

ASIAN DEVELOPMENT BANK

RRP: KGZ 30320

**REPORT AND RECOMMENDATION
OF THE
PRESIDENT
TO THE
BOARD OF DIRECTORS
ON A
PROPOSED LOAN
AND
TECHNICAL ASSISTANCE GRANT
TO THE
KYRGYZ REPUBLIC
FOR THE
AGRICULTURE AREA DEVELOPMENT PROJECT**

November 1999

CURRENCY EQUIVALENTS **(as of 15 November 1999)**

Currency Unit	–	Som
Som1.00	=	\$0.02272
\$1.00	=	Som44.0175

The exchange rate for the som is determined on a managed float basis through periodic foreign exchange auctions. The calculations in this report are based on an exchange rate of Som42.00 = \$1.00, the rate prevailing during appraisal.

ABBREVIATIONS

AADP	–	Agriculture Area Development Project
ADB	–	Asian Development Bank
ASSP	–	Agricultural Support Services Project
CLAR	–	Center for Land and Agrarian Reform
COA	–	Chui Oblast administration
DWR	–	Department of Water Resources
EIA	–	environmental impact assessment
EIRR	–	economic internal rate of return
EU-TACIS	–	European Union Technical Assistance for the Commonwealth of Independent States
FIRR	–	financial internal rate of return
FSU	–	former Soviet Union
GDP	–	gross domestic product
HYDROMET	–	Hydrometeorological Agency
IEE	–	initial environmental examination
IFAD	–	International Fund for Agricultural Development
IRP	–	Irrigation Rehabilitation Project
KAFC	–	Kyrgyz Agricultural Finance Corporation
MAWR	–	Ministry of Agriculture and Water Resources
MEP	–	Ministry of Environmental Protection
NGO	–	nongovernment organization
NPV	–	net present value
O&M	–	operation and maintenance
PIU	–	project implementation unit
PMU	–	project management unit
PSC	–	project steering committee
RADS	–	Rural Advisory and Development Service Foundation
RCLAR	–	Republican Center for Land and Agrarian Reform
RFP	–	Rural Finance Project
SCF	–	standard conversion factor
SDP	–	Sheep Development Project
SOE	–	statement of expenditure
TA	–	technical assistance
UPF	–	unified peasant farms
WUA	–	water users association

NOTES

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

CONTENTS

	Page
LOAN AND PROJECT SUMMARY	ii
MAP	v
I. THE PROPOSAL	1
II. INTRODUCTION	1
III. BACKGROUND	1
A. Economy in Transition	1
B. The Agriculture Sector	2
C. Chui Oblast	4
D. Government Policies and Plans	10
E. External Assistance to the Sector	11
F. Lessons Learned	12
G. ADB's Sectoral Strategy	13
H. Policy Dialogue	13
IV. THE PROPOSED PROJECT	14
A. Rationale	14
B. Objectives and Scope	16
C. Cost Estimates	21
D. Financing Plan	21
E. Implementation Arrangements	22
F. Executing and Implementing Agencies	26
G. Environmental and Social Measures	26
V. TECHNICAL ASSISTANCE	27
VI. PROJECT JUSTIFICATION	28
A. Financial and Economic Analyses	28
B. Environment	30
C. Social Dimensions	31
D. Impact on Poverty	31
E. Project Risks	31
VII. ASSURANCES	33
A. Specific Assurances	33
B. Conditions for Loan Effectiveness	35
C. Conditions for Disbursement	35
VIII. RECOMMENDATION	35
APPENDIXES	36

LOAN AND PROJECT SUMMARY

Borrower

The Kyrgyz Republic

Project Description

The proposed Project is the Asian Development Bank's (ADB's) third project in agriculture and rural finance and builds on support under the ADB-funded Agriculture Sector Program loan and the accompanying technical assistance, which have been assisting the Government with its policy and institutional reform program for the sector. The Project is adopting a new area-focused approach to project investment in the agriculture sector in the Kyrgyz Republic as nearly all major ongoing development projects are currently being implemented on a nationwide basis. Chui Oblast has been selected for its potential for agricultural growth and development and its importance to the economy. The Project will (i) address constraints in farm restructuring, drainage and irrigation, input supply, machinery hire services, marketing, and finance; and (ii) aim to integrate ongoing and planned activities to maximize the impact of the Project and other development activities.

Classification

Primary—economic growth
Secondary—poverty reduction

Environmental Assessment

Category B
An initial environmental examination was undertaken and the summary is a supplementary appendix.

Rationale

The crop, livestock, and agro-industrial subsectors are continuing to experience substantial adjustments, partly in response to the ongoing reforms in the agriculture sector. The sector reforms are continuing; however, progress in their effective implementation has been variable across the regions. Agriculture is underperforming as many of the farms and agroprocessing facilities are not operating efficiently and are not financially viable. A concentrated and coordinated focus on the key constraints at the farm level to bring together the ongoing and planned investment projects and enhance their impact will be adopted to improve farm productivity and profitability. The challenge to the Project is to integrate the various supporting initiatives into a coordinated agriculture development program aimed at clearly supporting the key investment needs and related linkages between public sector investment and private sector initiatives.

Objectives and Scope

The long-term development goal of the Project is to increase the incomes of farmers in Chui Oblast. The immediate project objective (purpose) is to increase farm productivity and profitability in selected areas. Within Chui, the Project will focus initially on selected geographical areas that coincide with the boundaries of the former state and collective farms. The selection

criteria are identified, but participation will depend on the demand, capability, and willingness of individual farms and enterprises. There are four components: (i) farm development, (ii) drainage and irrigation, (iii) development of private sector marketing and input supply services, and (iv) project management. The Project will provide on-the-job training and other training to increase the understanding and level of skills of farmers and entrepreneurs.

Cost Estimates

The estimated total cost of the Project is \$45 million equivalent, comprising \$22.3 million in foreign exchange costs and \$22.7 million equivalent in local currency costs.

Financing Plan

Source	Foreign Currency	Local Currency	Total Cost	(\$ million)
				Percent
Asian Development Bank	19.5	16.5	36.0	80
Government	2.8	4.7	7.5	17
Beneficiaries	0.0	1.5	1.5	3
Total	22.3	22.7	45.0	100

Loan Amount and Terms

The loan in various currencies equivalent to Special Drawing Rights 26,159,000 from ADB's Asian Development Fund will have an amortization period of 32 years, including a grace period of 8 years, with an interest charge at the rate of 1 percent per annum during the grace period and 1.5 percent per annum thereafter.

Period of Utilization

Until 31 December 2006

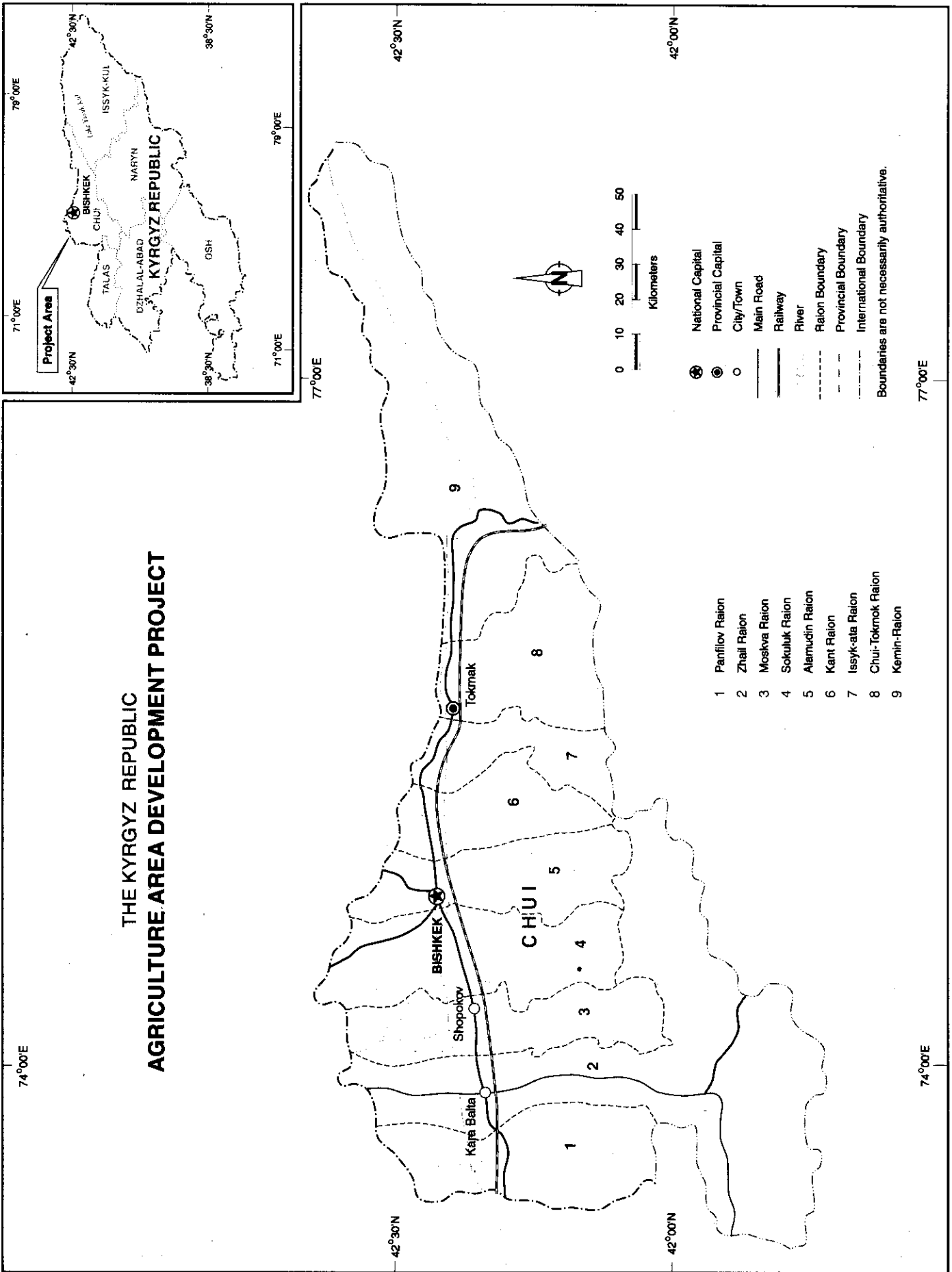
Implementation Arrangements

The management arrangements for the Project comprise a project steering committee, executing agency, implementing agency, and project management and implementation units. Implementation will be guided by a steering committee. The Ministry of Agriculture and Water Resources (MAWR) will be the Executing Agency, and the Chui Oblast administration will be the Implementing Agency. To assist the oblast in managing the Project, a project management unit (PMU) will be established and be responsible for day-to-day project implementation. The PMU will be headed by a project director. A separate project implementation unit in the Department of Water Resources of MAWR will be responsible for the drainage and irrigation component in cooperation with the PMU.

The transition process is characterized by constant economic, social, and institutional change as the economy moves toward a market-based system. The Project will therefore adopt a process approach to implementation to accommodate this situation and

be sufficiently flexible to meet unexpected circumstances and demands.

Executing Agency	Ministry of Agriculture and Water Resources
Procurement	Goods and services for the Project will be procured in accordance with ADB's <i>Guidelines for Procurement</i> . Major equipment will be procured by international competitive bidding or international shopping, and office furniture and equipment by direct purchase. Civil works will be carried out under local competitive bidding.
Consulting Services	A total of 1,869 person-months of international and domestic consulting services (120 international and 1,749 domestic). Consultants will be selected in accordance with ADB's <i>Guidelines on the Use of Consultants</i> and other arrangements acceptable to ADB for the engagement of domestic consultants.
Estimated Project Completion Date	31 December 2006
Project Benefits and Beneficiaries	The Project will fully benefit an estimated 8,000 households and another 2,600 to a lesser extent. Those benefiting fully from all activities are estimated to increase their income per hectare of irrigated land threefold from the current level of approximately \$17-\$50 in real terms at the end of 10 years. Those benefiting less will increase incomes by about 20 percent as these farmers are expected to be more constrained in accessing working capital and investment loans. At least 25 percent of the project beneficiaries will be poor farmers. The Project's overall economic internal rate of return is 15 percent. Nonquantifiable benefits include reduced water losses; improved land management; reduced salinity, alkalinity, waterlogging, and erosion; and reduced Government budget support for operation and maintenance of irrigation systems.
Technical Assistance	Advisory technical assistance (TA) for institutional strengthening in planning and management of agricultural development will assist the Chui Oblast administration in coordinating and implementing various development activities. Proper systems and procedures will be established for planning, implementation, and monitoring these activities. The total cost of the TA is \$941,210 equivalent, of which \$800,000 will be financed by ADB on a grant basis from the ADB-funded TA Program. The TA will require 24 person-months of international and 20 person-months of domestic consulting services. The Chui Oblast administration will be the Executing Agency.



I. THE PROPOSAL

1. I submit for your approval the following Report and Recommendation on a proposed loan to the Kyrgyz Republic for the Agriculture Area Development Project. The Report also describes proposed technical assistance for Institutional Strengthening in Planning and Management of Agricultural Development, and if the proposed loan is approved by the Board, I, acting under the authority delegated to me by the Board, shall approve the technical assistance.

II. INTRODUCTION

2. The proposed Project was prepared under Asian Development Bank (ADB) technical assistance (TA)¹ conducted from August 1998 to January 1999. The objectives were to (i) analyze developments in Chui Oblast and the constraints to and opportunities for improving agricultural productivity and profitability; and (ii) prepare a project to deliver a range of infrastructure investments and services, and institutional improvements. A loan Fact-Finding Mission was conducted from 1 to 26 March 1999, a Preappraisal Mission from 2 to 30 June 1999, and an Appraisal Mission from 3 to 24 September 1999. This Report is based on the findings of these missions; the reports prepared by the TA consultants; and discussions with the national Government, Chui Oblast administration (COA), potential project beneficiaries, and funding agencies active in the sector. The project framework is presented in Appendix 1.

III. BACKGROUND

A. Economy in Transition

3. The Kyrgyz Republic, which became independent in 1991, is in the midst of a major effort to transform the economy from a centrally planned to a market-based system. Despite the varying economic and social conditions, the Government has continued its commitment to the reform process, simultaneously adopting policies for macroeconomic stabilization and comprehensive sectoral and structural reforms.² The broad sectoral and structural reform measures have included (i) enterprise reform and privatization, (ii) industrial and trade policy reform, (iii) promotion of private sector development, (iv) financial sector reform, and (v) social safety net reform. The Kyrgyz Republic is considered by the funding community to be the most advanced among the Central Asian republics in macrostabilization and structural reforms. It is the first Central Asian republic to (i) successfully complete an International Monetary Fund (IMF)-supported Enhanced Structural Adjustment Facility program;³ and (ii) obtain formal membership in the World Trade Organization in October 1998.

4. The continuous contraction of the economy stopped in 1996, with inflation falling to 16 percent and gross domestic product (GDP) registering the first increase of 5.6 percent. In 1997, the recovery continued with real GDP growing at 9.9 percent and inflation falling further to 14.7 percent. Per capita GDP was \$385. This recovery continued into 1998 until mid-August when the Russian crisis resulted in a serious decline in the economy. Real GDP growth fell dramatically to 1.8 percent and inflation was 18.3 percent, against targets of 6 percent and 12 percent, respectively. Moreover, the som devalued by 32 percent between August and year-end. The budget deficit was 9.9 percent of GDP, the current account deficit increased to 22.6 percent of GDP from 7.8 percent in 1997, the trade deficit widened to \$220 million from \$15 million in 1997, and external debt deteriorated to 65.8 percent of GDP. The effects of the Russian crisis have continued through 1999 and at the end of August, GDP

¹ TA 3017-KGZ: *Agriculture Area Development Project*, for \$900,000, approved on 12 May 1998.

² For further discussion of the economy, the reform process, and more recent economic developments, see the *Country Economic Review*, 1999; and *Country Assistance Plan* (2000-2002), August 1999.

³ Discussions on the Second Annual Arrangement under the Enhanced Structural Adjustment Facility have been delayed and are not expected to be finalized in 1999.

growth was 2 percent, inflation was 30.8 percent, and the som had depreciated further to 42.6 to the dollar. These recent developments clearly demonstrate the Kyrgyz Republic's continued dependence on the former Soviet Union and its high vulnerability to external shocks.

5. The ongoing transition has also resulted in (i) a sharp decline in the active working force of the formal economy, (ii) considerable hidden unemployment, (iii) a growing informal sector, and (iv) a change in the composition of jobs provided by the economy. Registered unemployment was 3.1 percent of the labor force in 1998, while the overall rate of unemployment and underemployment amounted to over 20 percent. Unemployment among the young and women is a particularly serious problem, and is continuing to increase with 60 percent of the unemployed being women, about 37 percent of whom are under 29 years of age (1998). Real wages have fallen significantly.

6. The transition has also resulted in increased levels of poverty. Fifty percent of the total population in 1996 and 1997 were poor, and the level of extreme poverty fell from 19.1 percent in 1996 to 14.8 percent in 1997.⁴ However, poverty is not evenly distributed—65 percent of the poor were living in rural areas in 1997—with the gap between the urban and rural areas increasing. The gap between extreme poverty and general poverty in rural areas is 21 percent, four times that in urban areas. Geographically, poverty is not evenly distributed among the oblasts. Naryn Oblast is the poorest, with 90.5 percent generally poor and 58.7 percent extremely poor. Chui is the least poor with 26.6 percent generally poor and 3.5 extremely poor.

7. The major issues related to rural poverty include a dependence on subsistence agriculture and limited access to social services. Subsistence agriculture is the major economic activity for most rural households, and the poor are less able to diversify agricultural activities primarily because of limited resources to invest. In addition, the opportunities for poor landowners to access agricultural wage labor have also declined. The access of rural poor households to social services has deteriorated in both quantity and quality. There has been a drastic fall in living standards despite the high levels of education, low levels of open unemployment, availability of housing, as well as the kin and community support networks. Reduced food consumption, lower nutritional value of consumed foods, reduced access to health care and medicines, and greater chances of infection, particularly for the vulnerable groups, indicate a higher incidence of poverty and reduced quality of life. New groups of vulnerable people have emerged: elderly, pensioners, poor households who are unable to undertake farming, and female-headed households with many young children.

8. Women have traditionally had an equitable position in society and the State during the socialist period. However, the effects of the transition on women have been different and more drastic than those on men. Women have been the first to lose their jobs as these were in the government and the social sectors, and have suffered on account of the scaling back of social services. In rural areas, women are legally entitled to equal landownership as men, but the process of registration allots land to the family in the name of the household heads, who are mostly men. While women are legally entitled, the head of the household makes decisions that can disadvantage women. Women are active in the informal bazaar economy, and this is often what stands between households and poverty.

B. The Agriculture Sector

9. The Kyrgyz Republic is predominantly a rural economy with more than 65 percent of the population living in the rural areas. Agriculture and related enterprises are the most significant areas of activity. The agriculture sector accounts for more than 45 percent of GDP, 40 percent of employment, and 30 percent of export earnings. Agricultural land, excluding pastures, comprises only

⁴ Poverty is measured as per capita total consumption. The general poverty line was Som4,647 per capita per annum in 1997 (Som4,460 in 1996), and the extreme poverty line was Som2,439 in 1997 (Som2,217 in 1996). World Bank. 1999. *Update on Poverty in the Kyrgyz Republic*, June.

7 percent of the total land area, with irrigation covering 78 percent of the agricultural land. Agriculture's share of the national budget is about 4 percent.

10. Since independence, the Government has been steadily implementing a program of agriculture sector reforms focusing on (i) land reform and privatization of state and collective farms; (ii) liberalization of commodity prices and trade; and (iii) demonopolization and privatization of input supply, and output marketing and processing enterprises. Both ADB and the World Bank have supported the Government's reform program. ADB provided support through the Agriculture Sector Program loan.⁵ The World Bank support was through the Agriculture Privatization and Enterprise Adjustment Credit.⁶ Under this assistance the Government undertook measures to (i) support land reform; (ii) improve the use of irrigation, particularly by encouraging the formation of water user associations (WUAs); (iii) increase the competitiveness of the input supply system through privatization of State-owned enterprises and agencies attached to the Ministry of Agriculture and Water Resources (MAWR); (iv) restructure and privatize State-owned enterprises involved in marketing and processing; (v) reduce restrictions on the export of such products as cotton and wool; (vi) enhance social protection through support for social assistance funding; (vii) protect the environment by focusing on managed grazing of natural pastures and forested areas; and (viii) enhance the capacity of selected Government agencies to implement the reform program and provide the required support for a market-based agriculture sector.

11. There has been substantial progress to date in many areas of reform. All 477 state and collective farms, other than those retained for seed development and cattle breeding, have been privatized. The private farms, comprising mainly individual farms, peasant farms, and peasant associations, are expanding. They accounted for about 37 percent of total agricultural output during the first eight months of 1999, even though they occupy only 21 percent of the total arable land.⁷ Land reform is basic to the transition process. Under the current legislation, pastureland and water resources remain the property of the State. Agricultural land has been distributed to members of the former state and collective farms on the basis of land shares which originally conveyed long-term use rights to the holder. A referendum in October 1998 established a constitutional right to private ownership of land. Subsequent legislation in June 1999 converted the existing use rights into private freehold ownership.⁸ However, a presidential decree prohibits the sale of land for up to five years from September 1998. The eventual lifting of this moratorium on land sales, combined with the implementation of the Land Code and laws on land registration and mortgage, will provide the basis for the establishment of a land market.

12. Legislation pertaining to irrigation has evolved rapidly during the transition, and much of the basic legal framework is in place for the management of irrigation water in a market economy. The water law inherited from the Soviet period is in need of substantial revision, and assistance is being provided for this purpose by the Food and Agriculture Organization (FAO) and the United States Agency for International Development. In relation to irrigation legislation, a number of refinements are necessary and will be introduced as part of the process of review of the water law and related legal instruments. For example, water use is subject to licenses for use rights that may be restricted during drought and may be withdrawn when a water user misuses or fails to use the water. Water rights are limited to a given use for which the right is issued. The government resolution on WUAs ties water rights to the land and to specific irrigable plots so that when land is transferred, the water right accompanies it. Therefore, a WUA does not own the water right associated with its command area, which remains the right of the individual landowner. Thus, the WUA does not have the power to enforce sanctions. A draft Law on WUAs is under preparation and will address these issues and replace the government resolution on WUAs.

⁵ Loan 1407-KGZ, for \$40 million, approved on 23 November 1995.

⁶ A \$45 million credit, approved in June 1995.

⁷ National Statistics Committee. 1999. *Update on the Situation of Land and Agrarian Reform in the Kyrgyz Republic*.

⁸ Law on the Introduction of Actions of the Land Code of the Kyrgyz Republic, 2 June 1999.

13. The transformation of land share, now landownership rights, into legal farm entities is not being actively pursued. Many farm entities are not established in accordance with the legal requirements of the Civil Code, and many have internal structures that are highly unstable. Numerous owners have used their land to establish an individual farm enterprise or have pooled their land with other families to establish a peasant farm enterprise. Other landowners leave their land in cooperative enterprises, generally known as unified peasant farms, which replaced the collective or state farms but retain the former management system. Landowners retain the right to withdraw their land from a farm enterprise even if the land had been contributed to its charter capital. As a consequence, newly established farm entities are unstable, even those that are registered and have a legal status. Most own a few assets that can be mortgaged to secure credit, especially investment loans.

14. Agricultural output declined continuously from 1990 to 1995, in parallel with the general economic contraction. According to official figures, in 1996 the real value of agricultural output increased for the first time since Independence by an estimated 13.1 percent over the 1995 level. In 1997, agricultural output increased by 12.3 percent then slowed to 4.1 percent in 1998. Preliminary figures indicate a 6.4 percent increase in 1999. The agriculture economy is likely to suffer further from the Russian crisis as exports to Russia, Kazakhstan, and Uzbekistan comprise agricultural commodities for which there is a reduced demand while exporters encounter other major impediments, such as informal barriers to trade.

15. While the Government has been pursuing reforms, the supply-side response in the agriculture sector has generally been less than expected due to (i) the extent of the reform measures relative to the immensity of the challenges facing the Government, (ii) the length of time required for the reforms to diffuse through the sector, (iii) the relatively ineffective implementation of some reforms at the local level, and (iv) increasing poverty and limited income opportunities in the rural economy. As a result of the difficulties associated with the breakup of the integrated Soviet economy and the transition to market-based institutions, agricultural producers have tended to retreat from commercial production to subsistence operations and barter exchange, while input supply, agroprocessing, storage, and distribution activities have generally collapsed.

C. Chui Oblast

16. Chui Oblast in the north of the country has an area of 20,330 square kilometers (km²) and a population of 768,000 (1997). The estimated rural population is 591,000 or 77 percent. Chui accounts for 18 percent of the national population excluding Bishkek, but 32 percent with Bishkek. The oblast has nine raions (districts),⁹ with the population heavily concentrated in the raions close to Bishkek. Chui accounts for 30 percent of the national agricultural output and 26 percent of the national GDP.

