitor progress in (a) the termination of the involvement of local authorities in farm operations, management and marketing, and the removal of remaining constraints to the free marketing and ginning of cotton; (b) the implementation of measures to improve conditions for the supply of agricultural services and inputs to farmers by the private sector; (c) the implementation of land reform, the issuance of land certificates and the passing of legislation so that land certificates can be used as collateral; and (d) steps taken to resolve the issue of farm debt;
- (iii) Provide feedback on compliance with other policy reform agreements with various bilateral and multilateral agencies, specifically the World Bank and the International Monetary Fund (IMF);
- (iv) Establish a procedure for gathering feedback from stakeholders regarding any corruption in the award and execution of contracts under the project loan. This feedback will promote transparency in contract award procedures, and will serve as an independent check on the satisfactory implementation of the contracts;
- (v) Carry out awareness campaigns, including development and dissemination materials (e.g., brochures, posters) for the services offered by the WUA support

- unit and alternative business providers. Disseminate information to farmers in the project areas through consultations, group meetings, and mass media; and
- (vi) Organize a workshop at the end of the Phase II to disseminate the TA recommendations and proposed actions, and assess and analyze implementation of policy reforms in the area.

b. Capacity Building for Selected Business Providers

10. The consultants will carry out the following tasks:

- (i) Provide TA and support to the selected business providers in developing competitive market structures in the project core demonstration areas;
- (ii) Develop sample transparent financial agreements for provision of farm inputs and products;
- (iii) Support the selected business providers to introduce internationally recognized investment and lending practices in the core demonstration areas;
- (iv) Propose appropriate systems for investment monitoring in the core demonstration areas; and
- (v) Formulate recommendations concerning how agricultural business provision could be extended to the project areas.

c. Capacity Building for the Water Users' Association Support Unit

11. Phase II of the TA will commence after staff have been recruited to the WUA support unit. The consultants will carry out the following tasks:

- (i) Provide support services required to make the unit operational;
- (ii) Train WUA support unit staff as identified during the needs assessment;
- (iii) Develop use of the operational guidelines and practices for the establishment of WUAs prepared in Phase I through forming WUAs in the Irrigation Rehabilitation Project pilot areas. Identify any ways in which the procedures may be improved and develop an effective mechanism for collection of water fees;
- (iv) Develop, in consultation with the key stakeholders and as a result of experience gained in the pilot area, a program for the replication of WUAs within the project areas and the improvement of on-farm water management; and
- (v) Finalize recommendations on the responsibilities and operational procedures of the WUA support unit.

D. Implementation Arrangements

12. The Executing Agency for the TA will be MWRLR. The TA will be guided and monitored by the project steering committee already established under the loan project. MWRLR will provide counterpart staff and facilities to work with the TA consultants.

E. Technical Assistance Schedule and Reporting

13. The TA will be implemented over a period of 24 months, starting in early 2006. The duration of Phase I will be 6 months, and of Phase II 12 months. It is anticipated that there will be a period of up to 6 months between the two phases, to allow sufficient time to MWRLR to recruit staff and prepare legal documents. The consultants will submit to MWRLR and ADB two inception reports: each month after starting work on a phase of the project. The consultants will

also submit a final report for Phase I, a midterm report on progress made in month 7 of Phase II, a comprehensive draft final report at the end of the 10th month of Phase II, and a final report by the end of TA implementation. Each report will include a report on the Government's progress toward meeting loan safeguards.

F. Estimated Costs

14. The total cost of the TA is estimated at \$625,000 equivalent, of which \$500,000 equivalent will be financed on a grant basis by ADB's TA funding program. The Government through in-kind contributions will finance the remaining \$125,000 equivalent. The estimated breakdown of the costs is given in Table A8.1. Additional financing/contributions from the selected business providers, farmers, and other stakeholders will be sought during TA implementation.

Table A8.1: Cost Estimates and Financing Plan
(\$ '000)

| Item | Foreign Exchange | Local Currency | Total Cost |
|--|------------------|----------------|----------------|
| A. Asian Development Bank Financing^a | | | |
| 1. Consultants | | | |
| a. Remuneration and Per Diem | | | |
| i. International Consultants | 216,000 | 0 | 216,000 |
| ii. Domestic Consultants | 0 | 37,000 | 37,000 |
| b. International and Local Travel | 25,000 | 5,000 | 30,000 |
| c. Reports and Communications | 6,000 | 4,000 | 10,000 |
| 2. Equipment and Supplies ^b | 25,000 | 45,000 | 70,000 |
| 3. Workshops/Seminars | 15,000 | 35,000 | 50,000 |
| 4. Interpreters and Translators | 12,000 | 0 | 12,000 |
| 5. Land Transport and Administrative Support | 6,000 | 4,000 | 10,000 |
| 6. Representative for Contract Negotiations | 5,000 | 0 | 5,000 |
| 7. Contingencies | 50,000 | 10,000 | 60,000 |
| Subtotal (A) | 360,000 | 140,000 | 500,000 |
| B. Government Financing | | | |
| 1. Office Accommodation | 0 | 12,000 | 12,000 |
| 2. Remuneration of Counterpart Staff | 0 | 60,000 | 60,000 |
| 3. Travel and Per Diem of Counterpart Staff | 0 | 12,000 | 12,000 |
| 4. Survey and Data | 0 | 15,000 | 15,000 |
| 5. Workshops and Seminars | 0 | 6,000 | 6,000 |
| 6. Logistical Support | 0 | 7,500 | 7,500 |
| 7. Contingencies | 0 | 12,500 | 12,500 |
| Subtotal (B) | 0 | 125,000 | 125,000 |
| Total | 360,000 | 265,000 | 625,000 |

^a Financed on a grant basis by ADB's TA funding program.

^b Including computers, printers, office communication equipment, and basic office furniture for the WUA support unit in MWRLR, WUAs in the five core demonstration areas, and TA consultants.

Source: Asian Development Bank estimates.

Table A8.2: Preliminary Technical Assistance Framework

| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions and Risks |
|---|--|---|--|
| <p>1. Goal</p> <p>Support implementation of conducive policies to support public and private investment in agriculture and agricultural services in Tajikistan</p> | <p>Five years after project completion:</p> <p>Conducive policies are in place, adequately implemented and monitored.</p> <p>Agricultural public and private investment in rural areas have increased by 20%.</p> | <p>Project performance reports (PPRs)</p> <p>National and regional statistics</p> | <p>Stability of political, economic, and security conditions in the country provides a secure environment for investment</p> |
| <p>2. Purpose</p> <p>Assist the Government in:</p> <ul style="list-style-type: none"> - monitoring the progress of policy reforms - promoting competitive providers of farm inputs, technical advice, credit, and marketing of products in the selected project areas - establishing a water users' association (WUA) support unit within the Ministry of Water Resources and Land Reclamation (MWRLR) | <p>By the end of the Project:</p> <p>A consultative monitoring mechanism for policy reform implementation is in place and applied by the Government</p> <p>Private sector providers of agricultural services identified in each project areas and provided with technical support an training</p> <p>WUA support unit within MWRLR established</p> <p>WUAs established and operating in project pilot areas.</p> | <p>Project monitoring and evaluation report</p> <p>PPR</p> | <p>Policies on water and agriculture promote financially viable farming</p> <p>Government implements policies to remove constraints to private sector participation</p> <p>WUA support unit is adequately financed by the Government</p> |

Note: The TA framework, including outputs, specific activities, and required inputs, will be further developed during implementation of the TA.

ECONOMIC AND FINANCIAL ANALYSES

A. Introduction

1. Economic and financial analyses were carried out to justify the economic viability of the Project and the financial viability of farms. In general, comparisons of costs and benefits in the analysis of projects are made on the basis of quantifiable physical inputs and outputs. Incremental net benefits are estimated, where possible, on the basis of the changes expected to occur and other conditions expected to prevail within targeted geographic areas (i) in the absence of the proposed Project's interventions, and (ii) as a consequence of implementing the proposed interventions. For the economic analysis, these quantifiable inputs and outputs are valued according to their border price equivalents. For the financial analysis, established prices are applied as determined by local markets.
2. The principal objective of the economic analysis is to establish whether proposed investments are profitable for the economy as a whole, determined when the net present value (NPV) of costs and benefits are positive when discounted at the opportunity cost of capital.
3. The project has four principal components, which are: (i) rehabilitation of irrigation and drainage infrastructure, (ii) support for agricultural development, (iii) improvement of potable water supply systems, and (iv) project management.
4. The Rehabilitation of Irrigation and Drainage Infrastructure component includes rehabilitation of both pump stations and of headworks, canal structures, and other civil works. Within the component there are five subcomponents for the districts of Asht, Vahdat, Farkhor, Panj, and Rushon. Each district subcomponent has been assessed separately and then combined to give an assessment for the whole project. The costs of the Support for Agricultural Development are prorated for the overall project options according to the investment in irrigation and drainage in each district. The costs of Project Management are split evenly among the five subcomponents.
5. Economic analysis for the Improvement of Potable Water Supply Systems has been carried out separately using the time-savings method recently developed by the Economics and Research Department of the Asian Development Bank (ADB) for the analysis of rural water supply systems. This method compares time savings with the annualized capital costs and operation and maintenance (O&M) costs of each system to determine whether the minimum requirement of positive NPV at the opportunity cost of capital is met. It does not calculate actual NPV or economic internal rate of return (EIRR). All five water supply schemes have results consistent with EIRR greater than 12%. The costs and benefits of this component are not included in the assessment of the overall Project.

B. Areas, Cropping Pattern, and Yields

6. The total project area, in the five districts, is 47,500 hectares (ha) of irrigated land, with an estimated 262,000 beneficiaries. The two major crops, cotton and wheat, are planted on about 50% and 21% of the area. The remaining area is planted with fruit, vegetables, and fodder. Orchards are particularly important in Asht district and in the upper part of the Asht-1 cascade are the dominant crop, occupying about 75% of the area. Present average yields vary among the districts, from 1.2 tons (t)/ha for cotton in Asht to 2.0 t/ha in Panj. For wheat, average yields vary from 1.6 t/ha in Asht to 3.1 t/ha in Farkhor.

7. The quality of seed available to farmers, especially for the major crops, is generally of a low standard with the result that yields are lower than could be achieved if seed of higher performing varieties were more widely available. Increasing the supply of higher quality seed can have significant benefits for farmers. Crop pests and diseases are also widespread, with similar negative impacts on crop output.

8. Double cropping is not widespread in Tajikistan, although there is some scope for it in locations where a short cycle vegetable or fodder crop can follow wheat or an early vegetable crop. The potential and practical possibilities for intensifying and diversifying crop production will be demonstrated in the crop production program in the core demonstration areas. Gradual adoption of these methods, supported by expanding domestic markets as the economy grows, will lead to an increase in cropping intensity.

C. Major Assumptions

9. Economic and financial prices for traded goods (wheat and cotton and nitrogen, phosphorous and potassium fertilizers) are derived from World Bank commodity price projections for the years up to 2015. Prices are adjusted to 2004 constant prices using the manufacturing unit values index and are adjusted for insurance, freight, and handling to derive border prices. The border prices are adjusted by the shadow exchange rate factor and by deductions for local transport, storage, handling, and processing costs (where appropriate) to obtain estimated farm-gate prices and are converted to somoni at the official exchange rate.

10. Prices for nontraded agricultural inputs and outputs are based on 2004 prices in the project districts. A combination of official sources, data from farms in each district and market prices, adjusted to allow for transport and traders' margins, have been used. Machinery costs have been based on current data from farms in each district for the principal mechanized activities. Taxes on land and wages have been applied at the current rates in the financial analysis of farm budgets.