17. In Chui, the rural poor form 27 percent of the total population and the extreme poor 3.5 percent. Households with three or more children and two to three adults are likely to be poor. The highest percentage of poor households comprise those whose heads are unemployed, have low levels of education, are invalid, are incapable of working, and look after their own children. Female-headed households with several children are likely to be poor. Overall, the level of poverty in Chui is less than in other oblasts of the country.

1. Agriculture Situation

a. General

18. Land share distribution in Chui has been undertaken in two phases. In the period 1994-1996, individual beneficiaries were issued land share rights certificates, whereas, in accordance with the law, certificates should have been issued to the heads of households incorporating the land share rights of all family members. This legal requirement was followed in other oblasts. In Chui, a second

⁹ Two raions (districts) have recently merged, reducing the number to eight.

distribution of land share certificates became necessary to provide certificates to every household head. The distribution is virtually complete. At the national level, there are 1,400,000 hectares (ha) of agricultural land (land under annual or perennial crops or temporarily fallow) of which 25 percent has been retained in the Agricultural Land Redistribution Fund. In Chui, the Fund accounts for about 108,000 ha of some 455,110 ha of arable land. Fund land is managed by the village government and is generally leased on an annual basis, but arrangements are being developed for the long-term leasing and/or sale of such land.

19. Agricultural production in the oblast has declined since independence. Nevertheless, there is a significant surplus of most basic food items including cereals, meat, milk, fruit, and vegetables. At the national level, there is a substantial deficit in some commodities, particularly vegetable oil and sugar. During the Soviet period, the oblast was a major exporter of agricultural products and the current surplus is due to a massive decline in demand since independence because of loss of the export markets and reduced buying power in the domestic market. While some produce goes to markets elsewhere in the country, significant amounts of milk, sugar, vegetables (especially onions), and potatoes continue to be exported mainly to Kazakhstan and Russia. Eggs, vegetable oils, and sugar are imported in significant volumes. Many small producers, whose numbers are increasing, have difficulty finding outlets for relatively small quantities of produce. Also, the proliferation of the sources of supply has resulted in a wide range of quality standards. A substantial amount of produce does not meet the requirements of the upper income group, local processors, or export markets.

20. The total farmed land area of 1.36 million ha includes 455,110 ha of arable land, of which 330,110 is irrigated and 125,000 is rainfed. The remainder comprises land that is not cultivated and is primarily used for rough grazing. While the 11,233 individual and 4,979 peasant farms comprise the largest number of entities, they respectively average 5.3 ha and 17.9 ha and account for 12.5 percent of total agriculture land. The 166 unified peasant farms have an average 4,460 ha and account for 62 percent of the land area. The official farm typography recognizes six farm types and is based on size and organizational structure. These structures are transitional and are continually evolving. The farm types are individual farms (11,233), peasant farms (4,979), cooperatives and associations of peasant farms (57), unified peasant farms (166), joint-stock companies (25), and state farms (31). By October 1998, the oblast's 129 former state and collective farms had reorganized into over 16,400 separate farming entities. The vast majority of new farms are too small to be sustainable and a small number of large farms, which are generally the unified peasant farms type, retain many of the characteristics of the former state and collective farms.

b. Drainage and Irrigation

21. Agriculture in Chui depends on irrigation. The irrigated area is an estimated 330,110 ha or 30 percent of the national total. Of this, individual farms account for 15 percent, peasant farms 23 percent, and unified peasant farms 36 percent. An estimated 172 interfarm canals each serve a small hydraulic unit or interfarm canal command area with an average size of about 2,000 ha. The boundary of the former state and collective farms generally coincided with the boundary of these hydraulic units. All major irrigation infrastructures have been operational for 20 years or more. The system currently functions only partially and requires substantial review of its structural integrity, underlying design assumptions, affordability, and manageability.

22. Only 17 permanent diversion structures¹⁰ provide reasonably well-regulated inflow volumes, and in 39 nonpermanent structures the inflow can be regulated either to a much lesser extent or not at all. Flow-regulating devices are either not operational or missing on 30-50 percent of all interfarm canal structures.¹¹ Consequently, the current operation of interfarm canals provides largely

¹⁰ One diversion structure commands an irrigable area of 1,000-5,000 ha.

¹¹ The term interfarm canal results from the fact that former state and collective farms were territorial units with boundaries unrelated to the limits of the hydraulic infrastructure. Most interfarm canals are in the hydraulic sense either secondary canals when taking off from main canals or primary canals when taking off from the local stream.

unpredictable flows and an erratic and unreliable supply of irrigation water to fields. Moreover, a large accumulated backlog of maintenance in the interfarm system has led to the need for the removal of sediment and rehabilitation of in situ lined and precast concrete-lined canals.

23. The on-farm infrastructure for irrigation water distribution consists of 863 on-farm canals comprising 3,247 km (61.7 percent) of earth canals and 2,010 km (38.3 percent) of concrete canals. More than 60 percent of all structures are deficient, either allowing for only restricted operation, or being inoperable.

24. Of an estimated 303 groundwater wells for irrigation, more than 70 percent require urgent attention and a further 27 percent are rated as beyond repair. In the past, irrigation from wells was not of major significance. At present, a number of free-flowing artesian wells can provide water at a very low cost to the surrounding area. With the emergence of small farms, those located in areas with an operational well will have a relative advantage over areas depending wholly on irrigation water supplied by gravity.

25. In the past, sprinkler irrigation was practiced on a large scale for about 134,000 ha or 40 percent of the irrigable area. There has been a massive shift from sprinkler to less energy-demanding methods and gravity irrigation is now practiced on more than 90 percent of the irrigable area. However, there have been no major land leveling operations in the last seven to ten years to correct the loss of an even field surface gradient. Only 38 percent of the total irrigable area has good operational status.

26. The drainage infrastructure consists of open collector drains and closed (piped) drains. The former are usually not more than about 4.0 meters (m)-5.0 m, and the latter about 2.5 m-3.5 m below ground level. Almost 4,000 km of drains have been installed in Chui. Open drains have been installed on about 107,400 ha or 32 percent of the irrigation area; those on 34,000 ha or 32 percent are considered in good condition. The remaining 68 percent are deficient and in urgent need of repair. The situation is similar for closed drains that cover some 57,000 ha. About 25,650 ha or 45 percent are in reasonably good condition, 40 percent are in fair condition, and 15 percent are in poor condition and possibly beyond repair.

27. The maintenance of open collector drains is a routine task. Due to changes in land ownership and farm structure, much of the routine maintenance has been discontinued. Maintenance of drains has been left to the larger units remaining after the breakup of the former large farms, or to the emerging WUAs. These organizations do not have appropriate and essential equipment for the efficient execution of maintenance work. It is necessary to review the adequacy of the inherited drainage system in relation to the emerging landholding and farming structure, taking particular account of the smaller size of farms and the more diversified cropping patterns.

28. The existing on-farm canals provide only a most rudimentary system, which will have to be adapted to the needs of emerging farms. The on-farm works consist mostly of temporary structures, which bear little relationship to emerging farm boundaries. However, it is still too early to predict the farming structure that will emerge in any given interfarm command area.

c. Farm Productivity

29. The cultivated area in Chui has declined from 418,000 ha in 1991 to 399,000 ha in 1997.¹² There have been marked changes in the cropping pattern. The area under cereals has increased, particularly that for wheat which now accounts for 66 percent of the cultivated area. This increase in

¹² The concept of cultivated land includes perennial grasses, which would normally be cultivated once every three to five years. In addition, the rapidly growing area of fallow is likely to be land no longer cultivated. Thus, the area actually being cultivated on an annual basis has declined more significantly than the statistics suggest. In 1997, the figure would more likely be 359,000 ha.

wheat has been mainly at the expense of forage break crops, which have declined by 53 percent. As a consequence, most farms no longer practice an agronomically sustainable rotation.

30. Average yields have declined for almost all crops as a result of multiple constraints to farming activities, which stem from the low profitability of most farms and a consequent lack of liquidity. Farming is caught in a low input-low output downward spiral. The main problems include the supply and on-farm management of irrigation water, poor seed quality, very restricted use of fertilizers and agrochemicals, a shortage of management and technical knowledge on emerging farms and among farmers, and reduced efficiency and the deterioration of farm machinery.

31. On-farm irrigation methods are primitive and often inaccurate. They fail to supply the desired volume of water required and hence restrict crop yields. The situation is exacerbated by other factors. Inadequate primary and secondary cultivation (including leveling) is particularly significant, resulting in uneven seedbeds, poor control of sowing depth, poor germination, and low seedling survival. Most of the irrigated area is under low-value crops, with a high proportion comprising relatively low-value grains. Grain accounts for 80 percent of the income from crops and almost half of farm income. This is a very high proportion and explains the use of grain in barter exchange and the lack of markets for alternative cash crops. Farm development and economic viability will be severely restricted if farmers continue to grow large areas of low-value crops in a low-input system on irrigated land. Such farming systems cannot afford the considerable investment that is required to rehabilitate and maintain the irrigation system and replace machinery. Low productivity is reflected in low farm income. A substantial increase in productivity and net margins, in particular for crops with export potential, is fundamental to farm and agricultural development.

32. Soil salinity and alkalinity occur naturally within the oblast due to the basic nature of the soils, the occurrence of mineral salts, and rising groundwater levels. In 1997, an estimated 70,000 ha or 21 percent of the irrigable land was affected by some salinity and 5.2 percent or 17,000 ha by the occurrence of adverse alkalinity levels.

33. There has been a drastic reduction in the demand for most farming inputs, which is a reflection of the inadequate demand for produce and lack of liquidity in the farming sector. In Chui, the supply of basic farming inputs is adequate to meet the low level of demand. Some input supply services are functioning, often with a degree of State involvement. They operate on a barter basis, providing an advance supply of inputs against the crop harvest; however, they have considerable difficulty securing payment.

34. As a result of the privatization of the state and collective farms, machinery assets have been dispersed to many new owners. Since independence, there has been little investment in machinery and, consequently, a high proportion has reached the end of its useful life. Small farms rely on contract services provided by the larger farms, which give priority to their own needs. The contract services therefore are often received late. Machinery hire is expensive relative to productivity although the charges often fail to reflect the full cost, especially depreciation/replacement costs. Most farm machinery is oversize in relation to the size of the emerging small farms and fields and is of poor quality.

d. Farm Debt

35. There are two main categories of farm debt: debt incurred through Government or budgetary credits, which accounts for about 25 percent of all debt; and commercial debt, which accounts for 75 percent of all debt and includes nonpayment of taxes, salaries, and pension contributions as well as outstanding payments to utilities and private commercial companies. Debt obligations do not appear in farm accounts. Total farm debt in Chui was approximately Som400 million at the end of 1997, or about \$60 per irrigated hectare. In the case of large farms, as much as 30 percent of their irrigated land is encumbered, and a further 40 percent can have problems paying off debts at current levels of productivity.

2. Institutions

36. Institutional development needs in the agriculture sector cover a wide range of agencies from the national MAWR to the village governments. There has been a substantial change in the institutional framework since independence. ADB has been providing assistance since 1996.¹³ MAWR has overall responsibility for agriculture sector policy and strategic development. However, its functions are performed often only partially or not at all. Frequently, lack of resources means that functions are not carried out properly and made effective, particularly at the local level. Key decisions concerning agriculture sector policy are taken outside MAWR, usually in the office of the President.

37. The Department of Water Resources (DWR) is responsible for the administration of all agricultural water resources. The resources of DWR are insufficient to provide a comprehensive system of water management from the watershed to the farm headgates. The department oversees the regulation of water resource use, the balance between available resources and demand, and the issuance of water licenses and contracts. It retains sole responsibility for the development, construction, operation, and maintenance of interfarm irrigation systems. There are about 35 employees at the headquarters of DWR in Bishkek and 4,800 employees in the oblast and raion departments. Of the latter, about 2,850 are unskilled.

38. DWR is changing from an agency delivering water as an essentially free input to one which must increasingly sustain itself through the provision of services to farmers for a fee. This entails reducing the cost of supplying water and increasing the level of recovery of operation and maintenance (O&M) costs. DWR receives revenue from the Republican budget and from water user charges. In 1998, the sources accounted for Som153 million and Som66 million, respectively. Water charges are retained in the raion-level departments to operate the system, pay salaries, carry out capital repairs, and conduct routine maintenance.

39. Water users do pay most of the water tariffs billed by DWR. About 80 percent is collected nationally; in Chui about 78 percent was collected in 1997. The water fee schedule, which was recently increased to Som0.03/cubic meter (m^3) from Som0.015/ m^3 , is insufficient to meet the full costs of O&M. DWR estimates that the collected fees cover about 20-30 percent of what is needed for O&M. There are proposals to increase the fee in the future to Som0.10/ m^3 , the estimate for full cost recovery of O&M, but any increase will have to be approved by Parliament. The mandate of DWR is not in accordance with its current funding base or the situation that is emerging at the field level as a result of the land reform process. The majority of the farms are small owner-operated units with typically less than 5 ha of irrigated land. It is difficult for DWR and the decentralized departments to administer water quotas and irrigation regimes to these units, which are a fraction of the size of the former state and collective farms.

40. The Republican Center for Land and Agrarian Reform is also part of MAWR and has dependent centers for land and agrarian reform (CLAR), in each oblast and raion. The principal functions of raion CLARs is to facilitate the land reform process. They are responsible for informing the farm population about its options, rights, and responsibilities resulting from land reform; for resolving conflicts over land and property shares; and for assisting in the formation of service enterprises using redistributed equipment and infrastructure. In addition, they are responsible for collecting the property debt of former state farms.

41. The State Agency for Land Registration, which was established in mid-1999 as the successor to the State Agency for Land Management and Land Resources, is an autonomous agency reporting directly to the Government. It is responsible for land registration, including the establishment and

¹³ TA 2450-KGZ: *Reorganization and Strengthening of the Ministry of Agriculture and Water Resources*, for \$1,324,000, approved on 23 November 1995; and TA 3035-KGZ: *Capacity Building in the Ministry of Agriculture and Water Resources*, for \$470,000, approved on 29 June 1998.

operation of a national registration system, demarcation of land boundaries, issuance of ownership certificates as well as other aspects of land management.

42. The development of advisory services is crucial to the development of agriculture, particularly in view of the limited experience of many farmers. The World Bank and the International Fund for Agricultural Development (IFAD) are supporting the development of the Rural Advisory and Development Service Foundation (RADS). RADS commenced in 1998 and has expanded to most oblasts. Advisory services are being established at oblast and raion levels with a steering council as the national apex body and a secretariat as the executive body providing coordination and management of the daily activities.

43. The Department of Agriculture at the oblast level is principally responsible for the coordination of agricultural activities, implementation of agricultural reforms, and preparation of regional agricultural plans, which largely follow farmer production projections. The department is staffed with about nine technical staff. The Department of Agriculture at the raion level usually comprises about five staff whose main task appears to be the (i) facilitation of credit by acting as intermediaries between farmer and credit suppliers, and (ii) the formation of groups.

44. The oblast DWR has a comprehensive role in the administration of irrigation water, including the operation of the main system and reservoir; design, construction, and rehabilitation of canals and structure; drainage and land reclamation; establishment and administration of water quotas; control of the irrigation system; and selling water to farms. There are 1,309 employees in Chui Oblast. The raion DWR is responsible for coordinating all government activities at the local level, including irrigation water management and negotiation of water supply contracts. The raion officers report to the oblast DWR. Each raion has a small staff of administration and specialists (about 7) and a larger staff of laborers including water masters or ditch riders (about 130).

45. Village governments have mixed roles and functions and include (i) administration of schools, clinics, and social services devolved from the former state and collective farms; (ii) collection of water fees; (iii) administration of irrigation; (iv) administration of land under the State Land Fund; (v) involvement in the privatization of farms; (vi) provision of some veterinary services; and (viii) control over national use of farmlands.

46. The number of farmer organizations is increasing. As part of ADB's TA,¹⁴ support was given to develop the legislation for WUAs and establish three trial WUAs. There are about 311 WUAs in the country with 77 in Chui. Only a small number are registered as legal entities. WUAs participate in the operation of the drainage and irrigation network; manage water resources; and execute hydraulic, reclamation, water conservation, and other activities. WUAs have the right to execute contracts.

47. It is intended that registered WUAs assume ownership of the irrigation infrastructure within the boundaries of the former large farms. However, most WUAs in Chui are not legally registered, and the irrigation infrastructure has yet to be transferred to those that are registered. WUAs have been reluctant to register because of the time-consuming process involved and also the liability in assuming ownership of the irrigation infrastructure, which is usually in disrepair. In the medium term, however, farms have a clear choice: either they organize themselves and assume responsibility or the infrastructure will eventually collapse.

48. DWR and its dependent departments at oblast and raion levels will play the major role in facilitating the formation and ensuring the sustainability of WUAs. However, WUAs take several years to develop and stabilize into organizations that are financially sustainable and capable of carrying out a systematic program of water distribution, fee collection, and O&M.

¹⁴ TA 2451-KGZ: *Building Capacity for the Formation and Management of Water Users Associations*, for \$861,000, approved on 23 November 1995.

3. Rural Finance

49. Following the liquidation of the former state agricultural bank (Agroprombank) and the ending of directed credits, rural financial services are being rebuilt to serve the needs of a market economy. Budgetary credits have been substantially reduced and will be discontinued in 2000. The principal sources of rural and agriculture sector finance include the Kyrgyz Agricultural Finance Corporation (KAFC), credit schemes supported by bilateral sources, prefinancing of crop production by traders and agribusiness, credit unions and associations, and nongovernment organization credit activities.

50. KAFC is an important source of finance. It provides three credit lines: (i) for agroprocessing and marketing, with loans of up to Som5 million; (ii) for medium and large farms, with loans of Som20,000-Som1.5 million; and (iii) for Small Farmers Credit Outreach Program, with loans up to Som20,000, on a group basis. KAFC's loan portfolio in Chui as of September 1998 was Som24.7 million for categories (i) and (ii), out of a total Som69 million for the whole country. Category (iii) loans were Som3.4 million in Chui and Som16.7 million nationally. Loans are generally lent at an interest rate of 28 percent annually. National level loans under categories (i) and (ii) were provided for livestock (37 percent), crop production (25 percent), mixed farming (5 percent), and processing (33 percent). For category (iii), 70 percent of loans were for crop production, and the rest largely for livestock production. KAFC application procedures are considered lengthy and burdensome, especially in establishing creditworthiness. Credit unions are not yet a significant source of rural finance. Under the ADB-funded project (footnote 14), about Som470,000 had been disbursed in Chui Oblast and Som3.3 million nationally as of September 1998. Other sources of credit include the Farm Development Fund administered by KAFC, and Mercy Corporation.

D. Government Policies and Plans

51. The Government's current policies and plans are contained in its Public Investment Programme Review and Update for 1997-99,¹⁵ which was accepted at the Consultative Group Meeting in October 1996. The six main strategies in the document aimed at supporting economic recovery and growth and providing for the basic institutions and public services of a modern state: (i) modernize infrastructure to support a modern market economy, (ii) sustain existing infrastructure in support of economic recovery and maintain essential services, (iii) support financial recovery in the agriculture sector, (iv) ameliorate adverse environmental legacies, (v) invest in the recovery of the industrial enterprise sector, and (vi) support policy and institutional reforms necessary to facilitate economic growth and development.

52. The Government has adopted five policy objectives for the agriculture and natural resources sector: (i) establish an incentive framework for the sector through promotion of competitive input and product markets; (ii) establish efficient farm units through the completion of land reform, farm restructuring, and creation of a land market; (iii) complete the privatization of agribusiness and agroprocessing industries; (iv) ensure the availability of seasonal and medium-term credit; and (v) ensure the sustainable management of natural resources.

53. The Government has also prepared a draft National Program of Agricultural Development in the Kyrgyz Republic for 2000-2010. This program has three main aims: (i) ensure food security and meet a minimal level of consumption of agricultural products, (ii) provide the processing industry with agricultural raw materials within the funding provided, and (iii) enhance agricultural export potential on the basis of existing agreements and contracts.

54. The Government is currently decentralizing important functions to the local government level, including tax collection, local expenditures for social services, and maintenance of public infrastructure. A system of intergovernmental finance is being developed.

¹⁵ Prepared by the State Commission on Foreign Investment and Economic Assistance in September 1996.

55. The Government has recognized the importance of the poverty situation by declaring 1998 as the Year of Rural Development and Poverty Reduction, and continues to take steps to reduce the level of poverty. The Government's Poverty Alleviation Program has been developed within the framework of sustainable human development. The main thrust is on pro-poor economic growth as the enabling environment for poverty reduction. It is recognized that growth has to be pro-poor, expanding opportunities for the poor to participate in the new forms of organization of production and ownership of assets. The expansion of employment opportunities, productivity, and wages and incomes of the poor are essential for rural poverty reduction. The Government has emphasized the following aspects: (i) special efforts to strengthen the agriculture sector, (ii) ensuring access to basic services, (iii) strengthening the social safety net, (iv) employment promotion and effective labor markets, (v) peoples' participation, and (vi) institutional integration of poverty into policy making.

E. External Assistance to the Sector

56. Development finance is playing a major role in providing assistance to develop the agriculture sector. The agencies involved include ADB, World Bank, European Union Technical Assistance for the Commonwealth of Independent States (EU-TACIS), EU Food Security Program, IFAD, and several bilateral sources.

57. ADB assistance to the agriculture sector has included an agriculture program loan and related TA. Under the Agriculture Sector Program, ADB has assisted the Government's reform program in moving the agriculture sector to a market-based system through measures to support land reform and farm restructuring, water rights management and user contributions, privatization of input supply enterprises, social protection, environmental protection, and institutional capacity building and restructuring. In addition to supporting the activities under the Agriculture Sector Program, TA 2450 (footnote 13) established the foundations for reorienting MAWR to clearly identify its role and functions, and undertake effective public sector planning and investment implementation. TA 2450 was followed by TA 3035 (footnote 13), which is continuing to build on the efforts of TA 2450. TA 2451 (footnote 14) established the legal framework for WUAs, instituted three pilot associations, and increased the awareness and support for the concept of participatory management of irrigation. ADB has also provided assistance for the Rural Financial Institutions Project,¹⁶ which is supporting the nationwide development of a credit union system. Through this project, credit unions are being established and savings and credit services for rural areas are being expanded. The Project aims at building on these former and ongoing activities.

58. The World Bank has provided support for structural reforms in the Privatization and Enterprise Adjustment Credit and the Agricultural Privatization and Enterprise Adjustment Credit. In addition, it has financed several investment projects: (i) the Rural Finance Project (RFP), (ii) the Sheep Development Project (SDP), (iii) the Irrigation Rehabilitation Project (IRP), and (iv) the Agricultural Support Services Project (ASSP). Preparation of the On-Farm Irrigation Project is under way. The SDP and ASSP are being cofinanced by IFAD. Other agencies are supporting projects providing grant funds, mainly for technical assistance: United Kingdom Know-How Fund for the ASSP land and agrarian reform, agricultural market information system, and rural advisory and development service components; EU-TACIS for RFP and the ASSP seed industry development component; and the Swiss Agency for Development and Cooperation for RFP and ASSP rural advisory and development service component. All are nationwide projects with activities in Chui Oblast.

59. Other assistance, ongoing or planned, that will directly or indirectly interface with the Project include a pilot on-farm irrigation project funded by FAO, an Indian Government-funded dairy plant, a land registration project to be funded by the World Bank, and a national irrigation rehabilitation action plan funded by EU-TACIS and the World Bank.

¹⁶ Loan 1529-KGZ: *Rural Financial Institutions*, for \$12.5 million, approved on 21 August 1997.

60. The Project will work closely with other projects with activities in Chui. During project preparation, detailed discussions were held with staff of the ASSP, as the Project will provide additional RADS staff for Chui; the RFP, with a \$10 million credit line for investment finance to be channeled through KAFC; and the IRP, as the Project will endeavor to work in those areas in Chui where the IRP is rehabilitating dams and primary canals. Particularly close cooperation has been maintained with World Bank staff preparing the On-Farm Irrigation Project. This cooperation has included the proposed establishment of a single project implementation unit in DWR, joint discussions with the Government on the cost-sharing arrangements for the rehabilitation of drainage and irrigation infrastructure, and agreements on approaches to the establishment of WUAs.

F. Lessons Learned

61. In the agriculture sector in the Kyrgyz Republic, ADB has implemented two projects. The first was the Agriculture Sector Program loan. The lessons learned include (i) ensuring Government ownership of the policy reform agenda and commitment to its implementation; (ii) a realistic assessment of institutional capacity within the implementing agency to develop and support policy reform; and (iii) sound policy analysis before policy reform and provision of external expertise where the capacity for policy reform is lacking within an institution.¹⁷ The second project is the Rural Financial Institutions Project. This project has progressed satisfactorily and produced some important lessons: (i) capable local management staff is required in addition to international support to ensure that effective implementation of the project is on a viable and sustainable basis; (ii) the Government's reluctance to borrow for consulting services (despite \$2.6 million for consulting services, the Government has not drawn down any funds and instead negotiated with Gesellschaft fur Technische Zusammenarbeit for grant financing) can jeopardize effective implementation; and (iii) agencies tend to expand too rapidly and overstaff office administration.