11. Daily wage rates for each district have been calculated based on data from farms in each district. This data generally implies different daily rates for each crop, but in order to simplify the analysis, a single average rate has been estimated and applied for each district. These rates vary from TJS1.00 per day in Rushon to TJS1.50 per day in Asht and Vahdat.

12. The cost of pumping water to farms in the Asht and Farkhor pump irrigation areas is directly proportional to the cost of electricity. The financial price used in the analysis is TJS 0.012/kilowatt-hour (kWh) which is the current price applying for the water sector. The economic price adopted for this project is the long-run marginal cost of electricity of \$0.021/kWh (TJS 0.063/kWh).¹

13. The analysis is in 2004 constant prices. An exchange rate of \$1= TJS3.00 has been used, the discount rate is 12%, and the project life is 25 years. The shadow exchange rate factor is 1.11, which is the value generally accepted for use in Tajikistan and is consistent with the general level of tariffs in force and with other factors affecting domestic prices. Domestic and nontraded goods are valued at their local market rates. The shadow wage rate factor for rural labor is 0.80, which reflects the high levels of unemployment and underemployment currently found in rural areas of Tajikistan.

¹ World Bank. 2004. *Tajikistan: Energy Utility Reform Review – A Strategic Approach to Sector Development* Washington, D.C.

D. Benefits

14. Agricultural production will be the principal source of benefits for the Project. The level of benefits accruing varies among the districts, with the main differences occurring between pump and gravity-fed areas:

- (i) with rehabilitation of pump stations, the water supply to farms will be assured and the risk of supply failure reduced or eliminated; the security of supply will reduce the potential for stress during critical growth periods and encourage farmers to increase investment in production;
- (ii) without rehabilitation, the pump stations would continue in operation for some time—perhaps 10 years or more—but would experience a gradual decline in efficiency and in the volumes of water supplied to the canals as they age further;
- (iii) rehabilitation of headworks, canals, and canal structures in areas supplied by gravity will also improve the reliability and timeliness of supply and will reduce the risk of stress at critical periods of plant growth; and
- (iv) without rehabilitation of these structures, the supply of water to farms will gradually be less reliable and the volumes supplied may decline. In gravity-fed areas, the decline will be less than in pump irrigation areas and the risk of total failure of supply is minimal.

15. The Project supports the expansion of the supply of high quality seed available to farmers and will introduce a training program in integrated pest management. Both of these programs will have a positive impact on crop yields and agricultural production.

16. Rehabilitation of the pumping cascades results in energy savings in Asht and Farkhor districts. Significant energy saving benefits also arise from the conversion of the upper parts of the Asht-1 cascade to gravity supply through the diversion of the Pongaz-Say river.

E. Economic Internal Rate of Return

17. The EIRR for the Project is 20.7% with an NPV of \$9.9 million. The EIRR and NPV for the district subprojects are shown in Table A9.1. All the district subprojects have acceptable EIRRs well above 12%.

Table A9.1: Net Present Value and Economic Internal Rate of Return

| Subproject | NPV (\$'000) | EIRR (%) |
|----------------------|--------------|-------------|
| Asht | 1,324 | 16.2 |
| Farkhor | 5,254 | 26.1 |
| Panj | 1,779 | 19.3 |
| Rushon | 117 | 13.5 |
| Vahdat | 1,407 | 23.3 |
| Project Total | 9,880 | 20.7 |

Source: Asian Development Bank estimates.

F. Sensitivity Analysis

18. The results of the sensitivity analysis for the Project are shown in Table A9.2. As well as testing the results for variations in input and output prices, the effects on EIRR of key assumptions have also been tested.

Table A9.2: Sensitivity Analysis

| Scenario | NPV (\$'000) | EIRR (%) |
|-----------------------------------|--------------|----------|
| Base | 9,880 | 20.7 |
| 1. Input prices +10% | 8,501 | 19.6 |
| 2. Output prices - 10% | 5,675 | 17.2 |
| 3. Project costs +10% | 7,649 | 18.2 |
| 4. With project yields -10% | 7,298 | 18.6 |
| 5. Delay in benefits 2 years | 3,212 | 14.3 |
| 6. Costs +10%, Output prices -10% | 3,444 | 14.9 |
| 7. Costs -10%, Output prices +10% | 16,317 | 27.1 |

Source: Asian Development Bank estimates.

19. The economic results for the Project are robust to negative changes in key variables. The combination of cost overruns and a fall in all output prices would reduce the project outcome, but would have to be severe to threaten viability. Delays in project implementation and consequent delays in achieving benefits would be the most likely source of a threat to the Project's overall economic viability.

G. Financial Analysis: Farm Budgets

20. Based on the models developed to assess the project, farm budgets were estimated for large farms, *dekhan* farms, and household plots, for each district. These allow the impact of the Project on the different types of farms to be evaluated. There are still many large farms operating in these districts, but the Government is committed to phasing them out within several years and replacing them with individual *dekhan* farms. The expected impact of the Project on *dekhan* farms and household plots is therefore important.

21. As shown in Table A9.3, the *dekhan* farms all show increases in income with the Project, with the largest proportional increases in Asht where current yields for cotton and wheat are low compared with other districts. The smallest expected increases in *dekhan* farm income are in the gravity-fed parts of the Farkhor system, but these and other gravity-fed areas are less vulnerable than the pump irrigation areas to fall in income without the Project.

22. The Project will also have a positive impact on production from household plots in all areas, with the increase after 7 years ranging from 20% in the Farkhor gravity-fed areas to around 30% in the pump irrigation areas of Asht and Farkhor because of the expected greater impact of the Project on water supply in the pumped areas. These increases are important because many rural households depend upon the production of these plots to supplement food supplies and, to a lesser extent, household income as indicated in Table A9.4.

Table A9.3: Farm Net Income—*Dekhan* Farms
(TJS, 2004 constant prices)

| District | Area (ha) | Present | Future with Project | | Future without Project | |
|----------------------|-----------|---------|---------------------|---------|------------------------|----------|
| | | | Year 5 | Year 10 | Year 5 | Year 10 |
| Asht-1—upper area | 16.6 | 692 | 2,182 | 2,613 | 233 | -328 |
| Asht-1—lower area | 16.6 | (-124) | 2,676 | 2,844 | (-705) | (-1,899) |
| Vahdat | 5.0 | 2,171 | 3,032 | 3,241 | 2,394 | 2,376 |
| Farkhor—pump area | 69.0 | 20,959 | 31,257 | 37,138 | 17,091 | 9,937 |
| Farkhor—gravity area | 69.0 | 20,959 | 30,103 | 35,157 | 22,896 | 22,265 |
| Panj | 22.0 | 12,906 | 15,209 | 16,620 | 13,576 | 13,151 |
| Rushon | 44.0 | 28,074 | 37,324 | 41,356 | 26,948 | 25,080 |

ha = hectare.

Note: Pumping cost of water not included.

Source: Asian Development Bank estimates.

Table A9.4: Farm Net Income—Household Plots
(TJS, 2004 constant prices)

| District | Area (ha) | Present | Future with Project | | Future without Project | |
|----------------------|-----------|---------|---------------------|---------|------------------------|---------|
| | | | Year 5 | Year 10 | Year 5 | Year 10 |
| Asht-1—upper area | 0.18 | 133 | 172 | 188 | 116 | 96 |
| Asht-1—lower area | 0.18 | 119 | 158 | 181 | 99 | 81 |
| Vahdat | 0.13 | 185 | 221 | 243 | 185 | 185 |
| Farkhor—pump area | 0.09 | 83 | 111 | 133 | 68 | 51 |
| Farkhor—gravity area | 0.09 | 83 | 101 | 115 | 80 | 76 |
| Panj | 0.22 | 173 | 198 | 214 | 128 | 128 |
| Rushon | 0.05 | 128 | 159 | 176 | 117 | 108 |

ha = hectare.

Note: Pumping cost of water not included.

Source: Asian Development Bank estimates.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

| | | | |
|---|--|--|--|
| Is the sector identified as a national priority in country poverty analysis? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Is the sector identified as a national priority in country poverty partnership agreement? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Contribution of the sector or subsector to reduce poverty in Tajikistan: | | | |
| <p>Growth in Tajikistan's agriculture sector, and the cotton subsector in particular, would play a crucial role in poverty reduction. In 2002, the agriculture sector contributed 26% of the country's gross domestic product (GDP) and two thirds of its labor force (World Bank, 2004, <i>Tajikistan Poverty Assessment Update</i>, draft, page 19). The cotton subsector, which supported three fourths of the country's farm households and occupied the same share of its farmlands, accounted for 30% of Tajikistan's export revenues (<i>ibid</i>).</p> <p>Although there is no official definition of poverty line in the country, recent available statistics indicate that income poverty in Tajikistan is widespread and severe in the countryside, especially in the cotton-growing areas. If defined according to the State Statistical Agency (SSA) minimum food basket benchmark of Tajik Somoni 20 per person per month, the poverty incidence of the country in 1999 was 83%; this declined to 67% in 2003 (<i>ibid</i>, page 3). The World Bank study, which used a poverty threshold of \$2.15 per person per day, at 2000 purchasing power parity (PPP), also showed a decreasing (albeit high) trend—from 81% in 1999 down to 64% in 2003. Poverty was more prevalent in rural areas where 65% of its households were poor (using the \$2.15 per day poverty line definition), compared with 59% in the urban centers. Khatlon and Sughd regions, which produced 85% of the country's cotton and home to 65% of the country's population, accounted for 76% of the total poor households and 72% of the total extremely poor households (using \$1 per person per day at 2000 PPP). The rural poor consisted mainly of agricultural workers, especially on cotton farms, families with many children, the elderly, the sick and invalids, and women (especially female-headed households). Labor income remained the most important income source for all households (at 45% of total household income), followed by the imputed value of food produced at home and gifts of foodstuffs (24%) (<i>ibid</i>, Annex 1). Consumption expenses grew even for the poor households in 2003. As expected, the share of total household expenditure on food for the bottom 20% of the income decile was higher (71–73% of all expenditure on food) than the top 20% (62%). Interestingly, the share of the imputed consumption value of home food-produced to total food expenditures was much lower for all household incomes levels when compared with its share in 1999. More than half of food expenditures for all household income groups were purchased from the market. The major reason for the lower share of home food consumption was because food from the garden plots was becoming less sufficient to support a family due to declining productivity of these plots. While access to food from markets may have improved, the purchasing power especially of the bottom 20% was nevertheless still insufficient so that various coping mechanisms (like selling household assets, sending children to relatives, etc.) were employed. The most disturbing fact from a nutritional viewpoint was that more than half of the poorest households ate an average of one meal or less a day.</p> <p>While high and continued positive economic growth in the past years (averaging 8% per annum) particularly from the agriculture sector, has contributed to poverty reduction (as indicated by the poverty reduction elasticity of 1.08), the benefits to the rural poor were uneven. Khatlon and Sughd, which recorded the highest per capita GDP growth rates in 2003, had still the largest proportion of poor households. The major reason for the high GDP growth rates in the cotton-growing regions was the increase in the world price of cotton. For growth to have a more lasting impact on poverty in the cotton subsector, structural reforms would be required that would essentially improve the profitability of cotton farms.</p> <p>It should be stressed that poverty in Tajikistan is also nonincome based, characterized by a worsening human development situation due to lack of essential services, and increasing economic and social disparities that particularly affect women. A key element of nonincome-based poverty is the lack of clean drinking water in rural Tajikistan. The Poverty Reduction Strategy Paper (PRSP) of 2003 reported that only 40% of Tajikistan's population used piped water at home or outdoors. Limited access to potable water has a tremendous impact on poverty, including work-days lost due to illness and time spent transporting water from long distances.</p> | | | |
| B. Poverty Analysis | | Targeting Classification: Targeted Intervention | |
| <p>Though poverty statistics countrywide indicate that the incidence of poverty is decreasing, most villagers in the Project's cotton-growing areas think otherwise. During stakeholder meetings, villagers who participated in the self-rating poverty assessments said that the income structure has not changed and that poor households in their villages constitute approximately 75% of all households, middle about 15%, and rich 10%. Local villagers typically described the poor or vulnerable groups as agricultural workers, <i>dekhan</i> farmers working for collective <i>dekhan</i> farms or joint stock farms, government workers on a salary, households without garden plots or livestock, single women, households containing multiple families under one roof, pensioners, and invalids. Villagers identified the rich in their villages as independent</p> | | | |

dekhan farmers, people who had developed an asset base during the Soviet period (and still maintained that asset base), and those who knew how to operate in a market economy.