62. Several lessons can also be drawn from the World Bank implementation of three projects (SDP, IRP, and ASSP) in MAWR: (i) financial management systems should be transparent and in place at the earliest possible time; (ii) project design undertaken in rapidly changing circumstances and with limited reliable information needs a flexible process approach to implementation; (iii) lack of experience in project management, often accompanied by poor interaction with foreign technical assistance, can contribute to lack of flexibility and slow implementation; (iv) there is often Government interference in the recruitment of domestic consultants and other support staff; (v) the capacity of both central and local government administrations is very weak and underresourced; and (vi) there is inadequate understanding of the need for or a reluctance to ensure the participation of all stakeholders, particularly beneficiaries in implementation.

63. A recent ADB study¹⁸ reviewing postevaluation reports of agriculture and social infrastructure projects identified several key lessons: (i) borrowers' performance in terms of a favorable policy environment, commitment to the project, and provision of domestic funds is critical; (ii) the ability of the executing agency to supervise project implementation and properly utilize facilities, and its commitment to maintenance and repair must be ensured; and (iii) consulting services during implementation should be adequate. The implications drawn from the study are that (i) there should be a more realistic assessment of the macroeconomic and policy constraints, and interventions identified must be those that best fit the constraints; and (ii) in countries where the policy framework is distorted and the implementation environment is weak, necessary advisory and capacity-building TA services should precede lending activities, and such services should not be attached to loans.

¹⁷ PCR:KGZ: Agriculture Sector Program (in publication).

¹⁸ INII-99. *Special Evaluation of Factors Affecting Project Performance in the Agriculture and Social Sectors: A Review of Postevaluation Reports between 1991 and 1997*. 13 January 1999.

64. ADB has considerable experience in drainage and irrigation projects. An ADB study has identified several lessons for the design of projects:¹⁹ (i) improve the analysis of socioeconomic, cultural, and institutional conditions and involve project beneficiaries in planning, design, implementation, and management; (ii) ensure that a conducive policy environment exists; (iii) pay greater attention to institutional support and capacity-building activities; (iv) develop more effective arrangements for monitoring and evaluation; (v) develop a more integrated approach to water resources development; (vi) introduce a more multidisciplinary approach to supervisory missions; and (vii) recognize that implementation and O&M constraints are exacerbated for larger systems; and design such systems accordingly.

65. These lessons have been incorporated directly into the design of the Project.

G. ADB's Sectoral Strategy

66. ADB's country operational strategy emphasizes (i) support for the Government's reform activities and strengthening of its development management; (ii) encouraging the creation of a new structure for output and capacity by the private sector through investment and job creation; and (iii) arresting the rapid deterioration in the long-term potential of the country by investing in physical infrastructure and human resource development, and also by selective interventions to protect and rehabilitate the environment. Within this strategic framework, ADB's program in agriculture requires an integrated mix of policy reform, capacity building, and selective key investments.²⁰ The proposed Project focuses on investment with some capacity building. The Project is consistent with the country operational strategy and ADB's strategic development objective of economic growth. The Project also meets the operational priorities of the Government.

H. Policy Dialogue

67. Since the Kyrgyz Republic became a member of ADB in 1994, ADB has maintained continuous dialogue with the Government on its general reform program for the transition and on the agriculture sector specifically. ADB's Agriculture Sector Program loan provided the basis for policy dialogue. In addition, TA 2450 (para. 36), and subsequently TA 3035 (footnote 13) and TA 2451 (footnote 14) have enabled ADB to dialogue on key issues such as governance and institutional development; and the legal, policy, and institutional issues relating to the formation and management of WUAs. During project preparation, discussions continued on cost recovery for the O&M and investment rehabilitation of on-farm drainage and irrigation, coordination with other development activities, and institutional development.

68. The dialogue on cost recovery between the Government, ADB, and the World Bank resulted in agreement that farmers through membership in registered WUAs will meet full O&M costs within three years of rehabilitation of the on-farm drainage and irrigation system. For recovery of the investment costs for on-farm drainage and irrigation, it was agreed that 25 percent of the investment cost will be recovered. The exact terms and conditions of this cost-sharing arrangement will recognize the need for farmers to give priority to borrow working capital for farm operations, and meet the full O&M costs. It was agreed that the terms and conditions set for the commencement of the Project will be reviewed at least annually during the course of implementation, and changes made, if necessary, appropriate to the ability of WUAs to meet the payments. It has been agreed that WUAs will commence payment of their contribution after the completion of rehabilitation, but will have a four-year grace period over a seven-year term. The interest rate will be no more than the rate of inflation.

69. The Government strongly requested and supported discussion with ADB and the World Bank on avoiding duplication and maximizing the level of coordination and cooperation with other

¹⁹ Postevaluation Office. 1995. *Sector Synthesis of Postevaluation Findings in Irrigation and Rural Development Sector*. Asian Development Bank, Manila.

²⁰ STS: KGZ 96029: *Country Operational Strategy Study, Kyrgyz Republic*, December 1996.

development activities. The results of this dialogue have resulted in a high level of cooperation as described under the section on external assistance.

70. ADB continued discussions on governance and institutional issues. In particular, the focus was on continuing to reorient MAWR and especially DWR to more effectively manage one of the country's most important assets, water resources. As with other ministries and departments, DWR has limited resources to effectively manage, operate, and maintain the resource and associated infrastructure. However, while the Government is prepared to borrow to rehabilitate the system, it remains reluctant to borrow for the technical assistance required to reorient DWR to more effectively manage the asset.

IV. THE PROPOSED PROJECT

A. Rationale

71. Agriculture is the leading sector of the economy. The development of agriculture is a major priority for the Kyrgyz Republic, and the sector is expected to lead in the recovery and future growth of the economy.

72. The crop, livestock, and agro-industry subsectors continue to experience substantial adjustments. While sector reforms are continuing, progress in their effective implementation in the oblasts has been variable. Despite the upturn in performance in recent years, the sector is performing substantially below its potential, as farms, agro services, and agroprocessing neither are operating efficiently nor are they financially viable. Among the reasons for this underperformance are the following:

- (i) limited budget resources that constrain the development of the institutional capacity to provide the support needed by the emerging market-based agriculture;
- (ii) limited use of cash and the subsequent dependence on barter trading, particularly the use of wheat for the payment of taxes, social fund payments, etc;
- (iii) limited opportunities in both domestic and overseas markets and difficulty in identifying and accessing those that do exist;
- (iv) restricted access to inputs due to lack of creditworthiness and of credit funds to purchase inputs, and escalation in input prices relative to output prices.
- (v) limited access to farm machinery, particularly for small farmers, and the unreliable performance of machinery, which is generally outdated and obsolescent;
- (vi) irrigation systems that are in disrepair due to long-standing inadequate maintenance and rehabilitation, and that require adaptation to the emerging dramatically changed farming structure;
- (vii) limited access to working capital and limited availability of and access to investment capital because the farms lack creditworthiness and collateral;
- (viii) land reform and farm restructuring resulting in farms that markedly differ in size, ownership structure, and farm management practices, rendering many of them either nonviable or unprofitable. Most farms are not stable entities legally, technically, financially, or socially. Many large farms maintain social objectives in supporting large populations on the farm, while some small individual and peasant farms maintain a purely subsistence level of existence;
- (ix) land degradation and soils characterized by a continuing decline in fertility and soil structure due to unsustainable agronomic practices; waterlogging, salinization, and

increased alkalinity due to overirrigation and drainage problems; and soil erosion due to flood/border irrigation in unsuitable areas with inappropriate gradient and soil structures;

- (x) continuing change in the ownership structures of farms, a general lack of farm management and business skills, and poor farm management practices employing low and often inappropriate technologies;
- (xi) low level of awareness of rights and opportunities among landowners, accompanied by inadequate level of knowledge and understanding in the Government, which further diminishes at the lower levels. While there have been extensive reforms in agriculture, implementation at the farm level is highly variable;
- (xii) with the abolition or privatization of State agencies, the market's slowness in filling the gap in the face of negative or low farm profitability, lack of financing, and the associated prevalence of barter trading; and
- (xiii) lack in both the public and private sectors of management and manpower skills and experience appropriate to building and operating a market-based system.

73. The Government is pursuing a process of decentralization and has devolved many responsibilities to the oblast, raion, and village administrations and farm-level institutions, which lack the necessary capacity and resources to perform their functions adequately. As the implementation of many aid-assisted projects is focused at the oblast level, the oblast and raion administrations need to be strengthened both to coordinate project support and deliver the services necessary for the effective implementation of these projects. Support for this will be given through the TA.

74. The Government has recognized the need for a more concentrated and coordinated focus on key constraints at the local administration and farm levels to bring together ongoing and planned project investments and enhance their impact, address the remaining constraints, and actively involve the private sector in providing key services. In particular, a regional or area-focused approach is essential to ensure the effective implementation of projects at the oblast level, and to identify the remaining constraints and opportunities not being directly addressed—such as restructuring and commercialization of selected farms, improved access to inputs and marketing, rural infrastructure, institutional development, and policy and legal issues—to provide an environment conducive to the functioning of a market-based agriculture system. At the same time, linkages between public sector investment and private sector initiatives in various business activities need to be established.

75. Chui was selected as the project area because of its significant economic potential: (i) the oblast accounts for the largest share of agriculture, with over 30 percent of the country's agricultural land; contributes about 30 percent of agricultural production, has 30 percent of irrigated lands, and is favorably located in relation to the major domestic as well as northern export markets; (ii) the land and agrarian reform process while slower than in other regions is now progressing more rapidly; Chui, therefore, provides an important opportunity to intervene strategically in the ensuing farm reorganization process to eliminate some of the problems encountered in other oblasts (land and farm fragmentation) and to ensure that viable farms emerge out of the process; and (iii) it is located close to Bishkek, thus facilitating the development of the necessary institutional strengthening linkages.

76. The Project represents a significantly different approach from that in earlier and ongoing assistance to the agriculture sector. Generally, assistance by major funding agencies has been through projects with a national coverage, supporting public sector infrastructure and services. This Project is geographically focused on Chui Oblast and on private farms and agribusiness and attempts to build a partnership between public and private investment that is essential to achieve agricultural growth.

77. There is an opportunity to adjust the pattern of agricultural activity away from the concentration on a few basic low-value staple food crops with very limited scope for economic growth. This means moving away from the concept of domestic self-sufficiency in basic foods, inherited from the command economy and reinforced by postreform concerns about food security, toward a strategy based on comparative advantage and maximizing incomes to achieve self-reliance. Current agriculture sector strategies place far too much emphasis on self-sufficiency. Chui has the potential to be a major agricultural exporter provided farmers are encouraged to adjust and take advantage of market opportunities and new opportunities that become available to them.

78. Experience over the past few years, both nationally and in Chui, has demonstrated that improving farm productivity is not simply a matter of access to credit with which to buy inputs. Increasing productivity in arable farming in the oblast, as elsewhere in the country, requires the application of a cost-effective package of technology in a timely manner. Simply applying fertilizer or agrochemicals in isolation without attention to seed quality or water management will have little impact on productivity or profitability. It is clear, also, that investment in irrigation facilities without attention to farm development may safeguard the existing level of production but will do little or nothing toward improving farm productivity.

79. The challenge is to link the integrated package of interventions under the Project with initiatives under current and planned national projects into a coordinated agricultural development program to provide the key investment needs and related organization/enterprise support required across the sector from production to marketing. The Project will focus on key constraints to farm productivity and profitability that can be addressed immediately and effectively in the current environment.

B. Objectives and Scope

1. Objectives

80. The long-term development goal of the Project is to increase the incomes of farmers in Chui. The immediate project objective is to increase farm productivity and profitability in selected areas.

2. Project Area

81. Within Chui, the Project will focus on areas that coincide with the boundaries of the former state and collective farms (hereafter referred to as former large farms).²¹ Emphasis will be given to working with clusters of former large farms, not necessarily contiguous, in the same general area, rather than selecting a large number of individual sites. About 20-30 former large farms are expected to be involved in the Project.

82. The selection criteria for identifying suitable former large farms are as follows:

- (i) The farm has access to marketing and processing opportunities;
- (ii) Irrigation and drainage rehabilitation costs are small;
- (iii) The farm debt is manageable;
- (iv) Farmers are willing to incorporate and develop a sound ownership structure;
- (v) The farmers are prepared to develop business plans for agriculture and related activities;
- (vi) The enterprises are, or can become creditworthy;
- (vii) The majority of the farmers are willing to participate in the Project;
- (viii) The management and operation of farms, particularly the unified peasant farms, are not subject to interference from local government; and
- (ix) The farm is close to other participating farms.

²¹ The former state and collective farms represent the boundary of on-farm irrigation in the former system. They provide the most workable unit area for initial activities and the establishment of WUAs.

83. With the selection criteria identified, participation will depend on the demand, capability, and willingness of farms and enterprises. The project client base will comprise individual farms, peasant farms, cooperatives and associations of peasant farms, and unified peasant farms. The following approach will be adopted for identifying and selecting the farms:

- (i) All former large farm areas will be broadly ranked on the basis of the extent of their drainage and irrigation rehabilitation requirements and 50 farms will be identified;
- (ii) These 50 farms will be further classified according to the other selection criteria and grouped accordingly into clusters;
- (iii) One or two clusters will be selected for implementation in the first two years of the Project; and
- (iv) A publicity campaign will be launched in these cluster areas to inform the farmers of the intentions of the Project and assess their likely participation.

3. Scope

84. The Project comprises four components: (i) farm development, (ii) drainage and irrigation, (iii) development of private sector marketing and input supply services, and (iv) project management.

a. Farm Development

85. The process of land and agrarian reform broke up the former large farms into various structures. The most common immediate outcome is a substantial part of the former large farm remaining intact as a unified peasant farm. Such farms account for about half the land area. The remaining area is occupied by a large number of smaller individual and peasant farms, sometimes amalgamated into peasant associations. The unified peasant farms retain the former system of management and continue to provide the village with the many social and other services earlier provided by the former large farms. Most farms, both large and small, operate at or close to subsistence level, are not currently financially viable, are consuming capital assets including machinery and irrigation systems inherited from the Soviet period, and are unstable in structure, size, and number of participating landowners.

86. The Project will support the restructuring and registration of farms as legal enterprises. A public information campaign will be undertaken at the outset of implementation. It will inform the potential farm beneficiaries in Chui of the objectives and scope of the Project, the support to be provided, and the conditions for participation. Following the identification of former large farms, an initial comprehensive participatory survey of each selected farm will be undertaken by a full-time farm development team comprising a farm management specialist, irrigation engineer, sociologist, and staff from CLAR and RADS.

87. The initial comprehensive assessment will (i) review the current situation to obtain an understanding of the institutional, social, economic, and agricultural environment; (ii) determine the scope, willingness, and ability of farmers to participate effectively and benefit from the Project; (iii) facilitate the preparation of a strategy to address the key constraints such as farm structure, farm organization, business management practices, marketing, input supply, machinery hire services, credit, drainage, and irrigation for various farm groups; (iv) facilitate the identification of training needs and approaches to providing basic training to farmers in the development of legal enterprises, farm management, farmer organizations, business enterprise development, etc; and (v) provide baseline data for monitoring the effects and impact of the Project and serve as the basis for the establishment of an annual survey of farms. Special consideration will be given to farms that have been privatized and operate independently of the remaining unified peasant farms and to the options that are

available for restructuring unified peasant farms into commercially viable farms. The Project will encourage and facilitate the registering of the farms as legal enterprises, which is essential to ensure the landowner's commitment to the farm, farm ownership of land, and to provide an adequate basis for transacting business with private service providers. Registration as a legal enterprise will be a prerequisite for full participation and support under the Project.

88. The availability and reliability of statistical information on farms have diminished substantially with the breakup and privatization of the former large farms and the limited resources of the Government. Improved information is essential for farm planning, and monitoring of impact, and to provide a real and quantitatively reliable understanding of the situation in the agriculture sector. The Project will introduce modern well-proven procedures for data collection and analysis. It will establish an annual survey of farms, initially focusing on farms participating in the Project but extending it to sample the whole oblast. The initial comprehensive survey of former large farms will provide the basis for the establishment of a formal annual survey and for monitoring the impact of the Project.

89. To improve farm and business management practices, the Project will assess training needs and develop suitable training programs, including the provision of all materials and training of local trainers to conduct the program. The local trainers will be from the Agrarian Academy, agricultural colleges/technicums, and RADS. To enhance the training capability, training will include training the trainers in local institutions, through links to a specialized foreign institution that will provide training in improved farm management and farm business development. There will also be some overseas training. This activity will include enterprise development training. All training programs will be evaluated and refined to meet the needs of the participants.

90. The farm development component will also assist farms and businesses to operate on a commercially viable basis. Through international and domestic consultants, the Project will facilitate the preparation and use of business plans by farms and business enterprises. RADS consultants will also work with farmers and entrepreneurs to prepare their own business plans. As part of this process, farms and business enterprises will be encouraged and assisted to establish appropriate accounting, information technology, and management arrangements. To assist farms and businesses to develop and implement their plans the Project will facilitate access to working capital and investment loans. International and local consultants and RADS consultants will work with farmers and entrepreneurs to meet the requirements of KAFC or other financial intermediaries to access the appropriate working capital and investment loans.

91. Under this component, the Project will finance training, local farm management specialist and farm advisory consultants (as part of RADS), furniture and equipment, and operating costs. KAFC from its own resources will provide credit for working capital estimated at \$3.5 million equivalent over the project period.

b. Drainage and Irrigation

92. Drainage and irrigation are fundamental to agriculture in Chui but the system has deteriorated significantly in recent years for lack of repair and maintenance. The Project will rehabilitate essential off-farm and on-farm infrastructure, and ensure the effective functioning of systems serving the 20-30 former large farms to be included in the Project.

93. The Project will rehabilitate and improve the existing drainage infrastructure. In particular, it will provide for the (i) rehabilitation of drainage infrastructure (open and closed drains) on about 24,000 ha thus directly benefiting some 55,000 ha of irrigated land; (ii) rehabilitation of open main collector drains (<1,000 km) indirectly benefiting an additional 106,000 ha of irrigated land; and (iii) development of technical packages to test shallow field drains and vertical pumped drainage wells for drainage and irrigation, and the establishment of a computerized database.

94. The Project will also rehabilitate and improve the existing irrigation infrastructure. In particular, it will provide for the (i) rehabilitation of 55,000 ha of irrigation infrastructure; (ii) completion and adaptation of irrigation infrastructure serving the same area; and (iii) assistance to WUAs for field-level improvements in water distribution through the construction of new channels, and control and flow-measuring devices.

95. The Project will also improve farm-based land management practices and erosion and soil protection measures. The use of low-input and low-energy technologies in land management will be introduced to improve soil moisture retention on sloping lands and reduce the rate of soil erosion. Sloping agricultural land technology (SALT) and low-cost drainage techniques will be considered.

96. The off-farm drainage and irrigation rehabilitation will commence only after agreement has been reached with farmers/WUAs on their full participation in the Project. Funding for these off-farm works will be financed as a public sector expenditure with no cost recovery from farmers. Each drainage and irrigation rehabilitation design will be subject to review by the Ministry of Environmental Protection (MEP).

97. The on-farm irrigation works will be undertaken following agreement on the establishment of a WUA, and the completion of at least one cycle of training in the management and operation of a WUA; and agreement to accommodate and pay full O&M costs. As farmers cannot afford full payment of O&M immediately, this would be phased in over a period of two to three years. In addition, farmers will have to contribute 25 percent of the rehabilitation costs of the on-farm drainage and irrigation.

98. DWR will be responsible for the establishment of WUAs. It has already commenced in Chui Oblast, and elsewhere with the support of the World Bank, building on the results of the ADB-funded TA 2451 (para. 46). DWR will receive support to establish WUAs on a nationwide basis under the forthcoming On-Farm Irrigation Project to be funded by the World Bank.

99. The establishment of WUAs will not be undertaken directly under the Project. However, the Project will provide training in WUA formation and management and on-farm water management, including some overseas training to supplement the expected World Bank activities nationwide. In addition, overseas study tours will expose selected DWR staff to management of water resource institutions in other countries with a similar environment and irrigation system.

100. Under this component, the Project will finance the rehabilitation of the drainage and irrigation infrastructure, procurement of vehicles and equipment, local and overseas training and study tours, and international and domestic consultants.

c. Development of Private Sector Marketing and Input Supply Services

101. The privatization process resulted in the dismantling of State agencies and enterprises responsible for produce marketing and processing, and the supply of inputs. Private traders have been slow to fill this gap. The vast majority of farms produce a narrow range of products, do not have adequate access to markets, and are not organized to find and access markets. Farmers, especially those with smaller farms, need to cooperate to develop a strategy to identify and access markets. Increasing farm production, productivity, and profitability will depend on linking farms to improved private cold storage and processing facilities combined with the diversification of production into higher value products of higher quality. This will add value and facilitate access to the middle and upper end of the domestic market where there is strong competition from higher quality imports, and to the export market for both fresh and processed food. In the case of input supplies, the main private sector suppliers operate on a relatively small scale and have not developed extensive local networks because the level of effective demand is low. Inputs, while available, are not readily accessible to all farmers, particularly the smaller individual and peasant farms.

102. The Project will support the establishment of agribusiness enterprises for input supply, marketing, and other services, including machinery hire. Interested groups of farmers/entrepreneurs willing to form enterprises for input supply, marketing, and other services will be identified during the initial comprehensive farm survey. Specific training will be provided to enable farmers/entrepreneurs to understand and effectively finance, manage, and operate such enterprises. The enterprises will be registered as legal entities. In particular, the Project will promote the development of enterprises to meet the raw material standards and requirements of processors in both the Kyrgyz Republic and overseas. Specifically, farmers/enterprises will be encouraged and assisted to identify and supply specific agribusiness outlets. Initially the focus will be on commodities for which market opportunities have been identified (and where, earlier, a comparative advantage had been demonstrated) including milk, oilseed, sugar beet, and fruit and vegetables. During implementation, market opportunities for other commodities will be investigated for possible support. Enterprises will be supported with training and assisted to access medium-term credit through KAFC to purchase equipment to improve their marketing capability. The Project will also support the development of associations and enterprises to purchase inputs in bulk, distribute them to members, and cover the costs of transport, storage, and administration. The formation of enterprises and subsequent support will be undertaken by domestic enterprise development consultants (as part of RADS), initially supervised by international consultants.

103. Many emerging farms face considerable difficulty in accessing appropriate and timely machinery services. Very few small farms own equipment and are often dependent on larger farms for machinery hire services. Much of this equipment is too large for small farms. The Project will increase the availability of and access to appropriate machinery services. New groups/individuals wanting to establish machinery hire service arrangements will be identified as part of the initial farm survey. The project management team will assess all proposals for support. This assistance will include training, help in the registration of these enterprises as legal entities, linkages to KAFC for credit to procure machinery and equipment, and assistance to manage and operate services on a fully commercial basis.

104. It is expected that the enterprises supported under this component will be principally from or directly support farms in the targeted areas; however, suitable viable enterprises supporting other farming areas will not be excluded. In addition, the focus will be on the establishment of new enterprises, but existing privately owned enterprises may also be considered for support.

105. The Project will support the development of market links through market studies of domestic and export markets for specific commodities; the establishment of linkages between farms, farmers associations, and local processing facilities and traders in the local and export markets; and the identification of other export crops for production in Chui Oblast.

106. Under this component, the Project will finance training, domestic enterprise development consultants, marketing studies, and a medium-term credit line of \$10 million for investment loans, which will be administered by KAFC on existing standard commercial terms and conditions. This credit line will be available also to farmers under the farm development component for investment loans.

d. Project Management

107. Project management will be conducted through existing institutions to build up sustainable institutional implementation capacity. Chui Oblast administration at present does not have the capability to implement an integrated project of this nature and substantial consulting services will be required to provide the necessary managerial, financial, and technical support for effective project implementation.

108. The Project will finance the project management unit (PMU) and part of the project implementation unit (PIU) in DWR as well as the international and domestic consultants, furniture and equipment, vehicles, and related operating expenses.

C. Cost Estimates

109. The total cost of the Project is estimated at \$45.0 million equivalent, including physical and price contingencies, interest during construction, taxes and duties, and expected contributions of participants. Of the total cost, about \$22.3 million or 50 percent is in foreign exchange cost, and \$22.7 million equivalent or 50 percent in local currency costs. A summary of the cost estimates is in Table 1 and detailed cost estimates in Appendix 2.