At the five project sites, three general themes emerged as a cause of poverty—lack of water for irrigation and drinking, lack of access to land, and lack of jobs. Villagers saw physical improvements in their irrigation systems as a potential avenue to escape extreme poverty, if the improvements led directly to more reliable and assured irrigation water supplies for both large cotton fields and also smaller household gardens. Villagers also consistently commented on the need for more opportunities to become independent *dekhan* farmers, in control of their agricultural inputs and outputs, rather than dependent on collective *dekhan* farms and outside investors. Village women in particular often stated that they have skills (e.g., baking, weaving) but they have no "job place" to demonstrate those skills and earn an income.

The design of the Project addresses the key causes of income poverty. Low productivity and hence low incomes from cotton farms are caused by the unreliable supply of irrigation water due to deteriorating irrigation and drainage (I&D) facilities. The Project will cover the rehabilitation of I&D facilities on 47,500 ha in five districts. The five districts were selected through a systematic screening and stakeholder consultations that took into account social (predominance of poor households) and institutional factors, potential to increase economic and social benefits, and low operation and maintenance (O&M) costs. Rehabilitation of I&D will be complemented with improvement of land and water management, formation of water users' associations (WUAs) in core demonstration areas and the establishment of a WUA support unit in the Ministry of Water Resources and Land Reclamation (MWRLR). Together with improved land and water management practices, these project measures will increase yields and cropping intensities in both the cotton and household farms; will generate on-farm jobs; and thus, will ensure more stable and secure farm income. The Project is likewise pro-gender. Women-headed farm households and women farmers will be proactively involved in the whole project cycle and in the organization and development of WUAs. Nonincome poverty will also be partly addressed by the Project through the provision of rural potable water for a population of 57,000 in selected project areas.

Irrigation development in the project areas will lead to job creation and higher incomes. Approximately 153,000 poor farm households will benefit from the Project; generate an increase of 41% in *dekhan* farm incomes, and 33% in household plots incomes; and create opportunities for growth. Increased agricultural outputs (cotton by 23% and wheat by 21%) will lead to increased rural incomes, particularly among the poor. Improved agriculture activities will spur the demand for labor estimated at 750,000 labor-days. In sum, the economic benefits will redound more to the poor households than the beneficiary groups. Sustained income benefits to the poor households will translate in the medium term into a decrease in the poverty incidence in the project areas of 5%.

The Project will also produce indirect impacts. Improved land privatization efforts would accelerate the ability of the poor to generate income, as being an independent *dekhan* farmer consistently means more freedom of choice, more ability to follow the market, and ultimately higher incomes.

Full land privatization often results in cheaper farm inputs, as competition accompanies land privatization. Independent *dekhan* farmers in the project sites consistently reported agricultural input prices 50% cheaper than that input prices at collective *dekhan* farms. Lastly, nonincome poverty will be addressed in this Project by rehabilitating rural water supply systems, and 5,150 poor households are estimated to benefit from new potable water supply facilities.

C. Participation Process

Is there a stakeholder analysis? Yes No

Twelve stakeholder meetings were held in the project areas. A total of 175 stakeholders participated in the dialogues. Stakeholder representatives included those from local government, irrigation, and agricultural officials, teachers, doctors/health workers, women's groups, agricultural workers, *dekhan* farmers (independent and collective), landless laborers, *dekhan* farmers' associations, and local nongovernment organizations (NGOs). After gathering quantitative descriptive data from local village officials, discussions were held focusing on poverty (definition, causes, how to escape, etc.), village needs and demands, rural and agricultural structure, debt, socioeconomic profile, and prospects and constraints of WUAs. Wealth ranking and role playing exercises were also employed to more fully understand the villagers' perceptions, attitudes, and behavior toward poverty. During the stakeholder meetings, the participation exercises helped sharpen how the irrigation rehabilitation should be carried out and managed, and how the Project could be focused more to fight poverty (e.g., better water management, employing local villagers in civil works to the maximum extent possible, urging the government to accelerate and improve land privatization).

Is there a participation strategy? Yes No

The Project's participation strategy will focus on ensuring the involvement of the project beneficiaries—including the poor, women, and vulnerable groups—in all phases of project design, implementation, and monitoring. Both participatory

processes and local rural institutions will be established to operationalize these participatory approaches. Processes include (i) further stakeholder meetings at the village level as project design and implementation proceeds; (ii) a participatory and community-based monitoring and evaluation (M&E) mechanism and process focusing on strengthening local users' groups during the actual monitoring process; (iii) rehabilitation consultation/dialogues with farmers meeting regularly with irrigation canal management officials (primarily through the WUAs) to coordinate canal closings, water delivery times, and future irrigation canal management strategies; and (iv) intercommunity exchanges/immersions with Ministry of Water Resources and Land Reclamation officials, government policy makers, representatives of development partners, and project officials, to exchange experiences and improve implementation procedures. Rural institutions will include (i) WUAs formed in the irrigation systems focusing on improved irrigation management and on O&M; (ii) participatory water committees responsible for long-term O&M of the rehabilitated village water supply system; (iii) women's groups supported by international and local NGOs, focusing not only on activities specific to women, but also enlarging activities for women to fully participate in all project activities; and (iv) informal associations of independent *dekhan* farmers who have banded together for economies of scale.

D. Gender Development

A gender action plan has been prepared (Appendix 12) that will maximize the impact of this Project on women. The plan has five focal areas: (i) women's representation, (ii) skills enhancement for women, (iii) provision for a gender specialist, (iv) gender sensitivity in monitoring and evaluation, and (v) advocacy for gender and development.

Has an output been prepared? Yes No

E. Social Safeguards and other Social Risks

| Item | Significant/ Not Significant/ None | Strategy to Address Issues | Plan Required |
|---|--|---|---|
| Resettlement | <input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None | A short resettlement plan for nine families was prepared. | <input type="checkbox"/> Full <input checked="" type="checkbox"/> Short <input type="checkbox"/> None |
| Affordability | <input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None | Differential irrigation water charges will be used for different types of irrigation systems with different operational costs. Examine subsidies for use fees for the poor. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Labor | <input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None | A food-for-work program is included to address the low income of the extremely poor. Improved productivity arising from access to more reliable irrigation water coupled by better access to land and farm management practices, would increase demand, particularly for contractual farm work. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Indigenous Peoples | <input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None | None | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |
| Other Risks/ Vulnerabilities | <input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None | None | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No |

GENDER ACTION PLAN

A. Gender Status and Issues

1. Because of Tajikistan's civil war in the mid-1990s and the migration of men in search of work in Russia, female-headed households are very common in rural Tajikistan. It is estimated that about 18% of total rural households are headed by women. The share of this type of household is expected to rise as more men from rural areas migrate in search of work. As many of the men do not send remittances to their families from Russia, the women often have to play the multiple roles of earning income for their families, providing for their sustenance, and taking care of the children. In the project sites, the women are in charge of the garden plots, which are often the family's main source of food. Reliable access to irrigation water would help women increase their garden plot's productivity.

2. Aside from the garden plots, women augment their incomes by working. However, unemployment and underemployment in the villages are considered as the most important problems by villagers (especially the women). Some local officials estimated the level of unemployment in their areas at 80%. Often, there are only one or two employers in a given area, such as a cotton factory or school. Women traditionally work in the social (education and health) and agriculture sectors, where wages are five to eight times lower than salaries in the industry and construction sectors. The women's role in the cotton farms is particularly important during both the planting (spring) and harvest (fall) seasons when as many as 90% of the field workers are women and children. However, salaries as agricultural workers on the collective *dekhan* farms are extremely low. During cotton harvesting, agricultural workers are paid per kilogram picked, ranging from approximately 6 diram/kg to 55 diram/kg picked.

3. Any economic event in the cotton sector will have large implications on women's incomes, their time, and their families. On five different occasions during the 12 stakeholder meetings, women working in the cotton sector pointed out that they would need better water, land, and jobs. They said their present status as agricultural workers in the cotton sector was characterized by unreliable water supplies and few opportunities to join the ranks of independent *dekhan* farmers or find employment opportunities.

4. Increasing access to potable drinking water will favorably impact on women in the project areas. About 30% of the farm households in the project sites get water from rivers, lakes, and ponds. Over 40% of the project households use water from sources more than 100 meters away and the majority of those who fetch the water are women and children. Waterborne diseases are likewise common in these areas. Improved access to potable water supplies would thus help women play a more active role in village economic activities, as less time would be spent in carrying water and caring for the sick.

B. Gender Strategy and Action Plan

5. The Project will address these concerns by taking actions that on the one hand will improve (i) women's participation in the water users' association (WUAs), water committees, and in the planning, implementation, and monitoring and evaluation of the project; (ii) their access to project information; and (iii) their technical skills in farm production and organizational skills as they become involved in community-based organizations and project-related activities; and on the other hand will promote gender responsiveness among policy makers and other stakeholders involved in the project.

6. The Project's gender action plan will focus on:
- (i) **Women's representation.** The Project will ensure that in the provision and delivery of each of the four project components, the participation of women will be ensured. Under the rehabilitation of irrigation and drainage infrastructure component (a) 50% of households headed by women in the project sites will be members of the WUAs;¹ and (b) at least 25% of representatives in the project design, planning, and implementation meetings will be women. For the improvement of potable water supply systems component, women will constitute at least 30% of the members of the local drinking water decision-making bodies. In the support for agricultural development component, at least 30% of women farm workers will become members of local farmers' groups. In the project management, and monitoring and evaluation (M&E) component, at least 20% of the staff of project management offices, project implementation units, and the M&E units will be women.
 - (ii) **Skills enhancement for women.** The Project will ensure that at least (a) 20% of farm households headed by women participate in activities in the Project's core demonstration areas; (b) 25% of those trained in land and water farm management, new cultural practices, and rural water supply management are women; and (c) 25% of those participating in other organizational skills enrichment activities are women.
 - (iii) **Provision of a gender specialist.** A gender and social development specialist will be employed to (a) provide an assessment of the gender and social (including poverty) issues and concerns in the project sites using quantitative and qualitative methods of analysis, (b) develop a gender plan of action that will address the issues and concerns related to the project, and (c) develop an implementation mechanism and advocacy strategy for following through the action plan. The specialist will also assist in the design of the M&E system to ensure that it incorporates gender, poverty, and social concerns adequately.
 - (iv) **Gender sensitivity in monitoring and evaluation.** The gender and social development specialist will ensure that the design of the M&E system incorporates appropriate inputs, outputs, and outcome indicators that reflect women's concerns about the Project. The M&E system will also include a feedback mechanism to provide project staff with information and assessments of the perceptions and views of the Project's female and male beneficiaries on the progress and impact of the Project.
 - (v) **Advocacy for gender and development.** Gender and development as an integral policy outcome of the project will be pursued through the inclusion of gender-related agenda in the policy dialogues with central and local policy makers and in stakeholder meetings and other forums that will be initiated during the Project.

¹ This is the same target proportion as for farm households as a whole.