Table 1: Summary of Project Cost Estimates
(\$ million)

Item	Foreign Exchange	Local Currency	Total Cost
A. Base Cost			
1. Farm Development	3.6	3.1	6.7
2. Drainage and Irrigation	5.6	9.7	15.3
3. Development of Private Sector Marketing and Input Supply Services	8.4	3.8	12.2
4. Project Management	1.9	1.7	3.6
Subtotal (A)	19.5	18.3	37.8
B. Contingencies			
1. Physical Contingencies	1.4	2.8	4.2
2. Price Contingencies	0.5	1.6	2.1
Subtotal (B)	1.9	4.4	6.3
C. Interest During Construction	0.9		0.9
Total	22.3	22.7	45.0

D. Financing Plan

110. It is proposed that ADB provide a loan in the amount of \$36.0 million equivalent from its Special Funds resources, with an amortization period of 32 years, including a grace period of 8 years, with an interest charge at the rate of 1 percent during the grace period and 1.5 percent thereafter. The amount of the proposed ADB loan is 80 percent of the total cost of the Project and will finance \$19.5 million of the total foreign exchange, including the service charge of the loan during implementation, and \$16.5 million equivalent of local currency costs. The Government will finance \$7.5 million equivalent of total costs, including \$2.8 million in foreign exchange costs and \$4.7 million equivalent of local costs. The Government's contribution includes working capital loans from KAFC, which are expected to be used for the purchase of fuel, seed, fertilizer, and other farm inputs; O&M of off-farm drainage and irrigation; taxes; and duties. The remaining amount of \$1.5 million equivalent will be provided by the project beneficiaries for O&M of on-farm drainage and irrigation and credit fees (details in Table 2 and Appendix 2). In addition, WUAs will repay 25 percent of the investment cost for rehabilitation of on-farm drainage and irrigation. As these repayments will not be due within the implementation period of the Project, they are not reflected in Table 2.

111. The Borrower will be the Kyrgyz Republic and the foreign exchange risk will be borne by the Borrower.

Table 2: Financing Plan
(\$ million)

Source	Foreign Exchange	Local Currency	Total	Percent
Asian Development Bank	19.5	16.5	36.0	80
Government	2.8	4.7	7.5	17
Beneficiaries		1.5	1.5	3
Total	22.3	22.7	45.0	100

E. Implementation Arrangements

112. Given the complexity of the Project, the novelty of this approach in the Kyrgyz Republic, and the continuing changing nature of activities resulting from the transition process, there is a need to adopt a flexible approach. However, more flexibility will require a more concerted focus on monitoring and supervision of the Project by both the Government and ADB.

1. Project Management

113. The management arrangements for the Project comprise a project steering committee (PSC), Executing Agency, Implementing Agency and project management and implementation units. A chart depicting these arrangements is in Appendix 3.

114. The implementation of the Project will be guided by a PSC comprising the governor of Chui Oblast (chairperson); minister of MAWR (cochairperson); deputy minister/director of DWR; project coordinator; project director; and representatives from the Ministry of Finance, Goscominvest, MEP, farmers, private sector, nongovernment sector, ADB, and project manager (secretary).

115. The PSC will (i) provide guidance to the PMU on issues related to policy; (ii) monitor overall progress and activities to ensure that these remain consistent with the goals and objectives of the Project; and (iii) facilitate the coordination of activities between the Project and other projects. The PSC will meet monthly during the beginning of the Project and quarterly once the Project is well established, unless circumstances require more frequent meetings.

116. The Ministry of Agriculture and Water Resources is the proposed Executing Agency. MAWR will be responsible for the overall coordination of the Project and for (i) disbursing ADB loan proceeds (ii) keeping duplicate records on withdrawal applications and disbursements under the project accounts, (iii) submitting to ADB progress and other reports prepared by the PMU; (iv) ensuring timely submission of audited accounts of the Project to ADB, and (v) serving as the focal point for ADB's project review and administration activities and between ADB and COA. A project coordinator from MAWR will be appointed by the Government on a part-time basis. He/she will be responsible for overseeing the Project and will report directly to the minister on major issues.

117. The Chui Oblast administration will be the Implementing Agency. As such, COA is responsible for overall project implementation and will be the focal point for all project activities. To assist COA to manage the Project, the PMU will be responsible for day-to-day project implementation. The PMU will be headed by a project director on a part-time basis who will be nominated by the governor of Chui Oblast and approved by the PSC. The project director will not be involved in the day-to-day management of project activities, but will provide overall coordination. The project director will also be responsible for submitting reports on project progress and activities to MAWR and the PSC, and will report to the governor and project coordinator.

118. The PMU will (i) ensure that the Project is implemented in accordance with the design; (ii) ensure effective coordination of all activities and agencies involved; (iii) ensure compliance with environmental requirements; (iv) maintain appropriate accounts, including records on withdrawal applications and disbursements; (v) manage procurement in accordance with ADB guidelines; and (vi) prepare quarterly progress and other reports in formats agreed upon with ADB.

119. The PMU will be managed by a local project manager who will serve full-time on the Project and will coordinate day-to-day activities. The PMU will be staffed by a team of international and domestic consultants, who will report to the project manager. The application for withdrawal of loan proceeds will be prepared by the PMU; signed jointly by the project manager, project director, and the project coordinator; and submitted to MAWR for necessary action. The PMU in Chui will be responsible directly for the implementation of farm development and the development of private sector marketing and input supply services components, and indirectly for the drainage and irrigation component, which will primarily be the responsibility of the DWR/PIU.

120. Up to 20 domestic consultants will be financed under the Project. About 15 will be farm advisory consultants working through RADS and reporting to the local farm management adviser, who in turn will report to the regional manager for RADS in Chui. Five domestic consultants will be enterprise development advisers who will work with the international enterprise development adviser. It is envisaged that all 20 consultants will be absorbed into RADS. They will be appointed to specific farms/enterprises, participate in the initial comprehensive survey of each farm, work with the team to develop a strategy and work plans, facilitate the preparation of business plans for farms and business enterprises, provide continuing advice and follow-up support to participating farmers and enterprises, and facilitate the formation of farmer groups and enterprises and their development into registered legal enterprises. It is expected that other RADS staff will be rotated among the project farms to increase their level of experience and expand the benefits of the Project to RADS.

121. To facilitate a unified approach to the drainage and irrigation activities of the Project and of the World Bank's ongoing Irrigation Rehabilitation Project and the proposed On-Farm Irrigation Project, including the establishment of WUAs, the Government requested the establishment of a single PIU in DWR. A PIU already exists for the Irrigation Rehabilitation Project and comprises a project director, financial manager, accountant, procurement specialist, and engineers (3). Additional staff will be funded by the Project and the World Bank's On-Farm Irrigation Project to ensure that the PIU can adequately manage activities under both projects. The Project will provide international staff including a drainage/irrigation engineer, a contract specialist, and unspecified short-term assistance. A coordinator from COA will be responsible for overseeing the implementation of the drainage and irrigation component. The PIU will also serve as the base for a bid committee that will review, evaluate, and rank civil works and procurement proposals from private contractors. The bid committee will be composed of the PIU procurement specialist; PMU manager; WUA representative; and other representatives from Goscominvest, MAWR, COA, Chui Oblast DWR, and raion DWR. Oblast and raion irrigation staff will be contracted to provide the specific services required under the Project's drainage and irrigation component.

2. Flow of Funds and Onlending Arrangements

122. Apart from the medium-term credit line through KAFC, all loan funds will be provided as a grant to MAWR and COA. The Borrower will relend the loan proceeds to KAFC under a Subsidiary Loan Agreement at a floating rate that will be at least equal to the actual rate of inflation and will fully cover the cost of funding, administration, and the foreign exchange risk premium incurred by the Government. The repayment period will be 20 years including a grace period of 7 years.²²

123. The credit line will be onlent as investment loans to farmers and entrepreneurs. It is anticipated that the loans will provide on-farm investment for the development of agricultural

²² These are the same terms and conditions that apply to the current World Bank credit line to KAFC.

production, and investment for the development of input supply, machinery hire services, storage, packing, marketing, and related agribusiness and service enterprises. The subborrowers will prepare business plans and have commercially viable projects with adequate collateral and financial rates of return, a demonstrated repayment capacity, and a contribution in cash or in kind of 20 percent of the subproject costs. KAFC will onlend the credit line to eligible borrowers under separate loan agreements acceptable to ADB. The interest rate to borrowers will be a floating rate based on the cost of funding to KAFC, administration costs, and a risk premium, which will cover loan-loss provision. Loans to subborrowers will be made in som. The terms of the subloans will be up to 12 years inclusive of a grace period of 3 years. KAFC will have full authority in the selection of borrowers, approval of subloans, and determination of lending terms. KAFC will be required to submit to ADB for review the first five subloans and any subloan exceeding \$200,000 equivalent. The relending arrangements will be reviewed jointly by the Government and ADB every six months or as needed, and the arrangements adjusted accordingly.

3. Cost Recovery

124. The farmers through their WUAs will be responsible for sharing 25 percent of the investment cost for the rehabilitation of on-farm drainage and irrigation. The Government through the PIU will initially utilize loan funds to meet the costs of these activities. In determining the appropriate level of cost recovery, the Bank and the Government agreed that farmers should not be unnecessarily burdened with further debt, and that priority should be given to enabling them to borrow for working capital and investment and meet the full O&M costs. It is envisaged that farmers will commence paying their share of the investment costs two years after the rehabilitation of the system and will pay over seven years with a four-year grace period. It was also agreed that the cost recovery levels will be reviewed by the Government and ADB at least annually during the course of implementation.

4. Period of Implementation

125. The Project will be implemented over a period of six years from the time the Loan Agreement becomes effective, and the loan will be completely drawn down within seven years. Project implementation is expected to commence in early 2000. The project implementation schedule is in Appendix 4.

5. Procurement

126. Procurement under the Project includes procurement by subborrowers under KAFC credit and procurement by the Government of the goods and services needed for effective implementation. Subborrower procurement will cover agricultural inputs, farm machinery and equipment, equipment for storage and marketing of produce, etc. KAFC will require the subborrowers to (i) demonstrate that procurement procedures are appropriate in the circumstances; (ii) ensure the goods and services to be financed by such subloans will be purchased at a reasonable price, account being taken also of relevant factors such as time of delivery, suitability and reliability of the goods, availability of maintenance facilities and spare parts, and, in the case of services, their quality and the competence of the parties rendering them; and (iii) ensure and certify that all goods procured have satisfied ADB's country-of-origin and eligibility requirements.

127. Procurement by the Government will cover vehicles, furniture, equipment (including drainage and irrigation and communications equipment), and training. Procurement of ADB-financed goods and services will be carried out in accordance with ADB's *Guidelines for Procurement*. Equipment will be procured by international competitive bidding (ICB) for contracts valued at more than \$500,000; international shopping for contracts \$500,000 or less; and direct purchase, with prior agreement of ADB, for contracts valued at less than \$100,000. The Government has requested that civil works be carried out under local competitive bidding. The civil works will involve many small packages for simple rehabilitation and deferred maintenance, and it is unlikely that foreign contractors would be interested in bidding for such contracts. In addition, local contractors are available at reasonable cost,

and procedures used for domestic procurement are satisfactory. Indicative procurement packages are listed in Appendix 5.

6. Consulting Services

128. A total of 1,869 person-months of consulting services (120 international and 1,749 domestic) will be required for project implementation. The international experts and the length of their service (in years in parentheses) are as follows: farm management specialist (2), enterprise development specialist (1), agricultural marketing specialist (1), drainage/irrigation engineer (1.5), contract specialist (0.5), financial investment analyst (0.5), and unspecified short-term assistance (3.5). Domestic experts required are a project manager (6), accountant (6), farm management specialist (6), enterprise development specialist (5.25), agricultural marketing specialist (5), sociologist (3.5), 15 farm advisory consultants (43), 5 enterprise development consultants (17), engineers (30), and technicians (24). An international firm of consultants will be recruited in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements acceptable to ADB for the engagement of domestic consultants. Appendix 6 contains the required areas of expertise and terms of reference.

7. Disbursement Arrangements

129. An imprest account will be established at a bank to be agreed upon by the Government and ADB to facilitate the timely release of the loan funds. The initial amount to be deposited into the imprest account will not exceed the equivalent of \$500,000 based on an estimate of expenditure in the first six months of project implementation. The ADB's statement of expenditure (SOE) procedure will be used to reimburse eligible expenditures and to liquidate advances provided to the imprest account. The individual payments that may be reimbursed or liquidated under the SOE procedure will not exceed the equivalent of \$25,000. The imprest account and SOE procedure will be established and maintained in accordance with the *Loan Disbursement Book* and detailed arrangements between the Government and ADB. Through existing World Bank projects, the Executing Agency has gained considerable experience in operating imprest accounts and maintaining proper SOE records in accordance with internationally accepted accounting standards.

8. Accounts, Audit, and Report

130. The Government will (i) maintain separate accounts for the Project, and (ii) have such accounts and related financial statements audited annually by auditors acceptable to ADB and in accordance with the provisions of the Loan Agreement and as specified in the booklet entitled *Asian Development Bank's Financial Reporting and Auditing of Projects Financed by the Bank*. The imprest account and SOE records will also be audited as part of the annual audit. The Government will submit to ADB certified copies in the English language of such audited accounts and financial statements and the reports of the auditors relating thereto, within six months after the close of each financial year. For the purpose of complying with the requirement for annual audited financial statements, proceeds of this loan may be used to finance expenditure for private sector auditors and translations of auditors' reports into English.

131. MAWR will submit to ADB consolidated quarterly progress reports in the English language on all aspects of project implementation. The reports will include details on overall progress in implementation, problems/issues encountered during the reference period and measures taken or proposed to be taken to remedy these problems, and the proposed program of activities during the following quarter. Within six months after the closing date of the loan, MAWR will prepare and submit to ADB, in a format acceptable to ADB, a project completion report on the utilization and impact of the loan, performance of the Project, the economic and social benefits generated, and the impact on agriculture, particularly in Chui Oblast. KAFC will maintain separate accounts for the credit line and submit to ADB quarterly progress reports and audited annual financial statements.

132. The Appraisal Mission considers the Executing Agency's (MAWR's) capacity to coordinate the Project to be acceptable in view of the experience gained in implementing projects financed by the World Bank. The Implementing Agency (COA) is less experienced, but technical support will be provided by consulting services under the loan, and management and financial advice under the TA.

9. Project Performance Monitoring and Evaluation

133. An integrated system of data collection and analysis will be designed and implemented to monitor the progress in achieving the project objectives. The project performance monitoring system (PPMS) will provide the Government and ADB with the necessary data and tools to monitor project inputs, activities, outputs, and objectives as provided in the project framework; and to assess the technical, social, and economic aspects of the Project. The system will be implemented in COA and will be integrated with the proposed annual farm surveys. Support and advice on the establishment of the system will be provided by the TA. MAWR will submit to ADB a brief monitoring and evaluation report on project progress at the end of each project year.

10. Project Review

134. Semiannual reviews will be conducted in the initial years until ADB judges that an annual review will be sufficient for effective administration. In addition to these regular reviews, a comprehensive review of the Project will be carried out jointly by MAWR and ADB after 18 months and a midterm review at the end of the third year of the Project. These reviews will, among other things, assess the overall performance of the Project and the need for changes in its design and implementation arrangements.

F. Executing and Implementing Agencies

135. The Executing Agency is MAWR. MAWR is currently responsible for several large World Bank-funded projects and smaller bilateral activities. Senior staff in MAWR are familiar with the overall responsibilities of project coordination.

136. The agencies responsible for implementation are COA, DWR and KAFC. COA has no experience in implementing a project of this size and complexity. To support COA, a PMU will be staffed by international and domestic consultants, and advisory technical assistance will be provided for institutional strengthening in planning and managing agricultural development.

137. DWR is currently implementing the World Bank-funded IRP. A PIU has been established with domestic consultants and supported by an international firm of consultants. The PIU has established effective accounting and procurement procedures. Under the Project, the DWR PIU will be supported with additional consulting services for the drainage and irrigation component.

138. KAFC is the most significant financial institution that is lending predominantly to agricultural and rural enterprises. The World Bank has recently approved a second project for KAFC based on its performance in implementing the first project ahead of schedule. As part of the appraisal process, the National Bank of the Kyrgyz Republic conducted an assessment of KAFC and reaffirmed that KAFC fully complies with the relevant prudential guidelines and is in a sound financial condition.

G. Environmental and Social Measures

1. Environment

139. The Project is in environment category B. An initial environmental examination (IEE) was undertaken as part of the project preparatory TA and supplemented by the findings of the Preappraisal Mission. The summary IEE is a supplementary appendix. The IEE concludes that the Project will generate significant environmental benefits by reversing waterlogging, salinization, and alkalization trends on 161,000 ha. About 55,000 ha of irrigated land will benefit from improved on-

farm water management and enhanced water use efficiency. Irrigated land subject to severe erosion risk will benefit from the soil conservation activities.

140. Impacts on surface and ground water quantity/quality are considered minimal and will be monitored through established systems. Appropriate on-farm management and storage of fertilizers will also minimize such impacts. Pesticide contamination risks will be reduced through appropriate training and application within the context of a recently enacted legislative and enforcement framework governing agrochemical registration, procurement, selection, handling, and disposal. The Project will not have negative impacts on critical secondary wetlands or protected areas, as the affected land has already been converted to irrigated agriculture and is zoned for agriculture. To ensure environmental due diligence as required under the Kyrgyz Republic, each drainage/irrigation subproject will be subject to review following the Government's environmental assessment procedures. The review will cover open collector drains connecting the command areas to drainage outfalls. Rehabilitation of canals, ditches, and drains will be along existing rights-of-way. Irrigation and drainage engineering will be undertaken in conformity with internationally accepted standards. No loans for agroprocessing units will be provided by KAFC unless the borrowers submit permits granted by MEP. MEP will be a member of the PSC to ensure close cooperation on natural resource management and environmental matters.

141. Under the World Bank funded Rural Finance Project II, KAFC will employ an environmental officer as part of the loan appraisal process and train loan officers to ensure that loans comply with the applicable environmental regulations.

2. Social Analysis

142. The Project will have significant positive impacts on poverty reduction through support to improve agricultural productivity and increase farm incomes. At least 25 percent of the project beneficiaries are expected to be poor farming households, given the fact that approximately 27 percent of the population belongs to poor households. These farmers will benefit from support for WUAs for irrigation management and subsequent rehabilitation of the drainage and irrigation infrastructure, and potentially from direct involvement or through access to the service provided by enterprises developed for agricultural supplies, machinery hire services, marketing etc. All farmers working within the identified former large farm area are eligible to participate. Poor farmers can also benefit from technical advice and guidance in farm and business management and, in particular instances wherever feasible, through support to access credit from KAFC or other relevant financial intermediaries. Poor households with female heads will benefit from greater attention to equitable and fair distribution of land to women. Women will have equal opportunities to participate in these activities. More details on the social analysis are in Appendix 7.

V. TECHNICAL ASSISTANCE

143. Advisory TA—Institutional Strengthening in Planning and Management of Agricultural Development—is being processed in conjunction with the Project. The TA will support COA in developing appropriate approaches, systems, and procedures for planning and managing development in the oblast. The TA will focus on developing (i) an approach to planning and management that is appropriate to the institutional and resource capacity of COA; (ii) coordination strategies and arrangements to optimize the effectiveness of development activities in the region; and (iii) systems and procedures for planning, budgeting, and monitoring financial and implementation activities.

144. The Chui Oblast administration will be the Executing Agency for the TA and it will be supervised by the PSC. The TA will be implemented over a period of 20 months commencing as soon as possible after loan effectiveness. The TA will require 24 person-months of international consulting inputs and 20 of domestic inputs. Individual consultants will be recruited by ADB in accordance with

ADB's *Guidelines on the Use of Consultants* and other arrangements for the engagement of the domestic consultants acceptable to ADB.

145. The cost of the TA is estimated at \$941,210 equivalent, of which \$689,300 will be the foreign exchange cost and \$251,910 equivalent will be the local currency cost. Of this cost, \$800,000 will be financed by ADB, including all foreign exchange costs and \$110,700 equivalent of local costs, on a grant basis from the ADB-funded TA Program. The Government will finance \$141,210 equivalent (Appendix 8).

VI. PROJECT JUSTIFICATION

146. Agriculture is expected to lead the recovery and development of the economy. Most farmers are operating at or near subsistence levels as productivity and profitability have declined markedly. Limited access to inputs, machinery hire services, markets and financial services; a deteriorating drainage and irrigation infrastructure; and poor farm management practices and a dependence on barter exchange prevent many farmers from escaping the low input-low output situation.

147. The Project aims to increase farm productivity and profitability in about three clusters of 20-30 former large farms through a process of farm restructuring and development, rehabilitation of drainage and infrastructure, and development of private sector enterprises to provide inputs, machinery hire, marketing, and other services. The increase in productivity, profitability, and agricultural incomes is crucial for economic growth and poverty reduction.

148. The process approach adopted by the Project will bring together the various organizations and resources necessary to coordinate efforts to support the development of a market-based agriculture in Chui. This support will come from the Government, MAWR, oblast and raion administrations, financing institutions and related rural enterprises, and externally supported projects. Without such a coordinated approach, gaps or weaknesses will remain in the support structure needed for these farms to move to higher sustainable levels of productivity and profitability.

A. Financial and Economic Analyses

149. The financial analysis focused on the viability of the representative farm models envisaged to evolve under the Project. The economic analysis was carried out on the Project as a whole as the four project components are interdependent in terms of benefit impacts. The project life was assumed to be 25 years, including an implementation period of six years. Economic costs and benefits were expressed in the domestic price numeraire. The detailed assumptions of the with- and without-project situations, economic prices, farm budgets, cash flows, and fiscal impact analysis are in Appendix 9.

1. Financial Analysis

150. The ongoing process of the breakup of unified peasant farms and amalgamation of individual and peasant farms makes the determination of the likely configuration of farms at the end of the Project difficult. For the financial analysis, three farm models were identified as likely farm structures that may evolve and be financially viable and sustainable. These are: (i) large farms of about 850 ha, (ii) medium farms of about 65 ha, and (iii) small farms of about 7 ha. It was further assumed that the irrigated land area of each farm is about 70 percent.

151. The results of the financial analysis indicate that each farm type is financially viable. The financial internal rates of return (FIRRs) after financing were estimated at 7.4 percent for large farms, 10.3 percent for medium farms, and 9 percent for small farms. The after-financing FIRR includes financing for working capital and investment loans, cost recovery for full O&M costs, water fees, and 25 percent of the cost of the rehabilitation of on-farm drainage and irrigation.

152. The financial analysis was extended to determine the financial performance of all the farms under the Project. Of the total irrigated land area of 55,000 ha under the Project, about 36 percent

was assumed to be farmed by large unified peasant farms (UPF), 24 percent by medium farms, and 40 percent by small farms. Taking account of the changing structure of farms it was assumed that by the end of the project implementation period the area of large, medium, and small farms would be 18, 34, and 48 percent of the 55,000 ha, respectively. It was further assumed that about 75 percent of all farms in the project area would attain full development. The remaining 25 percent would benefit mainly from drainage and irrigation but may experience constraints in accessing working capital and investment finance. Hence, they will not be able to fully utilize all the available benefits of the Project. The overall FIRR for all farms reaching full development was estimated at 17.6 percent.

2. Economic Analysis

153. Investment and recurrent costs were segregated into their foreign and local currency components based on the percentage distribution of foreign and local cost estimates. Local costs were broken down into their nontraded and labor components and brought to the domestic price numeraire using financial prices net of taxes, duties, and subsidies. Traded components were brought to the domestic price numeraire using a shadow exchange rate of Som44.21 to \$1.00, based on a shadow exchange rate factor of 1.053 and the prevailing exchange rate of Som42 to \$1.00. All costs were expressed in 1999 constant prices. The economic life of the Project was assumed at 25 years.

154. General labor conditions exhibit significant unemployment and underemployment. Most of the unemployed workforce is relatively unskilled, having previously worked as farm laborers or as clerical staff within rural enterprises. The rural market is seasonal but, given the high levels of underemployment, there is little or no prospect of labor shortages during harvest periods. On balance, it was assumed that the opportunity cost of unskilled labor is lower than the wage rate, with a shadow wage rate of 0.6.

155. The incremental benefit streams derived from the financial analysis of the three representative farm types were converted to economic values, using the calculated economic parity prices for wheat and fertilizers, and served as the basis for estimating the incremental economic benefits generated by the Project. As all other farm products and production inputs were assumed to be nontradeable, their corresponding market prices were used in the economic valuation.

156. The resulting net present value showed that the Project is expected to generate approximately Som500 million (\$12 million) for the economy. The Project is expected to realize an economic internal rate of return (EIRR) of about 15 percent.

3. Sensitivity Analysis

157. A sensitivity analysis was undertaken to determine the effect of variations in the estimated costs and benefits of the Project. Switching values indicate that the overall project EIRR is highly sensitive to decreases in crop revenue and crop yields. As crops comprise a significant proportion of total farm revenue, the sustained economic viability of the Project largely depends on the improvement and sustainability of crop yields. It is therefore important to select farms with high potential for diversified and sustained crop development. The EIRR was found to be relatively insensitive to decreases in livestock revenue and irrigated area as well as to increases in production cost. A two-year delay in the generation of benefits produced an EIRR of about 13 percent.