SHORT RESETTLEMENT PLAN

A. Background

1. The Irrigation Rehabilitation Project will improve the living standards of farming communities in project areas with improvements in farm household incomes through increased farm productivity and improved access to potable water. To achieve this the Project has four main components: (i) selected rehabilitation of irrigation and drainage infrastructure, (ii) support for agricultural development, (iii) improvement of potable water supply systems, and (iv) project management.
2. Within the Project, rehabilitation and improvement of irrigation and drainage systems and rural water supply systems have potential limited involuntary resettlement impacts.
3. All land in Tajikistan is state-owned. Land use is directed by the state through the district administrations, specifically the local offices of the State Land Committee and district administrative offices (Hukumat). Inheritable land use rights are provided for under Tajikistan's land tenure reform, but the process is at a very early stage of implementation. Tajikistan's Land Code addresses potential compensation for people who legally occupy government land and are forced to relocate, but the Land Code does not address compensation for people illegally occupying government land and forced to relocate.
4. **Potable Water Supply Systems.** In Asht district, the construction of a drinking water reservoir will require a village road to be moved slightly (a few meters), thus using some additional empty government wasteland. Additionally, it is possible that a small edge of a household fence, which encloses a large vegetable garden, may also have to be moved slightly (less than a meter [m]), along a distance of less than 5.0 m and thus involving no more than 5.0 square meter (m²). As the potential drinking water reservoir is fed by springs, the location of the reservoir is critical and it may be that other design options are not feasible. The actual degree of constraint will not be possible to determine until the topographical survey is carried out at the start of the design process. It is presumed that the fenced land is legally occupied and compensation would therefore need to be negotiated if the garden is to be encroached. It is quite possible that for such a small area, the compensation could be in kind, such as provision of a new fence and gate, rather than financial.
5. Additionally, some rehabilitation of rural water systems requires laying of underground pipes, which will require digging up agricultural land during the off-season, outside the growing period. Temporarily, therefore, this pipe laying could disrupt some agricultural land, though the land would be restored for the next growing season. There will be no impact on harvest from these activities and therefore no compensation will be required. The Ministry of Water Resources and Land Reclamation (MWRLR) has agreed that during the laying of underground pipes, households whose agricultural land is affected will be given priority for construction jobs with contractors to the maximum extent possible.
6. **Irrigation and Drainage Rehabilitation.** For irrigation and drainage rehabilitation, works will be confined within the boundaries of installations (e.g., pumping stations), or along linear structures (irrigation and drainage canals).
7. There will be very limited new construction in WRDRP. The priority for new construction in WRDRP is a new settling basin on government land near the intake of the main canal in Hamadoni district, Khatlon region. The size of the potential settling basin will be from 10 to 15 hectares (ha). Nine Tajik households without title or permission to use the land are presently

cultivating approximately 6.5 ha of government land at the settling basin site. The households members are not living at the site, they are only cultivating land at the site. No structures, therefore, would have to be moved or replaced. The size of the future settling basin requires less than half of the land potentially available for construction and therefore there is scope for selecting a more advantageous location and not extending to areas illegally and irregularly cultivated by persons residing in villages outside the site. Nevertheless, a short resettlement plan has been developed to adequately address and compensate these households, ensuring that their livelihood will not be negatively affected by the construction of the settling basin.

8. Seven of the nine households were contacted, interviewed, and consulted about the potential Project and the possible resettlement required. The size of the land being cultivated by the seven interviewed households is shown in Table A12.1.

Table A12.1: Size of Cultivated Land per Household

| Household | Estimated Size of Land Cultivated (hectares) |
|--------------|---|
| 1 | 0.80 |
| 2 | 1.40 |
| 3 | 0.61 |
| 4 | 0.50 |
| 5 | 0.20 |
| 6 | 0.02 |
| 7 | 3.00 |
| Total | 6.53 |

Source: Field surveys.

9. Farmers from the seven households contacted said the other two households farm have very small plots of land on the potential settling basin site, approximately 0.02 ha each.

10. Two of the seven interviewed households have four family members, and the other five households have from 12 to 24 family members. The heads of the seven households all have secondary level education, with two heads of households with technical secondary education, and two with university level education. Household members are either former or present employees of the District Irrigation Office and they are very familiar with the needs for irrigation system rehabilitation and a new settling basin. Five of seven households have children living and working in Russia.

11. The main crops grown in the 6.5 ha are wheat, onions, cucumbers, tomatoes, melons, and maize. The interviewed farmers did not know the exact yields of their crops, but they estimate that onions were at about 2.0 metric tons (mt)/ha, melon at 1.5 mt/ha, and maize at 4.0 mt/ha.¹ Three of the seven households (covering 3.63 ha of the total 6.53 ha) reported that the crops are for home consumption and they receive no cash income from the crops. The other four households (covering 2.9 ha out of the total 6.53 ha) estimated that they receive small annual incomes from the crops grown, ranging from 300-400 TJS/year (\$100–133), to 3,000 TJS/year (\$1,000).²

¹ The accuracy of their yield estimates is questionable and would require further verification. One respondent guessed his onion yield was 7.0–8.0 mt/ha.

² The accuracy of these income figures is also questionable. The respondents have no formal records of either their yields or incomes, and during the interviews the respondents said that they really did not know the yields or incomes. It was only when interviewers asked for estimates of yields and incomes, that the respondents provided information. Data from the Poverty and Social Analysis in nearby Farkhor District show annual household incomes range from about TJS2,600 (\$866) to TJS24,000 (\$8,000).

12. Six of the seven households reported that they were not farming land outside the land they are cultivating in the proposed settling basin site.³ One household reported that they have 0.7 ha of land outside the site.

13. During more qualitative discussions, the seven households were aware of the benefits to the entire district if a settling basin were to be constructed, as they all work for the district irrigation office. The respondents said they realize they have no title or permission to farm this land, but since the land was vacant, they started cultivating small plots there. The heads of household interviewed all agreed that they would have no objection to giving up this land for the settling basin. They agreed that being offered alternative land by the district Hukumat (administrative office) would be accepted, as well as receiving employment and wages during the construction of the settling basin. All nontitled affected persons will be allowed to harvest their crops before civil works start.

B. Scope of Land Acquisition and Resettlement

14. There will be no land acquisition during resettlement as the government presently owns the land, and there are no structures on the land. Only the 6.5 ha of cultivated land will be affected. There will be no loss of homes, but the loss of livelihood will be compensated.

C. Objectives, Policy Framework, and Entitlements

15. The Tajikistan Land Code (Article 48) states that if land is taken from a physical and juridical or legal person for state and public needs, those persons will be apportioned the same value of land, and losses including income will be fully compensated. The chief of the Department of International Relations at Tajikistan's State Land Committee has stated that the district-level Hukumat can compensate people who are forced to relocate, even if it is only cultivated land, not houses, that must be relocated. Extensive discussions have been held with the Hamadoni district Hukumat to ensure that the nine households receive full and complete compensation.

16. The Asian Development Bank (ADB) policy on involuntary resettlement addresses "losses of land, resources, and means of livelihood or social support systems, which people suffer as a result of ADB projects...". The proposed Project will not cause any population displacement, but there is the possibility that a few households may lose access to land from which they derive some income. Although these households do not possess land use rights, the resettlement plan ensures that those whose lives and incomes may be affected will be assisted to ensure the same level of well-being as prior to the Project.

D. Consultation and Grievance Redress Participation

17. Consultations with the affected people cultivating the 6.5 ha have been ongoing since the project preparatory technical assistance stage, involving trips to sites by both international and national consultants, consultations with the affected people, socioeconomic questionnaires, qualitative discussions with members of the affected households, multiple meetings with district-level and irrigation offices, and numerous discussions at the national level with the State Land Committee of Tajikistan, and the Ministry of Water Resources and Land Reclamation (MWRLR) in Dushanbe.

³ Like many rural households in Tajikistan, it is very likely that these seven households do have household gardens and presidential land plots outside the site, but during the interviews, they only referred to independent land outside the site.

18. All parties to the discussions have agreed to ensure the welfare of the nine affected households. Most of the nine households have members who are presently or previously employed by the district irrigation office. The district administration in Hamadoni district, in coordination with the district irrigation offices in Hamadoni and Farkhor, will address any appeals of affected persons.

E. Compensation, Relocation, and Income Restoration

19. There are three key elements related to compensation, relocation, and income restoration. First, the Hukumat of Hamadoni district has agreed to provide irrigated land for the nine households, of equal or better quality, for compensation for their potential loss of livelihood. Second, MWRLR has agreed that during construction of the settling basin, members from the nine households will be given priority for construction jobs with contractors to the maximum extent possible.⁴ Third, MWRLR has also agreed to the extent possible, qualified members from the nine affected households will be considered for employment with the district irrigation office. As noted above, most of the households have members already employed by the district irrigation office, making future employment even more likely.

20. There will be no housing relocation, as the households are outside the proposed construction site. Only cultivated land will be affected. The land provided to the households from the district authorities will also have to consider accessibility, fertility, and provision of irrigation water.

F. Institutional Framework

21. Planning, implementation, inspection, and assessment will be the responsibility of the district authorities, in coordination with the district irrigation office. The project management office (PMO) and MWRLR will also provide oversight to the implementation of the resettlement plan. Dissemination of information and public discussions with the affected people will also be undertaken at periodic intervals to ensure proper implementation of the resettlement plan and facilitate resettlement.

G. Resettlement Budget and Financing

22. There will be no land acquisition. For households that lose access to land, MWRLR will ensure that replacement land will be provided and households will receive land use rights on this land. There will be minor costs involved in monitoring and providing support for resettlement, and those costs, as well as any unforeseen costs, will be covered by the Project.

H. Implementation Schedule

23. Detailed planning and implementation of resettlement will take place well before the beginning of civil works construction of the settling basin. Details are provided in Table A12.2.

⁴ It should be noted that the seven households interviewed enthusiastically agreed that if they were able to receive employment during the construction of the settling basin, they would willingly give up their illegal cultivation on this 6.5 ha. The prospect of income-producing jobs seemed to outweigh their desire to continue cultivating these small plots of land. It is also difficult at this time to accurately estimate the potential income lost due to the loss of the 6.5 ha, as three of the seven households reported no income from the crops, and the other four households were very vague regarding income received from the crops. Though income was reported from these four households, farmers generally said that crops were for home consumption. In any event, jobs during the construction of the settling basin could pay as much as TJS300 per person per month.

Table A12.2: Approximate Schedule for Resettlement Efforts

| Activity | Time |
|--|--|
| Consultations with affected people, local authorities, and district irrigation office | Ongoing |
| Detailed resettlement planning and social preparation including a complete census of households eligible for entitlements (names of households and claimed land areas recorded by the PMO) prior to loan effectiveness | 6 months prior to construction |
| Finalization of new land site | 3 months prior to construction |
| Resettlement | 1 month prior to construction (condition for civil works commencement on settling basin) |

Source: Asian Development Bank estimates .

I. Monitoring and Evaluation

24. The PMO will implement a detailed monitoring and evaluation plan for the entire Project, including preparation, implementation, and after-effects. With regard to resettlement, the PMO will develop baseline data for monitoring indicators including: amount of land lost; amount of replacement land (of similar or better quality); number of jobs provided (temporary and permanent); compensation payments; and other assistance for moving, training, and tracking of household incomes (or agricultural incomes or output value). In support of these activities, affected persons will be invited to attend public meetings to discuss issues regarding the resettlement. The Executing Agency will submit quarterly progress reports to ADB on the implementation of the resettlement plan and a resettlement completion report.

J. Conclusion

25. The overall philosophy and thrust of the resettlement plan is to ensure that the nine households cultivating the 6.5 ha without titles will be fully compensated for any economic, social, or institutional distress they may suffer as a result of the construction of the settling basin benefiting approximately 17,700 ha. The resettlement plan is designed to ensure that these nine households are in no way adversely affected by their cultivation on the government land.