4. Effect on Farm Incomes

158. About 12 large farms, 305 medium farms, and 4,065 small farms, or about 8,000 farm households (about 30,000 persons) are expected to attain full development and fully utilize all the benefits available under the Project. Net farm income per hectare at present is estimated to be Som651 (\$15.50), Som698 (\$16.63), and Som810 (\$19.29) for large, medium, and small farms, respectively. The Project is expected to bring about a threefold increase in net farm income, with incremental annual net farm income per hectare estimated at Som2,071 (\$49.30), Som2,480 (\$59.04), and Som2,011 (\$47.88) for large, medium, and small farms, respectively. About 2,600 farms

(about 10,000 persons) will benefit to a lesser extent as they are expected to be constrained in gaining full access to such project benefits as working capital and investment loans. These farms are expected to realize an increase of about 20 percent in annual net farm income or an incremental income per hectare of about Som130/ha (\$3.10/ha) for large farms, Som140/ha (\$3.32/ha) for medium farms, and Som162/ha (\$3.86/ha) for small farms.

5. Nonquantifiable Benefits

159. The project benefits are far broader than those quantified above. Strengthened input and output market linkages are envisaged to have significant positive impacts on farm production and the marketing of farm commodities, and, consequently, on farm incomes. The transfer of management responsibility to WUAs is expected to result in a reduction in water losses and overwatering with better O&M. The savings in water can reduce the problem of soil salinization. With the O&M of on-farm irrigation being fully funded by the WUAs, the reliance, although small, on the Government's budget will be reduced. Finally, as farms develop there should be increased agricultural wage labor so that the poorer landholders dependent on subsistence agriculture will have an opportunity to improve their livelihood.

160. Higher productivity levels will increase farm incomes and enable farms to implement sustainable practices rather than those leading to continued resource degradation. The improvement in farmers' incomes is further envisaged to improve the purchasing power in the project area and, as a consequence, generate more cash in the economy. The availability of each will significantly reduce farmers' dependence on barter trade and subsequently reduce transactions cost in the marketing of commodities.

161. The Project is expected to have a significant positive effect on the environment since agricultural techniques currently being practiced adversely affect soils and have increased salinity, alkalinity, waterlogging, and erosion. Improvements in farming and land management techniques, particularly the optimal use of fertilizer and chemicals, will reduce the occurrence of soil salinity or alkalinity. Better irrigation management and regular O&M of off- and on-farm drainage and irrigation facilities, including the establishment of on-farm soil protection and erosion facilities, will minimize waterlogging and soil erosion problems as well as wasteful use of water.

6. Fiscal Impact Analysis

162. A fiscal impact analysis was undertaken to determine the effect of the Project on the Government's yearly budgetary allocations before and after ADB financing. Total revenues were assumed to be derived mainly from (i) collection of the water tariff and investment cost recovery; (ii) investment goods tax on civil works, estimated at about 10 percent; and (iii) import tax on fertilizers and agrochemicals, also at 10 percent. Expenditures were estimated based on total project investment cost and O&M cost of off-farm irrigation facilities. Under a scenario in which the Government is assumed to bear all of the investment costs (i.e., before financing), the Government budget would need to provide additional budgetary allocations. However, ADB's assistance for project financing eliminates this burden on the Government and the net effect is that no additional budgetary allocations will be necessary to cover costs incurred during the implementation of the Project.

B. Environment

163. The IEE states that the Project will have a positive impact on the environment through (i) removal of marginal land from agricultural use; (ii) reduction of cultivated lands, especially sloping lands; (iii) reduction of water use for irrigation through better management; (iv) lowering of groundwater levels; (v) improving cultivation techniques to reduce erosion; (vi) use of more diversified cropping patterns to promote soil fertility; (vii) improved drainage to restore soil productivity; and (viii) support for land management, erosion control, and soil protection. The formation of WUAs and

their training to undertake O&M work should ensure the long-term sustainability of environmental and other benefits achieved under the Project.

C. Social Dimensions

164. The expected primary social benefits from the Project will be through higher levels of farm profitability and incomes. All farms in the selected areas will benefit from the improvements in drainage and irrigation, which are to provide a small increase in farm productivity. For farms to benefit totally from the Project, it will be necessary for farmers to be creditworthy to access working capital and investment finance. The Project will work with all participating farms to move them to a creditworthy situation. It is estimated that about 75 percent of the farm area will reach full development. Circumstances may preclude some 25 percent from benefiting completely from all components. Consequently, about 8,000 farm households will benefit fully, with another 2,600 benefiting to a lesser extent. It is expected overall that incomes per hectare will increase from Som725 to Som2100.

D. Impact on Poverty

165. Chui is the least poor of all oblasts. The Project will focus on farms with the potential to maximize benefits. However, the Project is expected to help in poverty reduction as at least 25 percent of the participating farmers in the selected areas are likely to be poor farmers. The Project will benefit these farmers to varying degrees through (i) the farm development component, which will address the key constraints in agriculture, such as marketing, input supply, machinery hire services and credit; (ii) the drainage and irrigation component, which will include rehabilitation and sustainable management of off-farm and on-farm irrigation and drainage infrastructure, and the development of WUAs for farmer participation in irrigation management; (iii) development of the private sector marketing and input supply services for improved provision of services, inputs and technology, and access to markets, and the development of links with microfinance services. The constraints on poor farmers are the extent to which they can access adequate levels of working capital and investment finance. The Project will attempt to develop ways to reduce the financial constraints on poor farmers. During project implementation, arrangements will be worked out with KAFC and other microfinance institutions so that poor farmers can access funds, although small initially, to begin to establish their creditworthiness and benefit more fully from the Project's other activities.

166. The Project will ensure for women equal opportunity to participate in all aspects of the Project. It is envisaged that the Project will bring women directly into the mainstream activities; therefore, the following constraints they face will be addressed: (i) the process of privatization of landholdings will be monitored under the Project so that women are not disadvantaged in respect of land ownership; (ii) women will have full and equal opportunities to participate as members in the new organizations/enterprises to be developed under the Project; (iii) women will be able to participate fully in all training and information dissemination activities to be carried out under the Project; and (iv) farming households with female heads will benefit from the improvements in irrigation and drainage as well as have access to improved input supply, machinery hire services, marketing, and access to credit.

E. Project Risks

167. The economy in the Kyrgyz Republic remains in transition and will continue to be so for many years. Consequently, the situation of the economy in general and in agriculture in particular is highly variable and to some extent unstable. The economy continues to face difficulties, some aggravated by the Russian crisis. These include a budgetary constraint, exchange rate uncertainty, increasing inflation, and financial sector instability. It is beyond the scope of this Project to address this risk directly, but delaying the Project could result in more serious and expensive rehabilitation and development measures. With ADB working with the Government and the rural population now and

facing the risks associated with the Project, it is possible that many of these risks can be more easily minimized. Waiting could simply increase the probability and seriousness of these risks.

168. In examining these risks, it is recognized that the Government has been one of the most progressive of the transitional economies in implementing market reforms. Given the dynamic and uncertain nature of the transition to a market-based economy and the crucial role the Project is expected to play, a process approach to implementation is warranted to avert or mitigate the potential risks. Moreover, the project farmers, while expecting to realize substantial benefits, are being subjected to further significant change in an already continuously changing environment. It is inevitable that they will be cautious in considering their participation in the Project.

1. Policy and Legislative Framework

169. The policy and legislative framework is continually changing. With many funding agencies and organizations advising on and amending policy and legislation, the result is a substantial volume of laws, decrees, and resolutions that conflict with not only previous legislation but also legislation passed since independence. Equally important is that while policy and legislation are made at the national level, there is still considerable difficulty in effectively implementing them at the local level as a degree of local government interference remains in some areas.

170. A key legal issue is that many farm enterprises operate without a lawful status. The existing categories of farm enterprises are not strictly in accordance with the lawful states prescribed in the Civil Code. Farms and farmer organizations will have to form legal enterprises to receive the maximum benefit from participation in the Project. Thus, the Project will ensure that farms are properly and legally registered.

2. Institutional Capacity and Consulting Services

171. The Chui Oblast administration will need to be strengthened and given support to take full responsibility for project implementation. The Government has been reluctant to use loan funds for consulting services but has agreed to what is considered the minimum level of technical support required. A signed contract for consulting services is a condition for the initial disbursement of funds. The Government has also agreed to utilize unallocated loan funds if necessary to meet any shortfall in consulting services. To avert further difficulties arising in project implementation, the TA will provide advice in overall planning and management of agricultural development with a focus on development projects.

3. Farm Debt

172. Many farms still remain indebted to the Government for directed and budget credits provided in previous years. It is estimated that about one third of the agricultural areas have farms with significant levels of debt. Consequently, the debt level will be an important factor in assessing the eligibility of farms for project support, especially any significant investment in farm development. Given the variation in debt levels, it is probable that only a proportion of farming structures within an area will benefit fully from all project activities. Debt is expected to be a significant factor in about 25 percent of the farms that will be constrained by lack of creditworthiness to access working capital and investment loans.

4. Coordination with other Projects

173. While the Government has emphasized the importance of ADB and the World Bank coordinating their activities with respect to drainage and irrigation and the formation and development of WUAs, the ultimate responsibility for the success of this coordinated effort will be with DWR. The proposed jointly financed PIU is already operating and will receive additional support from both the Project and the World Bank.

5. Cost Recovery

174. Cost recovery for on-farm O&M and investment rehabilitation has been a major policy issue during project preparation. While the agreement with the Government is that farmers will pay 25 percent of the cost of rehabilitation of on-farm drainage and irrigation, there is a risk that some farmers may not be able to meet this level of payment. The repayment is estimated to be \$25 per ha. Farmers will not be eligible to participate in the Project's drainage and irrigation activities if they cannot commit to make such payments. The terms and conditions set for the commencement of the Project include a seven-year repayment period with four years grace, commencing after the completion of rehabilitation. The interest rate will be no more than the inflation rate. These terms and conditions will be reviewed during implementation.

6. Implementation

175. The transition to an efficient farming structure is not a short-term process. Flexibility will be required. In particular, there is lack of knowledge and operational management experience with farming and business enterprises in a market economy. The Project attempts to address this problem principally through training and the provision of farm advisers and enterprise development advisers.

176. Given the current surpluses of basic food commodities in Chui Oblast, the expected increases in farm productivity are likely to exacerbate marketing problems as long as the same cropping patterns and combinations of produce are retained. There will be a need to diversify the marketing opportunities. The Project is directly addressing this issue, but there is the risk that not all excess production will be marketed. This could have a serious effect on prices, unless the market begins to accept price differences due to quality.

177. Implementation of the Project will be dependent on many existing and new organizations such as CLARs, RADS, and KAFC as well as the new enterprises to be established under the Project. While this situation increases the risk for the Project, it is inevitable in a transition economy, particularly in one that has continuously pushed the reform frontier forward. The Project will have to monitor the situation carefully and be flexible in implementation to make the necessary change in the project design and/or implementation arrangements.

VII. ASSURANCES

A. Specific Assurances

178. The Government has given the following assurances, in addition to the standard assurances, which will be incorporated in the legal documents.

- (i) The steering committee for overall coordination of the Project will be maintained, with the composition and terms of reference satisfactory to ADB, throughout the implementation period.
- (ii) The steering committee will meet monthly during the first 18 months of the Project and quarterly thereafter, unless circumstances require more frequent meetings.
- (iii) Adequate office space and support services will be provided for the PMU in COA and the PIU in the DWR, in a form satisfactory to ADB, throughout the project implementation period.
- (iv) Within 6 months of loan effectiveness, the Government will provide ADB with copies of all existing laws, decrees, and resolutions relating to WUAs. Within 12 months of loan effectiveness and in consultation with ADB, the Government will have reviewed all laws, decrees, and resolutions relating to WUA formation and registration, and prepared amendments or new legislation as appropriate for the effective formation and

registration of WUAs. A copy of the draft amendments or legislation will be submitted to ADB for comments.

- (v) The Government will ensure that the criteria for the selection of farm areas as agreed upon between the Government and ADB are strictly adhered to and applied objectively so that all farms have an equal opportunity to participate in the Project.
- (vi) The Government will ensure that MAWR and COA maximize the participation of farmers under the Project by
 - (a) involving farmer representatives in the planning and supervision of the drainage and irrigation works, including requiring confirmation from the farmers that the proposed design is acceptable and that works have been carried out in accordance with the design;
 - (b) participation in the evaluation of bids for the civil works;
 - (c) in consultation with ADB, conferring on farmer organizations legal status, powers, and authority adequate for them to take over the O&M and financial management of on-farm irrigation systems; and
 - (d) involving farmers in the formulation of strategies for farm development and subsequent implementation.
- (vii) The PMU will ensure that women farmers are given full opportunity to participate in all project activities and will report on such participation through quarterly progress reports.
- (viii) The Government will arrange to collect from the design and irrigation institutes concerned, and free of charge, the reports, drawings, maps, and other information and historical data on soil and land use characteristics, amelioration requirement, and infrastructure design and construction records, and make them available to the PMU and DWR/PIU.
- (ix) As agreed upon between the Government and ADB, WUAs will agree to finance a portion of the investment costs for on-farm rehabilitation of drainage and irrigation and provide for the full O&M costs after rehabilitation. These terms and conditions will be reviewed at least annually during project implementation.
- (x) The Government will provide sufficient funds from budget resources for the continued O&M of the rehabilitated off-farm drainage and irrigation systems.
- (xi) The Government will permit user fees collected by the WUAs and any other farmer organizations to be retained by these institutions for unrestricted use in O&M of the facilities.
- (xii) The Government will ensure that adverse environmental impacts will be mitigated and appropriate environmental safeguards adopted in relation to the rehabilitation of drainage and irrigation and medium term investment lending by KAFC to farms and other enterprises.
- (xiii) The Government will require close cooperation between MAWR and the Monitoring Department of MEP to ensure that
 - (a) DWR monitors the areas affected by drainage problems and severe waterlogging; and the areas affected by moderate to severe soil salinity and alkalinity;

- (b) the Hydrometeorological Agency monitors water quality and flow in Chui River, the major tributaries, and main drainage canals; and
 - (c) the State Agency on Geology monitors salinity, nitrates, and nitrites in groundwater.
- (xiv) The Government will ensure that the drainage and irrigation plans for each of the farms to be assisted under the Project are subject to prior environmental review and clearance by MEP. Should MEP conclude, as a result of such review, that circumstances warrant an environmental assessment, the respective proponents will have an environmental assessment, satisfactory to MEP, carried out and will submit the results to MEP for MEP's clearance.
 - (xv) The Government will require MAWR to ensure that all pesticide selection, procurement, storage, application, handling, and disposal are done in strict conformity with the Law on Chemical Treatment and Protection of Plants (12/98) and related implementation regulations and procedures.
 - (xvi) The Government will take into consideration and apply, wherever possible, the recommendations of the TA on Institutional Strengthening in Planning and Management of Agricultural Development in Chui Oblast.

B. Conditions for Loan Effectiveness

179. The Government and the Mission agreed that the Government will complete the following actions, acceptable to ADB, prior to loan effectiveness:

- (i) A decree satisfactory to ADB, specifying the respective roles and responsibilities of the Ministry of Finance, MAWR, COA, and other relevant agencies in the implementation of the Project will be issued.
- (ii) A subsidiary loan agreement, in a format and content acceptable to ADB, will be executed between the Borrower and KAFC, and will be submitted to ADB.

C. Conditions for Disbursement

180. The Government has agreed to complete the following actions, acceptable to ADB, prior to the disbursement of funds.

- (i) The contract for consulting services will be signed before the initial release of funds.
- (ii) The Government will develop performance criteria for the management of the Project, acceptable to ADB.

VIII. RECOMMENDATION

181. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank and recommend that the Board approve the loan in various currencies equivalent to Special Drawing Rights 26,159,000 to the Kyrgyz Republic for the Agriculture Area Development Project, with a term of 32 years, including a grace period of 8 years, and with an interest charge at the rate of 1 percent per annum during the grace period and 1.5 percent per annum thereafter, and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan and Project Agreements presented to the Board.

TADAO CHINO
President

25 November 1999

APPENDIXES

Number	Title	Page	Cited on (page, para.)
1	Project Framework	37	1, 2
2	Cost Estimates and Financing Plan	41	21, 109
3	Project Organization Chart	43	22, 113
4	Implementation Schedule	44	24, 125
5	Indicative Procurement Packages	45	25, 127
6	Terms of Reference for Consultants	46	25, 128
7	Social Analysis	53	27, 142
8	Technical Assistance for Institutional Strengthening in Planning and Management of Agricultural Development	62	28, 145
9	Financial and Economic Analyses	65	28, 149

SUPPLEMENTARY APPENDIXES (available on request)

- A Detailed Cost Tables
- B Training Plan
- C Summary Initial Environmental Examination
- D Detailed Financial and Economic Analyses

PROJECT FRAMEWORK

Design Summary	Performance Targets	Monitoring Mechanism	Assumptions and Risks
Goal Increase incomes of farmers in Chui Oblast	Income per hectare increases about 190 percent from Som725 to Som2,100 by 2005 and is sustained.	Oblast statistics Farm surveys	
Purpose Increase on-farm productivity and profitability	Yields (mt/ha) increase by 2005: Wheat 1.9 - 3.97 Maize 3.3 - 5.00 Sugar beet 15.0 - 22.0 Sunflower 0.9 - 1.40 Potatoes 9.0 - 14.0 Onions 7.0 - 18.0 Barley 0.75 - 2.45 Milk (liter/cow) 1,200 - 2,200 Beet (kg/yr) 120 - 180 75 percent of farms reach a commercial level of activity.	Oblast statistics Farm surveys Project reports	Macroeconomic conditions are stable or improved. All inputs are available and accessible in adequate quantities and on a timely basis. Public sector agencies provide effective support role. Private sector develops in inputs supply, marketing, and agroprocessing. Domestic and export markets are stable. Farmers access adequate levels of working capital and investment finance.
Components/Outputs 1. Farm Development 1.1 Farms restructured and registered as legal enterprises 1.2 Farmers and staff of agriculture training institutions trained in farm management and farm business development 1.3 Farms developed as commercially viable enterprises 1.4 Annual survey of farms established	Farms on 29,000 ha are restructured and legally registered 12,000 farmers are trained. 10 staff are trained overseas. Institutional link is established between foreign and local training institutions. \$3.5 million in working capital is provided and repaid. \$10 million in investment capital is provided and repaid Surveys are conducted and results used for planning and monitoring agriculture activities.	Farm survey Project reports Project reports KAFC records KAFC records Farm survey	Government continues reform process toward market-based system. Participants are effective in implementing training in practice. Farmers are willing to diversify cropping patterns. Restructuring is not dominated or controlled by a relatively small number of individuals. Farms are not isolated from essential support. Survey has support of farmers, Chui Oblast administration, and National Statistics Committee.

Design Summary	Performance Targets	Monitoring Mechanism	Assumptions and Risks
2. Drainage and Irrigation			
2.1 Rehabilitation and improvement of existing drainage infrastructure completed	<p>Rehabilitation of drainage infrastructure on 24,000 ha servicing an irrigated service area of 55,000 ha by 2005</p> <p>Rehabilitation of 1,000 km of open main collector drains serving additional 106,000 ha of irrigable land by 2005</p> <p>Development of technical packages to test shallow field drains and vertical drainage for irrigation, and establishment of a computerized data base by 2005</p>	Project reports ADB review missions	Government supports rehabilitation and maintenance of off-farm drainage and irrigation infrastructure.
2.2 Rehabilitation and improvement of existing irrigation infrastructure completed	<p>Rehabilitation of irrigation infrastructure serving 55,000 ha by 2005</p> <p>Completion and adaptation of irrigation infrastructure on the same 55,000 ha by 2005</p> <p>Up to four DWR staff participate in study tour.</p>	Project reports ADB review missions	<p>Farmers give high priority to rehabilitation of irrigation.</p> <p>Farmers actively maintain on-farm drainage and irrigation infrastructure.</p> <p>Farmers pay full O&M.</p> <p>Farmers establish effective WUAs.</p> <p>Farmers meet 25 percent of cost of rehabilitation of on-farm irrigation.</p>
2.3 Improved soil and land management completed	12,000 ha subject to land management and soil protection measures by 2005	Project reports ADB review missions	Farmers readily adopt and practice improved techniques.
3. Development of Private Sector Marketing and Input Supply Services			
3.1 Agribusiness enterprises for input supply, marketing, and other services established	<p>No. of enterprises established</p> <p>No. of members</p> <p>\$ turnover</p>	Project reports ADB review missions Surveys	<p>External sources of input supply and distribution are reliable.</p> <p>Inputs are available at affordable prices for farmers.</p>
3.2 Availability and access to appropriate machinery hire services established	<p>Up to 1,000 entrepreneurs trained in organizational, management, and financial arrangements for business enterprises</p> <p>No. machinery hire service units established/improved</p> <p>\$ turnover</p>	Project reports ADB review missions Surveys	<p>Machinery and equipment are effectively maintained.</p> <p>Machinery hire service units effectively service farming community.</p>
3.3 Domestic and export market links	<p>No. export links established and maintained</p> <p>No. links developed with marketing outlets and agribusinesses</p>	Project reports ADB review missions Surveys	Agribusiness provides reliable market access.

Design Summary	Performance Targets	Monitoring Mechanism	Assumptions and Risks
4. Project Management			
4.1 Effective project management system established	<p>Project implemented on schedule</p> <p>System reports on project status and contracts submitted on timely basis</p>	ADB review missions	<p>International and domestic consultants provide effective support to Chui Oblast Administration.</p> <p>Implementation and management arrangements can deal effectively with interference from influential parties.</p> <p>Cooperation among agencies is effective.</p>
Activities			
1. Farm Development	<p>Base Costs (\$ million)</p> <p>Foreign Exchange 3.6</p> <p>Local Costs 3.1</p> <p>Total 6.7</p>	Project reports ADB review missions	<p>Farmers willing to restructure and form legal entities.</p> <p>No Government interference in farming activities</p> <p>Land certificates are distributed efficiently and effectively.</p>
1.1.1 Plan and carry out public information campaign.			
1.1.2 Identify and select large farms			
1.1.3 Undertake initial comprehensive participatory survey of each selected former large farm			
1.2.1 Contract foreign training institution			
1.2.2 Arrange local and foreign training in farm and business management			
1.2.3 Provide farmer and business training			
1.2.4 Monitor farm performance			
1.3.1 Assist with the preparation of business plans			
1.3.2 Facilitate access to working capital and investment loans for farmers			
1.4.1 Coordinate relevant agencies to undertake annual survey of farms			
1.4.2 Conduct annual survey of farms and publish results			
2. Drainage and Irrigation	<p>Base Cost (\$million)</p> <p>Foreign Exchange 5.6</p> <p>Local Costs 9.7</p> <p>Total 15.3</p>	Project reports ADB review missions	Farmers are willing to form WUAs and adopt legal status.
2.1.1 Prepare annual work program			
2.1.2 Undertake detailed design of drainage works and scheduling			
2.1.3 Prepare and award contracts			
2.1.4 Monitor implementation			

DWR = Department of Water Resources, ha = hectare, KAFC = Kyrgyz Agricultural Finance Corporation, kg = kilogram, MAWR = Ministry of Agriculture and Water Resources, mt = metric ton, O&M = operation and maintenance, WUA = water users association, yr = year.

COST ESTIMATES AND FINANCING PLAN

Table A2.1: Project Cost Summary by Component

Item	Som '000					\$ '000				
	Local		Foreign		% Total	Local		Foreign		% Total
	Currency	Exchange	Amount	%		Currency	Exchange	Amount	%	
1. Farm Development	129,374	150,043	279,417	54	18	3,095	3,611	6,706	54	18
2. Drainage and Irrigation	408,910	234,785	643,695	36	41	9,740	5,600	15,340	37	40
3. Development of Private Sector Marketin and Input Supply Services	158,997	350,409	509,406	69	32	3,811	8,440	12,251	69	32
4. Project Management	72,045	77,767	149,812	52	9	1,720	1,870	3,590	53	9
Total Baseline Costs	769,326	813,004	1,582,330	51	100	18,366	19,521	37,887	52	100
Physical Contingencies	116,002	57,112	173,114	33	11	2,762	1,360	4,122	33	11
Price Contingencies	135,302	46,736	182,038	26	12	1,582	545	2,126	26	6
Total Project Costs	1,020,630	916,852	1,937,482	47	122	22,710	21,425	44,135	49	116
Interest During Construction	0	37,324	37,324	100	2	0	865	865	100	2
Total Costs to be Financed	1,020,630	954,176	1,974,806	48	125	22,710	22,290	45,000	50	119

Note: Figures may not add up due to rounding.

Source: Staff estimates.

Table A2.2: Components by Financier
(\$ '000)

Item	Government			ADB			KAFIC			Beneficiaries			Total			Foreign			Local		
	Amount		%	Amount		%	Amount		%	Amount		%	Amount		%	Amount		%	Amount		%
	Amount	%		Amount	%		Amount	%		Amount	%		Amount	%		Amount	%		Amount	%	
1. Farm Development	415	6.0	2,443	35.2	3,763	54.0	323	4.6	6,944	15.4	3,645	2,852	447								
2. Drainage and Irrigation	2,368	11.3	18,195	86.6	0	0.0	452	21.1	21,015	46.7	7,437	11,352	2,226								
3. Development of Private Sector Marketing and Input Supply Services	225	1.8	11,180	89.9	290	2.3	745	6.0	12,440	27.6	8,450	3,690	300								
4. Project Management	419	11.2	3,317	88.8	0	0.0	0	0.0	3,736	8.3	1,893	1,443	400								
5. Interest During Construction			865	100.0					865	2.0	865										
Total Disbursement	3,427	7.8	36,000	79.6	4,052	9.2	1,521	3.4	45,000	100.0	22,290	19,337	3,373								

Note: Figures may not add up due to rounding.

ADB = Asian Development Bank, KAFIC = Kyrgyz Agricultural Finance Corporation.

Table A2.3: Expenditure Accounts by Financier
(\$ '000)

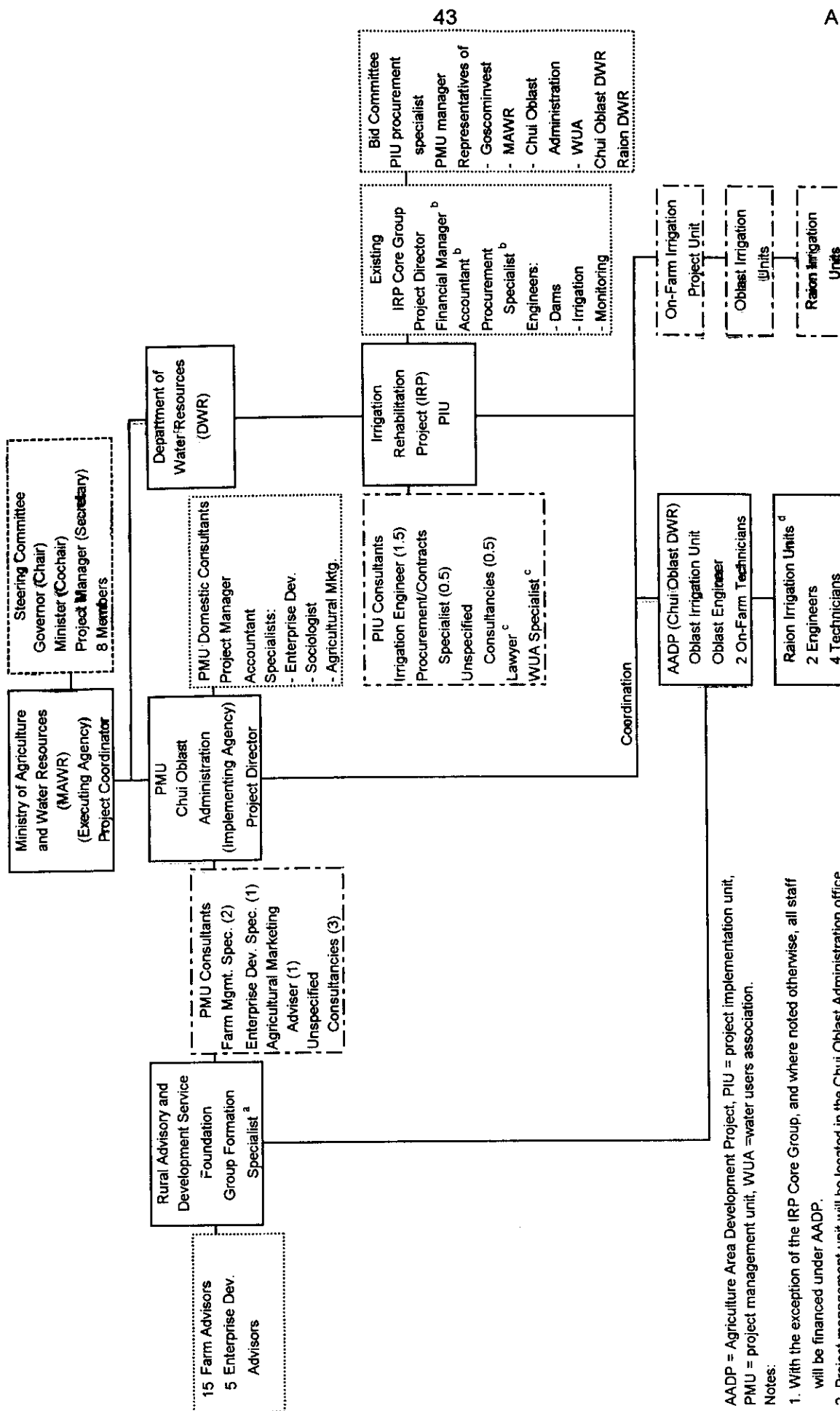
Item	Government		ADB		K AFC		Beneficiaries		Total		Foreign		Local		Duties and Taxes
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Exchange	Taxes	Currency (Excl. Taxes)	Taxes	
A. Investment Costs															
1. Civil Works	1,700	10.0	15,304	90.0	0	0.0	0	0	17,005	37.8	5,564	9,740	1,700		
2. Vehicles	100	20.0	398	80.0	0	0.0	0	0	498	1.1	398	0	100		
3. Equipment and Machinery	192	20.0	769	80.0	0	0.0	0	0	961	2.1	769	0	192		
4. Training	227	10.0	2,045	90.0	0	0.0	0	0	2,273	5.0	856	1,189	227		
5. Credit	0	0	10,000	74.1	3,500	25.9	0	0	13,500	30.0	10,800	2,700	0		
6. Consulting Services															
International Experts	0	0	2,501	100.0	0	0.0	0	0	2,501	5.6	2,501	0	0		
Domestic Experts	122	10.0	1,099	90.0	0	0.0	0	0	1,221	2.7	0	1,099	122		
Subtotal Consulting Services	122	3.3	3,600	96.7	0	0.0	0	0	3,722	8.3	2,501	1,099	122		
7. Materials and Services	187	20.0	749	80.0	0	0.0	0	0	937	2.1	153	596	187		
Total Investment Costs	2,529	6.5	32,866	84.5	3,500	9.0	0	0	38,894	86.4	21,041	15,324	2,529		
B. Recurrent Costs															
1. Administration	0	0	0	0.0	0	0.0	1,069	100	1,069	2.4	0	962	107		
2. Vehicle Operation and Maintenance	55	20.0	219	80.0	0	0.0	0	0	273	0.6	137	82	55		
3. Other Operation and Maintenance	711	24.5	1,736	59.9	0	0.0	452	15.6	2,899	6.4	247	2,101	550		
4. Travel	29	10.0	259	90.0	0	0.0	0	0	287	0.6	0	259	29		
5. Salaries	104	14.6	56	7.9	552	77.5	0	0	713	1.6	0	609	104		
Total Recurrent Costs	898	17.1	2,270	43.3	552	10.5	1,521	29.0	5,241	11.6	384	4,012	844		
C. Interest During Construction															
Total Disbursement	3,427	7.8	36,000	79.6	4,052	9.2	1,521	3.4	45,000	100.0	22,290	19,337	3,373		

Note: Figures may not add up due to rounding.

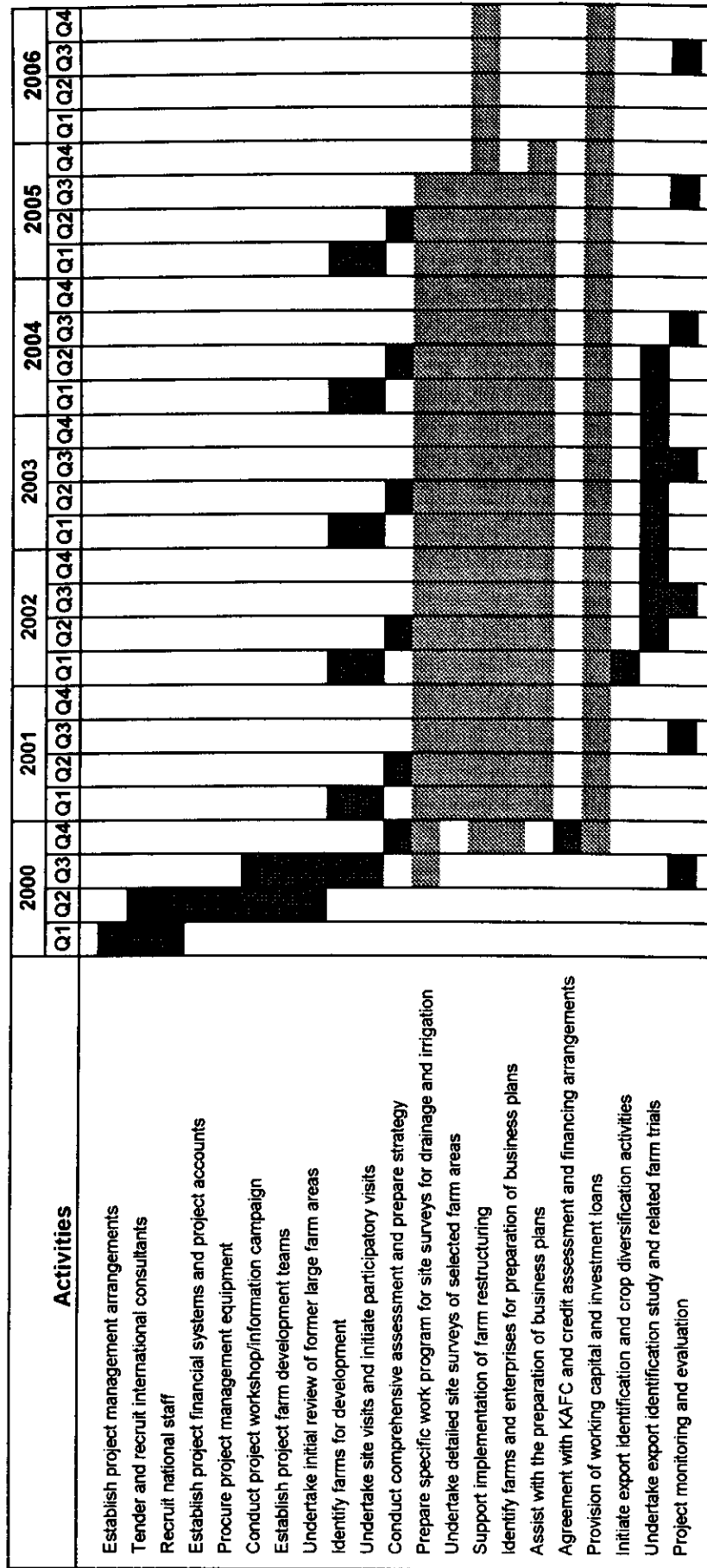
ADB = Asian Development Bank, K AFC = Kyrgyz Agricultural Finance Corporation.

Source: Staff estimates.


PROJECT ORGANIZATION CHART




IMPLEMENTATION SCHEDULE



KAFC = Kyrgyz Agricultural Finance Corporation.

 Continuous

 Intermittent

INDICATIVE PROCUREMENT PACKAGES

Package	Description	Procurement Method	Value ^a (\$ million)
A	Drainage Equipment - closed drain cleaning pump - mobile drilling units - trenching machine	ICB	0.44
B	Pumps and Water Delivery Equipment	IS	0.19
Multiple	Vehicles/Motorcycles	IS	0.40
Multiple	Office Furniture and Equipment	DP	0.94
Multiple	Civil Works	LCB	13.00
Total			14.97

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

^a Excluding taxes and duties.

TERMS OF REFERENCE FOR CONSULTANTS

A. International Consultants

1. A firm of international consultants comprising the following positions will be recruited in accordance with ADB's *Guidelines on the Use of Consultants*.

1. Farm Management Specialist/Team Leader (2 years)

2. The farm management specialist will act as the team leader for the Project and will report to the project manager.

3. The specific tasks of the farm management specialist include the following:

- (i) work with the Executing Agency, project manager, PMU, project implementation unit (PIU), and other international and domestic consultants and in cooperation with the technical assistance (TA) regional planning team leader to facilitate coordination in project implementation;
- (ii) coordinate and lead the activities of the international and domestic consultants;
- (iii) coordinate closely with other agencies in the day-to-day activities of the Project: Center for Land and Agrarian Reform (CLAR), Rural Advisory and Development Service Foundation (RADS), and Kyrgyz Agricultural Finance Corporation (KAFC);
- (iv) cooperate with the TA financial specialist to ensure that appropriate project management systems are established for financial management (budgeting, withdrawals, disbursement, and reporting), progress reporting procedures, and monitoring and evaluation in accordance with ADB guidelines;
- (v) assist in the preparation of the information campaign for the Project;
- (vi) take a lead role in the preparation and conduct of the benchmark and annual farm surveys, working with the TA, National Statistics Committee, and Directorate of Economics in MAWR;
- (vii) participate in the identification of farms to be supported by the Project;
- (viii) ensure, in close cooperation with the Republican Center for Land and Agrarian Reform (RCLAR) and other state agencies concerned, the development of an appropriate ownership/tenure framework which meets the needs of farmers and land owners;
- (ix) ensure, in close cooperation with RCLAR and other state and local agencies concerned, that entitlements of participating farms and beneficiaries under the land and agrarian reform program are in accordance with the law, and ensure that farms are duly registered and are provided with the necessary assistance;
- (x) develop an approach to farm restructuring and development, and a strategy including options for the reorganization of farms and landholdings; inform land and property owners of these options, and assist the owners to make and implement their choice;
- (xi) ensure the development of farm structures that facilitate the attraction and application of new capital and improved access to working and investment capital;
- (xii) facilitate and ensure the establishment of the necessary linkages between the participating restructured farms and input supply, machinery, and marketing services supported by the Project; and agroprocessing enterprises;

- (xiii) pay due regard to arrangements for the maintenance of rural economic and social infrastructure in the project areas;
- (xiv) define the needs and arrangements for the development and implementation of training programs relating to farm restructuring and management for RADS staff, CLAR staff, and farmers;
- (xv) provide on-the-job training for the domestic farm adviser consultants;
- (xvi) assist with the development of a regular farm-level survey of participating farms;
- (xvii) ensure effective participation of farmers and landowners in the conduct of surveys, development of strategies and options, and the making of decisions affecting the development of their farms; and
- (xviii) prepare progress and final reports in English and Russian.

4. The farm management specialist should have 10-15 years experience as a farm management specialist and team leader. In particular he/she should have firsthand experience of the farm restructuring process in the former Soviet Union and of the commercialization of emerging enterprises. He/she should have experience in developing appropriate training programs. Experience in transitional economies, especially Central Asia, is highly desirable.

2. Enterprise Development Specialist (1 year)

5. The enterprise development specialist will report to the project manager and the farm management specialist.

6. The specific tasks of the enterprise development specialist are to

- (i) develop criteria for and identify suitable farm and other business enterprises for development and support under the Project;
- (ii) prepare an enterprise development program for specific activities/types of enterprises reflecting such requirements as input supply, machinery hire, produce marketing, etc.;
- (iii) assist enterprises in the preparation of business plans, applications for financing, and management of the enterprise;
- (iv) provide training to both RADS staff, farmers, and entrepreneurs in the establishment, operation, and management of farm and other business enterprises;
- (v) develop suitable training materials for continuing training in enterprise development;
- (vi) provide on-the-job training for the domestic enterprise development specialist; and
- (vii) prepare progress and final reports in English and Russian.

7. The enterprise development specialist should have 10-15 years experience in enterprise development. He/she should have experience in developing appropriate training programs. Experience in transitional economies, especially Central Asia, is highly desirable.

3. Agricultural Marketing Specialist (1 year)

8. The agricultural marketing specialist will report to the project manager and the farm management specialist.

9. The specific tasks of the agricultural marketing specialist are to

- (i) identify existing and potential domestic and export markets for the oblast, the competitiveness of the products produced, the potential for increased competitiveness, and the constraints to achieving this competitiveness;
- (ii) identify a market development program for specific commodities;
- (iii) prepare terms of reference for further analysis of particular markets and opportunities for existing and new commodities, and supervise the conduct of these studies;
- (iv) work with farmer groups and agribusinesses to develop links and contract arrangements between them;
- (v) work with exporters to establish or further develop exporters' associations;
- (vi) coordinate with the farm management specialist and RADS in the conduct of farm trials for the development of suitable commodities for the export markets;
- (vii) provide training to both RADS staff, farmers, and entrepreneurs/enterprises in identifying and maintaining markets;
- (viii) develop suitable training materials for continuing training in marketing;
- (ix) provide on-the-job training for the domestic marketing specialist; and
- (x) prepare project and final reports in English and Russian.

10. The agricultural marketing specialist should have 10-15 years experience in actively marketing agricultural commodities. He/she should have experience in developing appropriate training programs. Experience in transitional economies, especially Central Asia, is highly desirable.

4. Drainage/Irrigation Engineer (1.5 years)

11. The drainage/irrigation engineer will work in the PIU located in the Department of Water Resources (DWR) head office and will work closely with the DWR office in Chui Oblast. He/she will work closely with other staff in the PIU to ensure a consistent approach to drainage and rehabilitation. The main focus of the engineer's activities will be on drainage.

12. The engineer's responsibilities, which will aim at identifying and developing suitable cost-effective drainage solutions for selected command areas, will include the following

- (i) conduct a hydraulic review of drainage and irrigation networks for selected command areas and with regard to local drainage basins;
- (ii) conduct a detailed design review for improving drainage and irrigation installations at farm/field level considering changing field irrigation methods within the command areas selected for rehabilitation;
- (iii) plan and supervise pilot implementation of shallow field drainage using state-of-the-art drainage technology (narrow trenching, trenchless drainage) on selected sites covering a total of 200-250 ha;
- (iv) review the use of vertical drainage wells for control of groundwater levels in selected command areas and comment on the potential for conjunctive use of drainage water for irrigation;
- (v) select potential sites for drilling of up to 10 vertical drainage/irrigation wells and establish appropriate monitoring procedures to evaluate their suitability for wider application;

- (vi) review equipment utilization and suitability for installation of farm/field drainage and determine unit area cost rates on the basis of the observed pilot implementation costs;
- (vii) design and promote soil conservation and erosion control measures to improve land management within the selected areas;
- (viii) prepare design drawings suitable for initiation of tendering procedures in accordance with ADB requirements;
- (ix) assist with the specification of equipment and machinery for procurement in accordance with ADB's *Guidelines for Procurement*;
- (x) for selected command areas, define and comment on the establishment of an infrastructure inventory database using the Scheme Irrigation Management Information System (SIMIS) software developed by the Food and Agriculture Organization;
- (xi) advise on training activities for selected WUA members and DWR staff at head office, oblast, raion, and WUA levels; and
- (xii) prepare progress and final reports in English and Russian.

13. The drainage/irrigation engineer should have at least 10 years experience in planning and implementing gravity and pump-operated drainage and irrigation infrastructure. Experience in dealing with salinity and alkalinity problems in an environment similar to that of the Kyrgyz Republic is highly desirable. The engineer should be familiar with former Soviet Union design practices.

5. Contracts Specialist (0.5 year)

14. The contract specialist will be located in the PIU of the DWR head office and will work closely with the DWR office in Chui Oblast.

15. The contract specialist's responsibilities will be as follows:

- (i) become familiar with existing and new contract arrangements in the Kyrgyz Republic;
- (ii) work closely with the PIU, PMU, and staff of DWR in Chui Oblast in establishing agreed upon standards for procurement acceptable to ADB;
- (iii) assist with the establishment of acceptable procedures for the preparation of tendering documents, prequalification of potential contractors, evaluation of bids, and supervision of awarded contracts;
- (iv) undertake on-the-job training for local staff; and
- (v) prepare progress and final reports in English and Russian.

16. The contract specialist should have at least five years experience in costing of works, bidding, contract evaluation, and measuring of works in transitional economies. He/she should be familiar with current contracting practices.

6. Financial Investment Analyst (0.5 year)

17. The financial investment analyst will work with KAFC and will report to its director. The specific tasks of the financial investment analyst are as follows:

- (i) visit potential farmers and entrepreneurs and assess, in close collaboration with KAFC officers, their viability and creditworthiness as possible borrowers from KAFC;
- (ii) liaise with staff of the PMU to assist farmers to understand the requirements of investment lending and to prepare applications for such lending;
- (iii) with KAFC officers, analyze business plans from potential customers and propose changes, if necessary;
- (iv) prepare recommendations for lending;
- (v) participate in credit committee meetings to process loans;
- (vi) carry out practical, on-the-job training of KAFC officers in the analysis and preparation of assessments and recommendations;
- (vii) review the investment lending manual and make recommendations;
- (viii) work with KAFC management and staff on customer-related subjects; and
- (ix) prepare a progress report and final report in English and Russian on the results of the assignment.

7. Unallocated Short-Term Specialists (3.5 years)

18. These specialists will be recruited on an as-needed basis during the implementation of the Project where specialists' skills are not available. Possible areas of discipline include farm machinery and equipment and particular commodity expertise such as dairying and oilseed production/processing. Also, these resources will be available to extend the input of the long-term specialists if additional time is warranted.

B. Domestic Consultants

19. All domestic consultants will be recruited through a competitive process acceptable to ADB. The positions will be advertised nationally, and candidates will be interviewed by a committee comprising the project coordinator, project director, farm management specialist/team leader, and a representative of RADS. The project manager will join the committee for the selection of other candidates. The appointed personnel will be acceptable to ADB.

1. Project Manager (6 years)

20. The project manager will head the PMU, and will report to the project director.

21. The responsibilities of the project manager are as follows:

- (i) exercise overall management of the Project by coordinating all activities and providing guidance and direction to the agencies involved;
- (ii) ensure that the Project is implemented in accordance with the design and agreement with ADB;
- (iii) work closely with the farm management specialist/team leader of the international consultants to ensure effective implementation of the Project;
- (iv) manage all personnel, both domestic and international consultants, and other staff;
- (v) prepare an annual work plan and budgets;
- (vi) manage the procurement of goods, works, and services in accordance with ADB's *Guidelines for Procurement*;

- (vii) manage project funds following sound accounting, budgeting, financial control, and audit procedures acceptable to ADB;
- (viii) prepare withdrawal applications and maintain records on disbursements acceptable to ADB;
- (ix) ensure that all training, including that for project management staff, is undertaken and is effective;
- (x) prepare quarterly progress and other reports on the implementation of the Project, and submit them to ADB through the project coordinator to ADB on a timely basis; and
- (xi) ensure that annual audits are undertaken and the reports submitted to ADB by 30 June of the following year.

22. The project manager should have qualifications in agriculture, economics or management, including postgraduate training, preferably overseas. He/she should have worked with an aid project or funding agency for at least one year. The candidate should have good communication skills, both verbal and written, and should be fluent in English, Kyrgyz, and Russian. He/she should also have experience in working with Government. He/she should have an ability to manage a multidisciplinary team of international and domestic consultants.

2. Project Accountant (6 years)

23. The project accountant will report to the project manager.

24. The responsibilities of the project accountant are as follows:

- (i) work with the project manager to establish an appropriate financial management, and accounting and audit system for the Project acceptable to ADB; the accounting system should be similar to other systems in use in MAWR and appropriate for broader use by the Chui Oblast administration;
- (ii) maintain all accounts in accordance with international accounting standards;
- (iii) prepare annual budgets, monitor expenditures, and arrange timely internal and external audits of all project funds;
- (iv) prepare withdrawal applications for ADB financing;
- (v) provide monthly reports to the project manager, project director, project coordinator, and the project steering committee; and
- (vi) submit quarterly reports for incorporation into progress reports to be submitted to ADB.

25. The project accountant must have qualifications in accounting, be familiar with international accounting standards, have worked in a project situation, and have at least five years experience as a practicing accountant. He/she should be fluent in Russian, Kyrgyz, and English.

3. Farm Management Specialist/Enterprise Development Specialist/ Agriculture Marketing Specialist (16.25 years)

26. These specialists will work as counterparts to the international consultants and continue this work following the withdrawal of the international consultants.

27. These counterpart specialists must have technical qualifications in agriculture, business, or related disciplines, and have work experience in projects or related activities. They should be fluent in Russian and Kyrgyz. Ability to speak English is highly desirable.

4. Sociologist (3.5 years)

28. The sociologist will report to the project manager.

29. The sociologist will

- (i) assist in the preparation of the information campaign for the Project to ensure an effective focus on the involvement of women;
- (ii) participate in the preparation and conduct of the farm surveys; in particular, prepare a comprehensive farm socioeconomic survey, pilot-test the survey, and conduct the survey on selected farms;
- (iii) identify the needs and opportunities for the involvement of women in project activities, and ensure that such needs and opportunities are effectively implemented; and
- (iv) ensure effective farmer participation in the conduct of surveys and the development of strategies and decisions affecting the development of their farms.

30. The sociologist must have at least five years experience in conducting rural-based socioeconomic surveys. He/she should be fluent in Russian and Kyrgyz. Ability to speak English is highly desirable.

5. RADS Consultants (60 years)

31. The Project will recruit up to 20 domestic consultants to work within RADS. Of the 20, about 15 will be farm advisory consultants and 5 enterprise development consultants.

32. All will work under RADS conditions and will be recruited according to RADS procedures.

33. The responsibilities of the domestic farm advisory consultants will be similar to those of RADS staff. These domestic farm advisory consultants will focus on Chui Oblast and the activities of a selected group of project farms. Similarly, the enterprise development consultants will focus on selected enterprises in the project area.

34. The RADS consultants must have appropriate qualifications in agriculture, economics, management, or business. They should have some experience working with farms and/or enterprises. They should speak both Russian and Kyrgyz. Some English will be desirable. At least half the candidates should be below 35 years old. The RADS consultants will be recruited by the same committee recruiting other domestic consultants.

SOCIAL ANALYSIS

A. Introduction

1. The social analysis is based on a study of secondary materials as well as fieldwork consisting of the consultants' reports, participatory rural appraisal (PRA) on three farms, and interviews with individual farmers, staff and workers, local government officials, private providers of agricultural support services, as well as discussions with government and nongovernment organizations (NGOs) and funding agencies.

2. After independence, the Kyrgyz Republic, which was one of the poorest members of the former Soviet Union (FSU), faced tremendous hardship. The government structures as well as society were not prepared for the radical changes that were to follow. The Government responded with a series of reforms and approaches that are still evolving. These changes, particularly in the areas of land and agrarian reform, agricultural production, agricultural finance, organization of agricultural support services, and social services among others, while providing supportive mechanisms, are having serious effects on the rural economy.

3. The early years of the transition were characterized by hardship and upheaval including rising underemployment/unemployment, increasing poverty, lack of access to education, child care, and health services leading to gender-based disadvantages for women. Various disadvantaged groups emerged, including women who lost their jobs and bore the brunt of declining social support services, children, pensioners among whom women constitute a significant proportion, and the elderly. Rural communities became relatively disadvantaged on account of the changes in agricultural production systems and growing unemployment and underemployment, as well as the sharp decline in their access to basic services and social protection.

4. The breakdown of ties to the FSU and the disruption of the traditional system adversely affected the agriculture sector. The effects included (i) the loss of access to traditional markets in the FSU; (ii) a breakdown of the financing mechanisms for agriculture; (iii) continuing changes in landholding structures and legal frameworks for landholding; (iv) disruption and decay of agricultural support services such as timely and required access to farm machinery supply and upkeep of farm machinery, and access to inputs and markets; (v) lack of continued investments into the operation and maintenance of irrigation and drainage infrastructures; (vi) poor credit-worthiness of a majority of farms; (vii) lack of experience and expertise in commercial farming geared to new markets and new crops; (viii) the lack of alternative structures for the organization of agricultural services; and (ix) the reduction of social support services and infrastructure such as preschool institutions, schools, and hospitals.

5. By 1998, the human development situation was as follows. Infant mortality decreased from 31.9 to 28.2 per 1,000 born. Life expectancy rates and adult literacy rates held, but the poverty index rose from 45.4 in 1993 to 71.3 in 1997. Total health and education expenditures are decreasing and serious gaps have emerged in the availability of basic services in these areas. Maternal mortality rates have risen from 45 to 63 per 10,000 live births. Total fertility rates are declining. Women's labor force participation has come down to 47 percent, and their enrollment in tertiary education, and participation in administrative and managerial positions have declined.

B. General Social Situation

1. Poverty

6. The economic transition has contributed to increasing poverty, as a result of the rapid economic change leading to loss of social protection, increasing underemployment and unemployment, reduced consumption, and the emergence of particularly vulnerable sections of the population.

7. The 1998 United Nations Development Programme National Human Development Report described the current situation as very difficult, but indicated that the hardest years seemed to have passed. Nevertheless, poverty levels remain high and the country has moved from the World Bank's average-income countries group classification to the poorest countries group.

8. Household consumption rather than incomes is a more useful measure of poverty at the present transition stage, as incomes fluctuate due to household income earners shifting between sectors, the changing organization of production, the prevalence of an informal economy, and barter transactions, as well as underreporting of incomes for fear of taxation. The extreme or food poverty line is calculated on the basis of a food basket, which provides the daily calorie requirements and reflects the dietary patterns of the people. The nonfood poverty component of the general poverty line is based on nonfood expenditures at the level of households whose food consumption is close to the food poverty line. In 1997, the general poverty line for the Kyrgyz Republic, based on the food and nonfood consumption measures, was Som4,647 per capita per annum, and the extreme poverty line was Som2,439.

9. The population can be divided into three groups: those living in extreme poverty, those living in poverty in general, and those who are not poor. In 1997, 51 percent were living under poverty conditions and 14.8 percent in extreme poverty. The figures for 1996 were 49 percent and 19.1 percent, respectively. The share of the population living under extreme poverty is lower than that in other countries with similar overall poverty rates. However, the average poverty gap is 18 percent, which is an indication that the extreme poor live under much worse conditions than those in other countries of the FSU, such as Kazakhstan (11.4).

10. Poverty in the Kyrgyz Republic is not evenly distributed. Furthermore, poverty is a rural phenomenon, with rural poverty at double the urban rates. The level of extreme poverty in the rural areas is four times that in the urban areas. Not only is the rural population poorer, the extreme poor are much worse off than their urban counterparts. The gap between the urban and rural populations in terms of poverty has widened in the period 1996-1997. While extreme poverty levels have declined in the rural areas, it is in the urban areas that extreme poverty levels have seen the most substantial reductions. Translated into human terms, it means that most of the poor and the extremely poor people live in the rural areas. Geographically, poverty is also not evenly distributed between the oblasts. Naryn Oblast is the poorest, while Chui Oblast and the capital Bishkek have the lowest levels of poverty.

11. Nationally, food represents 58 percent of household consumption. For poor households, home production represents one third of total consumption, whereas for the near poor and nonpoor this is approximately 20 percent. As a percentage of household expenditures, nonfood consumption by the nonpoor, is marginally more than that by the poor for utilities, and is less on education, household goods, etc. Expenditure on utilities by the extreme poor are slightly less than half that incurred by the nonpoor, indicating the limited access to services such as running

water, centralized heating, which are disproportionately enjoyed by the less poor and the nonpoor.

12. The poor households, particularly in rural areas, are likely be (i) larger households, with higher dependency ratios with more children under the age of 15 years; (ii) female headed/supported households with higher dependency ratios; (iii) unemployed/underemployed women heads or income earners; (iv) older household heads likely to face problems in the receipt of pensions and the lack of family labor for farming; (v) households' heads with lower than secondary education; and (vi) households headed by ethnic Kyrgyz and Uzbeks. This may be related to the urban nature of most Russian households, which also tend to be smaller.

13. That rural households have limited access to sanitation and safe water has important implications for health, particularly in a situation where State-supplied health services are limited and expensive on account of related out-of-pocket expenditures. Their relatively higher levels of reliance on burning coal, wood, manure, and crop residues for cooking and heating purposes, also have implications for respiratory system-related disorders. The poor have very limited access to basic services compared with the nonpoor. The rural areas and the rural poor receive lower quality services.

14. Rural areas, which had more or less equal rates of work participation by adults of working age with those of urban areas prior to the transition, have faced rates of decline that are twice those of the urban areas. The former state and collective farms maintained an entire infrastructure of support services that were crucial for women, children, and older persons in particular. These consisted of kindergartens, schools, hospitals, libraries etc., which were run largely by women staff. During the transition, these services have been drastically curtailed, and this has adversely affected women in two ways: (i) by reducing their formal sector employment drastically (31 percent compared with 24 percent of men); and (ii) by bringing back into greater focus their 'traditional' roles as family caregivers. While women's labor force participation rates increased between 1996 and 1997, the gap between them and their male counterparts remains at 11.4 percent. Unemployment rates of 53.5 percent for poor women are higher than the estimated 28.7 percent for poor men, indicative of the limited employment opportunities among poor women. However, women's self-employment in the supply of goods and services is increasing and households with self-employed earners are more likely to move out of poverty than those that are entirely dependent on own-account crop production and/or wage employment.

2. Agriculture

15. Agriculture is the main economic activity in the rural areas. Among the poor in the northern oblasts such as Chui, households are much more likely to have nonagricultural wage incomes compared with those in the south. Such incomes are approximately 60 percent of total incomes of the extremely poor and nonpoor households in the north, compared with 10 percent in the south for extremely poor households and approximately 35 percent for nonpoor southern households. Most wage incomes earned in the south are from agriculture, and this is associated with greater poverty.

16. Land ownership is an important determinant of household productive capacity and economic status. Almost all agricultural households have had access to some land since 1997. The most common forms of landholding are the household garden plots including small amounts of land used for orchards. The average garden plots are one fifth of a hectare. Cropland is available to approximately 60 percent of the rural households, and pasturelands

(common property) to about 13.3 percent.¹ While access to land is almost universal, the poor are more likely to have cropland and less likely to have pastureland than the nonpoor.² The average size of cropland shares is 1.7 ha and that for pasture is 0.9 ha. Overall, poor rural households have larger areas than nonpoor households do. This variation may relate to the larger number of children per poor household, leading to higher land allocation. However, the relative lower quality of land and the lack of access to resources to buy improved seed, fertilizers, etc. may impede agricultural improvements by poor households.

17. Most agricultural activity is subsistence oriented with several small-scale activities and most of the production going toward household consumption. The reform of the agriculture sector is recent and is still unfolding. It will be some time before it is clear as to where barriers to growth will continue to pose a challenge and which activities are likely to be the most profitable. In the meantime, a pattern of ongoing diversification in agricultural activities is evident. Among the nonwage activities, livestock raising and crop production are significant. The poor diversify less than the nonpoor, depending on fewer crops. This may reflect relatively lower levels of agricultural knowledge and skill, and dependence on the established crop rotations practiced during the socialist period, particularly among individual farmers who may not have backgrounds in farming. The poor and the extreme poor, like the nonpoor, also grow cash crops, perhaps more so than the nonpoor households. However, the land area they devote to cash crops may be much less than that cultivated by the nonpoor for such crops.

18. Agricultural production is hardly marketed. One third of crop-producing households do not sell any produce. For fruit and vegetables, less than half of the producers sell them. Wheat forms an important medium for meeting agricultural wages in kind, and payment of taxes and other barter arrangements. While barter is due to the demonitization of the economy, the persistence of barter needs to be better analyzed than at present. Factors other than the broader ones such as the overall lack of money in the rural economy and local governments may be responsible, including avoidance of taxes.

C. Situation In Chui Oblast

19. The social assessment prepared by the consultants gave the population of Chui Oblast as 768,000, of which 77 percent is classified as rural. The ethnic Kyrgyz is estimated at 40 percent of the total, which is lower than the national figure of 60 percent. In Chui, the poor form 47 percent of the total population and the extreme poor 10.3 percent. While the oblast figure is lower than the national figures, there is a high level of poverty and dependency in the rural areas. In 1997, the total labor pool comprised approximately 411,000 people, of whom 96.9 percent were recorded as employed. Official employment data tend to underestimate actual unemployment since not all unemployed are registered and many are underemployed. The fact that land titles are being issued creates an illusion of employment of the rural population.

¹ The rights of management of pasturelands, which constitute approximately 45 percent of the land area in the Kyrgyz Republic and are common property resources, have been devolved to village governments and the central Government appears to have abandoned its role in establishing guidelines for the allocation of grazing rights.

² The nonpoor, particularly minifarmers who are likely to be former dairy farmers/technicians of the former state and collective farms and who are allocated the livestock owned by these, are also allocated larger shares of pasturelands.

1. Poverty

20. The rural areas of Chui do not appear to show the kind of "abject" poverty that occurs in other parts of the Asian and Pacific Region. This is possibly due to the factors cited above as well as the reluctance of the people to admit to unemployment and poverty, and the availability of kinship and other support networks, including the unified peasant farms (UPFs) that continue to provide the social service support of the former state and collective farms. However, there has been a drastic fall in levels of living and well-being and an increase in vulnerability. The dimensions of poverty include at the extreme end the inability to provide sufficient nutrition for household members, as well as dearth of cash to meet costs associated with education, health, transport, clothing, etc. Pensioners in rural areas and households with larger numbers of children are more likely to be poor. The emergence of a market for land leases from individual farmers shows emerging social stratification among the rural population. On the other hand, possession of technical expertise in agriculture and related disciplines, access to household labor, farm machinery, livestock, and National Land Fund land (based, in many instances, on farmers' previous positions in the collective/state farms) are conditions for greater success in private production.

21. The elderly and pensioners who live alone are among the likely vulnerable categories largely due to their pensions being in arrears, as well as on account of the changes taking place in farming. With the gradual breakdown of collective farming, the elderly landowners may face a situation when tilling their land becomes a problem due to lack of household labor and the collapse of the production brigade system. So they are likely to remain with the UPFs until a better alternative is available.

22. There has been a marked deterioration in health conditions, with marked increases in cases of typhoid fever, tuberculosis, intestinal disorders, diphtheria, and sexually transmitted diseases. The health of children is reportedly a cause for concern. Because of the high costs of medicine, there seems to be a growing tendency to self-treat rather than go to allopathic doctors.

23. Education includes preschool establishments or kindergartens. These decreased drastically in Chui (335 to 79) between 1991 and 1997. In the farming communities visited during project preparation, there were no functioning kindergartens. While the number of schools and teachers decreased marginally, the number of schoolchildren increased by approximately 5,000. In rural areas, classrooms were reported to be overcrowded on account of fewer schools, and fewer teachers compared with the new entrants in the schools. Again another factor that may adversely affect education is the prevalence of poor households that cannot afford more than the lower secondary education for their children and believe that children can contribute toward the household income. The consultants' social assessment showed that 35.2 percent gave those reasons for keeping children away from schools.

2. Land Ownership

24. The situation regarding the emergence of individual and peasant farms is in flux. On the one hand, the process of allocating land titles is almost complete; yet on the other hand, there is a prevalence of a variety of farming entities most of them temporary in nature. Many peasant farms are in fact made up of individual private farmers who are informally farming collectively. There are minifarmers who have taken their share of livestock but maintain their land in the UPF. There are UPFs that are registered with the raion statistical committee, but are not registered as private enterprises and are still operating with two stamps. There are private

farmers who have taken their land share but have leased it to others for a year while they continue with their salaried positions within the UPF. Leasing transactions between private farmers is done informally in recognition of the short nature of the leases and the transaction costs involved in changing ownership.

25. Another dimension of the land reform process relates to women's land rights. Women can have land titles but these generally form part of the total household land. While under the Project, there will be little control over whether women's landholdings are clearly demarcated and certificates given to them (although their holdings would for operational purposes form part of the household's total land), it will be necessary to monitor the impacts of the process in project areas and identify issues that need to be further elaborated in the land reform process.

26. There are some emerging trends in landownership and production arrangements that are likely to be significant for the Project. For example, some farming households tend to break away from old arrangements and farm independently. On the other hand, various types of arrangements for cooperation are emerging which are clearly aimed at dealing with the constraints that individual farmers face in carrying on with agricultural activities. These cooperative arrangements are clearest in the form of the reorganized peasant associations where individual farmers come together for a variety of reasons, including the need to rationalize the use and maintenance of farm machinery, overcome problems of tax payments and payments for services, salaries etc. Cooperation between peasant farm associations and UPFs may result from the need to share social infrastructure such as schools, hospitals, workshops, bakeries, etc., as well as livestock herds if these are not fully distributed. Another factor is related to crop planning. Given the lack of technical advisory services for agriculture, the need to cooperate so as to plan cropping rotation, irrigation, machinery allocation, marketing, etc., is also evident. Cooperation of this sort may be achieved by the setting up of a nonlegal entity such as a UPF based on elections. This is the system prevailing in some successful farms in Kolos, Sokulok raion. The new system has similarities with the previous system and structures in terms of control over resources and decision making.

27. In other instances, the individual farmers may work together with their neighbors to ensure irrigation and access to farm machinery supplies and inputs, etc. Labor-deficient households may pool their resources with their neighbors to ensure timely operations. There are several instances and ethnicity did not appear to be a significant factor in determining such cooperative relations. However, kinship and community ties appear to be important in financial dealings as regards informal credit transactions as well as for social occasions. Among the Kyrgyz, identification along patrilineal clans is important and forms the basis of the mutual support system that is important for livestock management as well as for providing a support base for vulnerable households. However, it does not appear that ethnic divisions would hinder farm-level cooperation and group formation for production purposes.

28. Another persistent trend is for individual farmers to continue to maintain some links with the UPFs. This is due to the overall uncertainty of agricultural production and access to services. These farms still provide access, however limited, to technical support (on a rapidly declining basis), social infrastructure, basic subsistence through grain-based salary and dividend payments, as well as emergency assistance for household survival. For labor-deficient households such as those with too many young children, the option of being able to handle part of their land as an individual plot and leave the rest within the UPF is a way of overcoming a labor shortage. The same is the case with households that lack the minimum resources or farming know-how to carry out farming on their entire landholding. There is also an important rationale for the maintenance of some sort of collective arrangement, whereby the landholdings

of pensioners who are alone and cannot cultivate can be farmed and these people can receive a dividend based on their landholding. In the absence of any such arrangement, the question of the management of land shares of pensioners will emerge as a significant one, both from the point of view of meeting the needs of pensioners, as well as the organization of production on a significant area of land.

29. A market for land leases has emerged on account of the presence of households that have received land but may not have the wherewithal to cultivate their entire holding, or pay taxes. The period of leasing of land, whether from the National Land Fund (NLF) or from private sources, is variable. The lease rates for NLF land appear not to have been fully fixed as yet and vary from Som388 to Som450 per annum for irrigated lands. The private lease costs are more or less similar.

30. The situation as regards the restructuring of landholdings is complex and still unfolding. However, the priorities of the farming population in a situation of low profitability, subsistence production, severely limited access to services and inputs and markets, and lower social protection are likely to lead to continuing uncertainty over the final pattern of landholding and the shape of agricultural production organizations. The Project will need to work within the evolving situation, work with a variety of farming entities in ways that may help improve the viability of individual farms/newly emerging forms of cooperation between individual farms, etc. While the direction of change is clearly toward individual production, the Project needs to develop interventions that can help the farming community to get over some of the obstacles outlined above. Individual farmers constitute a growing percentage of the farming community and they require assistance to form their own organizations/groups that can, over a period of time, evolve into strong producer organizations/service agencies. Such farmer organizations can eventually replace the former state and collective farms in terms of providing services with economies of scale and geared to new markets and farming activities. The basis for such organization will vary from context to context. However, certain common principles can be identified: (i) commonality of purpose; (ii) socioeconomic compatibility; (iii) willingness to participate; and (iv) training and capacity building by the agency capable of providing support and guidance in group formation, consolidation, and strengthening.

3. Development of Organizations

31. There is an urgent need to support and facilitate the emergence of credible organizational alternatives. This is closely related to the organization of social and economic services, issues of developing norms for the membership of such groups to ensure equitable access, and capacity building to deal with new social and economic imperatives.

32. Among rural communities there are two sources of potential support for the development of new organizations: the traditional kinship-based support systems of the Kyrgyz who constitute approximately 52 percent of the population, and the soviet experience of working in mixed groups. The strong role and contribution of social support networks and social solidarity among the farming population in providing mutual help to deal with problems related to both economic and social spheres are evident. Cooperation between farmers mostly focusing on the sharing of irrigation waters, mobilizing farm machinery, marketing of produce, and purchase of inputs is increasing. Such cooperation exists at several levels, and the family and clan based group is the immediate basis for organizing joint-farm-level activities as well as for borrowing. However, in situations where farmers of different ethnic backgrounds have to work together, the absence of ethnic similarities does not appear to be a major hindrance to farm-level cooperation. This is

based on the soviet experience of working in mixed production brigades on the collective/state farms. Such brigades continue in the reorganized UPFs, albeit with a much reduced strength.

33. The Project will attempt to promote and facilitate the promotion of farm and business activities. The first step in this direction will be the formation of group organizations such as water user associations, producer organizations, and service organizations. The Project will work principally through the Rural Advisory and Development Service Foundation. There will be a public education campaign that will include information dissemination to rural communities regarding the project objectives and strategies, and such topics as the need to organize groups based on specific needs and functions, support that the Project will provide to potential groups including training and capacity building, assistance in developing technical capability and business planning, and access to financial and other resources. The Project will provide equal opportunities to all farming members of rural communities in the project area to join such groups and participate in project activities. The groups will undergo training, a preregistration phase, which will help consolidation, followed by registration under the appropriate legal frameworks.

D. Gender Issues

34. Since Independence in 1990, there has been a tremendous growth of poverty and social disadvantage, and among the groups most affected are the women. While both men and women have experienced growing poverty, unemployment, and the weakening social support and social services, the effects on women appear to have been more severe. Because of the decline in child care and health services, women have simultaneously lost jobs and been faced with increasing family responsibilities to provide care for the elderly and the children. Female-headed households with a larger number of children are among the vulnerable and disadvantaged groups. However, women have consistently supported the reform process and have responded to the economic opportunities in the emerging informal sector. Female-headed households with few children may actually do better economically than others because the women's entrepreneurial activities provide the rural households with much needed incomes, which may be a buffer against extreme poverty. In rural communities in Chui, women of all ethnic groups play significant roles in productive work. The Kyrgyz communities inhabiting the northern oblasts are less conservative than those in the southern oblasts, and their women continue to play significant roles in economic activities.

35. The Government realizes the importance of ensuring that an equitable policy and legal framework for women in the Republic exists to provide them with full opportunities to participate in the economic and social development of the country. Women in the Republic formally have equal rights with men in all spheres of the society and economy, in both legal and material terms. Gender equality in the FSU was established, with special policies promoting the position of women such as quota representation, social allowances for women, and special social infrastructure targeted to women. In 1996, the Government ratified the Convention for the Elimination of All Forms of Discrimination against Women.

36. As regards access to land shares, as stated earlier, women are legally entitled to own and inherit their own landholdings. However, the process of privatization and distribution of land shares in agricultural and pastureland tends to favor men over women. An exception to this may be the urban garden or dacha farming in which women have been actively involved. In many ways, the developing male-oriented ownership pattern reflects a Kyrgyz tradition whereby men were the proprietors of land and animals. It is more common to find women owning property in urban areas than in the rural areas. The Government's AYALZAT Committee on Women has identified the growing trend toward gender-biased property distribution as a major concern. It is

evident that while women have land titles, these are merged into the family's holdings in the case of individual farms, or are part of the UPFs. The exceptions are women heads of households who as individual farmers farm their own landholding. On the UPFs, women do not form part of the production brigades.

37. For the Project to ensure gender equity and provide equal opportunities to women, it is important that women be given the opportunity to control their landholding irrespective of specific farming arrangements they may enter into. Women will have full opportunity to participate in project activities by joining the new groups/organizations that will be formed, and will undergo training and capacity building to carry out group functions efficiently. The Project will give equal membership to men and women from participating households so that both are able to run the affairs of their groups without problems.

38. The Project will also facilitate the building of strategic relationships with other programs and projects, particularly in providing the poorer farmers with increased access to credit and savings. Credit windows are opened under the Project at KAFC and empowerment of the poor and women is promoted through building the capacity of community organizations. Through the availability of such support, women of households that are poor and unable to participate in project activities on account of their lack of creditworthiness will be assisted to increase their incomes through access to savings and credit instruments.

E. Social Impact

39. The Project is expected to have positive social impacts on the rural farming communities in Chui and on poor households and women. By promoting the development of producer/service enterprises among the farming communities; improving the viability of farms through improved business planning; and providing access to credit, technical services, inputs and markets, the Project will help to increase rural incomes. In this way the Project will help to reduce poverty in the rural areas of Chui. At least 25 percent of the project beneficiaries are likely to be poor farming households, given the high levels of poverty prevailing among the rural communities. By adopting a process approach, the Project will help poor households participate by providing opportunities for improving capabilities and incomes.

40. The Project is expected to benefit the women of rural communities by improving their access to new producer organizations and financial services through linkages to be developed with other agencies. Women entrepreneurs are likely to benefit from participating in the development of new services for farming communities. Monitoring and evaluation of project impacts will systematically measure the impacts on women in terms of their access to land, participation in new organizations, training programs, income levels and savings.

TECHNICAL ASSISTANCE FOR INSTITUTIONAL STRENGTHENING IN PLANNING AND MANAGEMENT OF AGRICULTURAL DEVELOPMENT

A. Objectives and Scope

1. The objective of the technical assistance (TA) is to assist the Chui Oblast administration (COA) to develop appropriate approaches, systems, and procedures for the planning and management of agriculture development in the region. In particular, the TA will strengthen the capacity to design, develop, implement, and monitor agricultural and rural development projects, with particular regard to the Agriculture Area Development Project (AADP) and other project interventions, and improve linkages between oblast institutions and the Ministry of Agriculture and Water Resources (MAWR).
2. The TA will focus on (i) developing an approach to planning and management that is appropriate to the institutional and resource capacity of COA; (ii) developing coordination strategies and arrangements to optimize the effectiveness of development activities in the region; and (iii) developing systems and procedures for planning, budgeting, and monitoring financial and implementation activities.

B. Consultants

3. The Asian Development Bank (ADB) will engage two international consultants and one domestic consultant to provide 44 person-months of consulting services (24 international and 20 domestic).

1. Team Leader/Regional Planner (18 person-months, International)

4. The team leader/regional planner will assist COA to
 - (i) review the current approach, systems, and procedures for planning, budgeting, implementing, and monitoring development activities in the Chui Oblast.
 - (ii) based on the review, make recommendations for changes in the immediate term (1-2 years) and in the longer term (5-7 years).
 - (iii) establish a mechanism to coordinate funding agency activities and projects supporting agricultural and rural development in the oblast, including the establishment of effective linkages between AADP and other national and local projects (in particular, the Agricultural Support Services Project/Rural Advisory and Development Service, Irrigation Rehabilitation Project, On-Farm Irrigation Project, Rural Finance Project, and Rural Financial Institutions Project).
 - (iv) cooperate with AADP staff to design and implement a farm baseline survey in the oblast and annual monitoring surveys, develop arrangements to institutionalize the survey (with the National Statistics Committee and MAWR), and assist with the selection of farms to participate in AADP.
 - (v) establish arrangements to coordinate the provision of credit for agricultural and rural development in the oblast by the Kyrgyz Agricultural Finance Corporation, credit unions, and nongovernment organizations, including the development of effective linkages with AADP.

- (vi) establish arrangements to develop support by private sector financing institutions (Central Asia American Enterprise Development Fund, International Bank for Reconstruction and Development, International Finance Corporation, and ADB's Private Sector Group) for the development of private sector farm services and agribusiness enterprises, including the provision of financing for AADP-related activities (input supply, marketing, machinery hire services, and export marketing).
- (vii) coordinate the development of training for agricultural and rural development in the oblast, improve linkages between project-related training and existing training institutions such as the Kyrgyz Agrarian Academy, agricultural technicums, and vocational training schools, including AADP-supported training activities.
- (viii) identify priority areas and needs for additional funding agency support for agricultural and rural development in the oblast.
- (ix) establish effective linkages with other oblasts to strengthen and support the design, development and implementation of area-based agricultural and rural development projects and their integration with national projects.

2. Budgeting and Financial Specialist (6 person-months, International)

5. The budgeting and financial specialist will work closely with the financial staff of the oblast and will be responsible for setting up a financial and management reporting system suitable for planning and managing project activities. In particular, the budgeting and financial specialist will

- (i) review the oblast's current financial system and systems used elsewhere in the Government, set up an appropriate financial system including procedures, formats, etc., and prepare a manual to be used in project management.
- (ii) train oblast staff and relevant project staff in the new system.
- (iii) provide specific assistance and training for staff involved with the AADP, with particular attention to management of the project account, withdrawal applications, statement of expenditures, and preparation of progress reports in accordance with ADB requirements.

3. Agricultural Economist/Regional Planner (20 person-months, Domestic)

6. The agricultural economist/regional planner will work closely with the team leader/regional planner. He/she will pay particular attention to the following tasks:

- (i) Design and implement the baseline survey and annual monitoring surveys.
- (ii) Assist with the training of staff in the processes and procedures of project planning and implementation, with particular reference to the AADP.
- (iii) Assist the staff in the preparation of a regional agriculture and rural development program.

C. Cost Estimates

7. The cost of the TA is estimated at \$941,210 equivalent, of which \$689,300 will be the foreign exchange cost and \$251,910 equivalent will be the local currency cost. It is proposed that ADB finance \$800,000 to cover the entire foreign exchange cost and \$110,700 equivalent of the local currency cost. The Government will finance the remaining \$141,210 equivalent of local currency cost (Table A8).

D. Implementation Arrangements

8. The Executing Agency of the TA will be MAWR. COA will implement the TA. The steering committee for the AADP will also oversee the implementation of the TA and review the reports of the TA. COA will provide counterpart staff in areas complementary to those of the consultant team.

9. ADB will engage individual consultants in accordance with ADB's *Guidelines on the Use of Consultants*.

E. Implementation Schedule, Reports, and Documents

10. The TA will commence at the beginning of the project implementation period and will have a duration of 20 months. The consultants will submit an inception report to the project steering committee and ADB after one month, quarterly progress reports, a draft final report at the end of 17 months, and a final report at the end of 20 months.

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

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank Financing			
1. Consultants (Remuneration and Out-of-Pocket Expenses)			
a. International Consultants	595.20	0.00	595.20
b. Domestic Consultants	0.00	40.20	40.20
2. Equipment	33.00	12.00	45.00
3. Seminars, Workshops, and Training	0.00	0.00	0.00
4. Studies, Surveys, and Documents	0.00	0.00	0.00
5. Contract Negotiations	0.00	0.00	0.00
6. Miscellaneous TA Administration and Support Costs	0.00	48.80	48.80
7. Contingency	61.10	9.70	70.80
Subtotal (A)	689.30	110.70	800.00
B. Government Financing			
1. Counterpart Staff	0.00	12.60	12.60
2. Support Services	0.00	103.60	103.60
3. Contingency	0.00	25.01	25.01
Subtotal (B)	0.00	141.21	141.21
Total	689.30	251.91	941.21

Source: Staff estimates.

FINANCIAL AND ECONOMIC ANALYSES

A. Introduction

1. The financial analysis focuses only on the viability of the representative farm models envisaged to evolve under the Project. The economic analysis, in contrast, was carried out on the Project as a whole covering all four components. As project components are interdependent in terms of benefit impacts, the project economic analysis was not conducted for individual components. The project life is assumed at 25 years, including an implementation period of 6 years. Economic costs and benefits are expressed in the domestic price numeraire.

B. Assumptions

2. It is difficult to know for certain the configuration of farms that may evolve within the project area. The process of land and agrarian reform has broken up former state and collective farms, into various structures. For the purpose of the financial analysis, three representative farm models were identified as likely farm structures that may evolve and be financially viable and sustainable. These are (i) large farms of about 850 hectares (ha), (ii) medium farms of about 65 ha, and (iii) small farms of about 7 ha. It was further assumed that each representative farm would have an irrigated land area of about 70 percent and nonirrigated land area of 30 percent.

3. Costs included incremental investment costs, working capital requirements, and operating costs incurred by each representative farm. Investment costs were capital investment in farm machinery and equipment. A medium-term credit line provided by the Project will be channeled through the Kyrgyz Agricultural Finance Corporation (KAFC) and made available to qualified borrowers at 36 percent interest per annum payable over three years. Investment in all farm types was to be undertaken in the third year of individual farm restructuring after the farmers had undergone training on the technical and business aspects of farming, and works on drainage and irrigation rehabilitation were under way. Working capital requirements were likewise assumed to be borrowed from KAFC at 36 percent per annum, payable within one year. Operating costs consist of direct crop and livestock production costs and other operating costs such as utilities, transportation, administration, fixed expenses, and irrigation fees (including water tariff, costs incurred in operation and maintenance [O&M] of on-farm drainage and irrigation facilities, recovery of rehabilitation investment for on-farm drainage and irrigation facilities.

4. The water tariff¹ was assumed to increase from the current rate of Som0.03 per cubic meter (m³) (Som128/ha, about \$3.05/ha),² in year 1, to Som0.10/ m³ (Som425/ha, about \$10.12/ha),³ in year 6, under the with-Project situation. O&M of on-farm drainage and irrigation facilities was estimated at Som425/ha⁴ (\$10.12/ha) under the with-Project situation compared

¹ The water tariff is the amount collected by the Government from beneficiaries of the irrigation service to recover off-farm operation and maintenance (O&M) costs associated with the delivery of water to the farm level.

² At Som42 = \$1.00.

³ Full recovery of O&M of farm-level drainage and irrigation facilities was estimated at Som425/ha based on the ADB Preappraisal Mission Report of the Rural Engineer Specialist, *Irrigation Diagnostic Survey*, 3 July 1999. The yearly increase in water tariff is based on the recommendation of the Kyrgyz Government, presented in the Final Report, Annex 4, *Water Resources Institutional Development*, May 1999 of *Agricultural Area Development Project* (TA 3017-KGZ).

⁴ Estimate obtained from the ADB Preappraisal Mission Report of the Rural Engineer Specialist, *Irrigation Diagnostic Survey*, 3 July 1999.

with Som100/ha (\$2.38/ha) under the without-Project situation.⁵ In the with-Project scenario, it was further assumed that farms would start making payments on the 25 percent of the investment in the rehabilitation of on-farm drainage and irrigation facilities in year 6, after a grace period of five years. Farmer payments on rehabilitation investment were projected to increase annually until year 11 when the full amount required for investment recovery was envisaged to be applied by the Department of Water Resources (DWR). The amount to be recovered was calculated based on the yearly investments in on-farm drainage and irrigation rehabilitation, design and planning, and on-farm soil protection. Each of the yearly rehabilitation investments made over the six-year period of project implementation was annualized, on a per-ha basis, over an economic life of 25 years. The schedule of payments on the water tariff is presented in Table A9.1.

Table A9.1: Schedule of Water Tariff Payments, O&M Costs, and Investment Recovery (Som/ha)

Item	Yr11	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11-25
WTP ^a	128	128	170	255	340	425	425	425	425	425	425
O&M ^b	425	425	425	425	425	425	425	425	425	425	425
Recovery on investment						75	153	232	310	388	467
Total^c	553	553	595	680	765	925	1,003	1,082	1,160	1,238	1,317

WTP = water tariff payments.

^a Per hectare water tariff payments for O&M to be paid every year.

^b O&M of on-farm drainage and irrigation facilities.

^c Total cost incurred by farms, which includes WTP, O&M, and investment cost recovery.

5. An average yield estimate for each type of crop and livestock was applied in the farm budgets for each farm type. The estimated average crop and livestock yields are presented in Table A9.2. While a further drop in yields might be expected due to a continuing deterioration in conditions, the assumption of current yields in the without-Project scenario is more conservative. Crop yields, and consequently crop production, under the with-Project situation, were projected to increase and level off at full development in year 7. Yields are expected to remain at the full development level until year 25.

Table A9.2: Crop and Livestock Yields (mt/ha)

Crop/Livestock Product	Without Project	With Project						
	Year 1-10	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7-25
Wheat	1.9	2.30	2.76	3.31	3.97	3.97	3.97	3.97
Maize	3.3	3.63	3.99	4.39	4.83	5.00	5.00	5.00
Sugarbeet	15.0	16.00	19.00	20.00	21.00	22.00	23.00	23.00
Sunflower	0.9	1.00	1.10	1.20	1.30	1.40	1.40	1.40
Potatoes	9.0	10.00	11.00	12.00	13.00	14.00	15.00	15.00
Onions	7.0	9.00	11.00	13.00	15.00	18.00	20.00	22.00
Barley	0.75	2.10	2.20	2.25	2.35	2.45	2.65	2.95
Milk (liters/cow/yr)	1,200	1,600	1,700	1,900	2,100	2,200	2,200	2,200
Beef (kg/yr) ^a	120	150	165	173	180	180	180	180

Kg = kilogram, t = metric ton, yr = year

6. Under the without-Project situation, crop and livestock production were assumed at about 150,000 tons (t) and 20,000 t, respectively, based on current yields. Total crop production is expected to increase from about 55,000 t in year 1 to about 348,000 t in year 7, under the

⁵ The cost of O&M of on-farm drainage and irrigation facilities refers to the amount spent by individual farms on the maintenance, repair, and management of these facilities.

with-Project situation, while livestock production is projected to increase from about 24,000 t in year 1 to about 34,000 t in year 7. Incremental production at full development is projected at about 198,000 t and about 15,000 t, for crop and livestock, respectively (Table A9.3).⁶

Table A9.3: Incremental Production
(t)

Product	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7-25
With Project:							
All Crops	55,390	103,619	165,457	234,235	330,422	348,076	348,076
Livestock Products	23,965	25,638	28,718	31,815	34,098	34,426	34,426
Total with Project	79,355	129,257	194,175	266,050	364,520	382,502	382,502
Without Project:							
All crops	149,784	149,784	149,784	149,784	149,784	149,784	149,784
Livestock Products	19,532	19,532	19,532	19,532	19,532	19,532	19,532
Total without Project	169,316	169,316	169,316	169,316	169,316	169,316	169,316
Inc'l Crop Production	-94,394	-46,165	15,673	84,451	180,638	198,292	198,292
Inc'l Livestock Production	4,433	6,106	9,186	12,293	14,566	14,894	14,894
Incremental Production	-89,961	-40,059	24,859	96,744	195,204	213,186	213,186

7. Farm area development and, subsequently, benefits under the with-Project situation would be phased following the assumed rehabilitation schedule of drainage and irrigation, and would gradually increase each year until full development is attained in year 7.

C. Financial Analysis

1. Financial Viability of Representative Farms

8. The financial analysis of each representative farm was based on farm budgets and the comparison of the with- and without-Project situations over a period of 10 years. The incremental revenues were based on the difference between the projected crop yields and livestock production under the with- and without-Project situations which were valued using financial farmgate prices. The price of domestically produced wheat, which competes with American wheat in the Russian market, was based on its import parity farmgate price, while all other crop and livestock farm products were valued based on their financial farmgate prices as they were assumed to be nontradable. Except for fertilizers, the prices of the production inputs were based on market prices (Table A9.4). The resulting farm budgets are presented in Table A9.5.

9. The results of the financial analysis indicate that each representative farm type is financially viable. The calculated financial internal rates of return (FIRRs), after financing, were estimated at 7.4 percent for large farms, 10.3 percent for medium farms, and 9 percent for small farms (Table A9.6). The after-financing FIRR includes financing for working capital and investment loans, and cost recovery for full O&M costs, water fees, and 25 percent of the cost of rehabilitation of drainage and irrigation.

⁶ As farm area development follows the rehabilitation of on-farm irrigation facilities, crop production across all farms under the with-Project situation is projected to increase from year 1 to year 6. It is assumed that 100 percent cultivation of irrigated land on all farms will be attained in year 6. Overall, incremental crop production in years 1 and 6 there is negative, as some farms will experience disruption of farm operations due to rehabilitation works.

2. Financial Performance of All Farms

10. The financial analysis was extended to determine the financial performance of all farms under the Project. Of a total on-farm irrigated land area of 55,000 ha covered under the Project, about 36 percent was assumed to be farmed by large farms, 24 percent by medium farms, and 40 percent by small farms. Based on the average irrigated area assumed for each representative farm type, there is an estimated total of 33 large farms, 293 medium farms, and about 4,400 small farms. With the trend toward farm privatization and with the restructuring process leading to breakup and amalgamation, it was assumed by the end of project implementation, the number of large farms would decrease to 16. The number of medium farms will increase to 407, and small farms will increase to 5,420. It was also assumed that about 75 percent of all farms in the project area would attain full development. The remaining 25 percent will benefit mainly from drainage and irrigation and could be more constrained in accessing financing to fully utilize all the available benefits of the Project.

11. The calculated financial incremental revenue and cost streams of each farm type were derived from their respective farm budgets and were projected over a 25-year period to determine the financial viability of all farms under the Project. Farm machinery and equipment were assumed to be replaced every 10 years, with initial investments made on the third year of farm development. The overall FIRR for farms reaching full development was estimated at 17.6 percent.

D. Economic Analysis

12. The economic analysis also required a comparison of the Project's economic viability with and without the Project based on estimates of (i) project investments; (ii) incremental costs associated with the on-farm drainage and irrigation facilities, including O&M, water tariff, and recovery of rehabilitation investment; and (iii) incremental costs and benefits associated with crop and livestock production. The overall economic evaluation of the whole Project was undertaken by applying ADB's *Guidelines for Economic Analysis of Projects*. All costs and benefits were expressed in 1999 constant prices. The economic life of the Project was assumed at 25 years.

1. Calculation of Economic Costs

13. Investment and recurrent costs were segregated into their foreign and local currency components based on the percentage distribution of foreign and local cost estimates. Local costs were broken down into their nontraded and labor components and were brought to the domestic price numeraire using financial prices net of taxes, duties, and subsidies. Traded components were brought to the domestic price numeraire using a shadow exchange rate of Som44.21 to \$1.00, based on a shadow exchange rate factor of 1.053⁷ and the prevailing exchange rate of Som42 to \$1.00.

14. General labor conditions exhibit significant unemployment and underemployment. Most of the unemployed workforce is relatively unskilled, having previously worked as farm laborers

⁷ This implies a standard conversion factor (SCF) of 0.95. The World Bank Agricultural Support Services Project assumed no distortions and used an SCF of 1.0 in the conduct of the economic analysis for the project. The project preparatory TA used an SCF of 0.91-0.98 for converting investments in irrigation to economic values. For the purpose of carrying out the economic analysis for the Project, an SCF of 0.95 was used. This seems a realistic estimate, particularly in view of the reforms and liberalization of prices initiated by the Government.

or as clerical staff within rural enterprises. The rural market is seasonal but, given the high levels of underemployment, there is no prospect of labor shortages during harvest periods. On balance, it was assumed that the opportunity cost of unskilled labor was lower than the wage rate, with a shadow wage rate of 0.6.

2. Calculation of Economic Benefits

15. The incremental benefit streams derived from the financial analysis of the three representative farm types were converted to economic values, using the calculated economic parity prices for wheat and fertilizers, and served as the basis for estimating the incremental economic benefits generated by the Project. As all other farm products and production inputs were assumed to be nontradable, their corresponding farmgate economic prices, net of taxes, were used in the economic valuation.

16. The resulting net present value (NPV) showed that the Project is expected to generate approximately Som503 million for the economy. The Project is expected to realize an economic internal rate of return (EIRR) of about 15 percent. The economic cost-benefit flows, EIRR, and NPV are shown in Table A9.7.

E. Sensitivity Analysis

17. A sensitivity analysis was undertaken to determine the effect of variations in the estimated costs and benefits of the Project (Table A9.8). Switching values, for EIRR to equal 12 percent, indicate that the overall Project EIRR is highly sensitive to decreases in crop revenue and crop yields. As crops comprise a significant proportion of total farm revenue, the sustained economic viability of the Project largely depends on the improvement and sustainability of crop yields. It is therefore important to select farms with high potential for diversified and sustained crop development. The EIRR is relatively insensitive to decreases in livestock revenue and irrigated area as well as to increases in production cost. A delay in the generation of benefits by two years resulted in a recalculated EIRR of about 13 percent.

F. Effect on Farm Incomes

18. About 12 large farms, 305 medium farms, and 4,065 small farms, or about 8,000 farm households (about 30,000 persons) on about 59,000 ha, are expected to attain full development and fully utilize all the benefits available under the Project. Net farm income per ha of irrigated land at present is estimated to be Som651 (\$15.50), Som698 (\$16.63), and Som810 (\$19.29) for large, medium, and small farms, respectively. The Project is expected to bring about a threefold increase in net farm income per hectare with an incremental annual net farm income estimated at Som2,071/ha (\$49.30/ha) for large farms, Som2,480/ha (\$59.04/ha) for medium farms, and Som2,011/ha (\$47.88/ha) for small farms. In addition, farms (about 2,600 families or about 10,000 persons) on another 19,000 ha will benefit to a lesser extent as they are expected to be constrained in gaining full access to all project benefits, particularly access to working capital and investment loans. These farms will benefit mainly from drainage and irrigation and are expected to realize an increase of about 20 percent in annual net farm income or an incremental income of about Som130/ha (\$3.10/ha) for large farms, Som140/ha (\$3.32/ha) for medium farms, and Som162/ha (\$3.86/ha) for small farms.

G. Nonquantifiable Benefits

19. The project benefits are far broader than those quantified above. Strengthened input and output market linkages are envisaged to have significant positive impacts on farm production as well as on the marketing of farm commodities, and, consequently, on farm incomes. The Project also finances institutional strengthening and training of MAWR and DWR staff in project management, irrigation management, and farming technology which, in turn, may generate positive impacts beyond the designated project area. In light of the existence of unquantified benefits, the estimated economic benefits in the preceding sections, accordingly, should be taken as a conservative rather than an optimistic estimate.

20. Higher productivity levels will increase farm incomes and enable farms to implement sustainable practices rather than practices leading to continued resource degradation. The improvement in farmers' incomes is further envisaged to improve the purchasing power in the project area and, as a consequence, generate more cash in the economy. This will significantly reduce farmers' dependence on barter trade and subsequently reduce transaction costs in the marketing of commodities. The increased incomes in rural communities may also result in the deceleration of migration to the urban areas.

21. The Project is expected to have a significant positive effect on the environment since the agricultural techniques currently practiced are adversely affecting the soils and have resulted in increased salinity, alkalinity, waterlogging, and erosion. Improvements in farming techniques, particularly the optimal use of fertilizer and chemicals, will certainly reduce the occurrence of soil salinity or alkalinity. Better irrigation management and regular O&M of off- and on-farm drainage and irrigation facilities, including the establishment of on-farm soil protection and erosion facilities, will minimize waterlogging and soil erosion problems as well as wasteful use of water.

H. Fiscal Impact Analysis

22. A fiscal impact analysis was undertaken to determine the effect of the Project on the Government's yearly budgetary allocations before and after the Project. This required the determination and estimation of incremental revenues and expenditures associated with Project implementation. For purposes of the analysis, total revenues were assumed to be derived mainly from (i) collections on water tariff and investment cost recovery; (ii) investment goods tax on civil works, estimated at about 10 percent; and (iii) import tax on fertilizers and agrochemicals, also at 10 percent. Expenditures were estimated based on the total Project investment cost and O&M cost of irrigation facilities. Under a scenario in which the Government was assumed to bear all of the investment costs (i.e., before financing), the Government budget would need to provide additional budgetary allocations. However, the ADB's assistance for Project financing eliminates this burden on the Government and no additional budgetary allocations will be necessary to cover costs incurred during the implementation of the Project. The net effect is shown in Table A9.9.

Table A9.4: Financial and Economic Prices

Appendix 9, page 7

Item	Unit	Wheat	Nitrogen	Phosphate	Potassium
FOB, port of origin (1990 constant)	\$/ton	122.10 ^a	81.10 ^b	152.60 ^c	114.50 ^d
MUV multiplier 1.0482					
FOB, port of origin (1999 constant) ^e	\$/ton	127.99	85.01	159.96	120.02
Freight and insurance to St. Petersburg, Russia	\$/ton	30.00		25.00	40.00
CIF price at St. Petersburg, Russia	\$/ton	157.99			
Port handling charges and storage costs at St. Petersburg	\$/ton	5.00			
Transport, loading, unloading and insurance costs to Moscow	\$/ton	20.00			
Landed price of American wheat in Moscow ^f	\$/ton	182.99			
Less: 15% quality adjustment for Kazakhstan's wheat ^f	\$/ton	27.45			
Kazakhstan's wheat-average grades, in Moscow region	\$/ton	155.54			
Less: Transport, handling and insurance (Kazakhstan-Moscow)	\$/ton	40.00			
Kazakhstan's export parity border price ^g	\$/ton	115.54			
Transport, handling and insurance to Kyrgyz Republic ^h	\$/ton	25.00			
Landed price of wheat at Kyrgyzstan's border	\$/ton	140.54			
Fertilizer freight and insurance to Kyrgyz Republic			65.00	65.00	65.00
Fertilizer CIF price at Kyrgyzstan border			150.01	224.96	185.02
Wheat Financial Prices	\$/ton				
Importer's costs, handling and margin 10% of landed price	\$/ton	14.05			
Wholesale price, equivalent to price at elevators	\$/ton	154.59			
Storage, losses and drying costs	\$/ton	10.00			
Less: Transport, loading and unloading-farms to elevators ⁱ	\$/ton	15.00			
Financial import parity farmgate price	\$/ton	129.59			
Financial import parity farmgate price	\$/kg	0.130			
Financial import parity farmgate price ^j	Som/ton	5,443			
Financial import parity farmgate price ^j	Som/kg	5.44			
Fertilizer Financial Prices					
Handling, storage and losses, 5% of CIF price	\$/ton		7.50	12.50	11.25
Wholesale importer's margin, 10% of CIF price	\$/ton		15.00	25.00	22.50
Wholesale price ^e	\$/ton		172.51	287.45	258.77
Transport, loading and unloading to retailers ^k	\$/ton		30.00	30.00	30.00
Retailer's margin, 10% of wholesale price and transport, loading, and unloading	\$/ton		20.25	31.74	28.88
Import parity farmgate price	\$/ton		222.76	349.19	317.65
Nutrient content			46%	46%	60%
Financial import parity farmgate price of fertilizer nutrient	\$/ton		484.26	759.12	529.41
Financial import parity farmgate price per kg of fertilizer nutrient	\$/kg		0.48	0.76	0.53
Financial import parity farmgate price per kg of fertilizer nutrient ^j	Som/kg		20.34	31.88	22.24
Wheat Economic Prices					
Importer's costs, handling and margin		12.65			
Wholesale price, equivalent to price at elevators		153.19			
Storage, losses and drying costs		9.00			
Less: Transport, loading and unloading-farms to elevators ⁱ		13.50			
Economic import parity farmgate price	\$/ton	130.69			
Economic import parity farmgate price	\$/kg	0.131			
Economic import parity farmgate price ^j	Som/ton	5,489			
Economic import parity farmgate price ^j	Som/kg	5.49			
Fertilizer Economic Prices					
Handling, storage and losses	\$/ton		6.75	11.25	10.13
Wholesale importer's margin	\$/ton		13.50	22.50	20.25
Wholesale price ^e	\$/ton		170.26	283.70	255.40
Transport, loading and unloading to retailers ^k	\$/ton		27.00	27.00	27.00
Retailer's margin	\$/ton		18.23	28.57	25.99
Import parity farmgate price	\$/ton		215.49	339.27	308.39
Economic import parity farmgate price of fertilizer nutrient	\$/ton		468.45	737.54	513.98
Economic import parity farmgate price per kg of fertilizer nutrient	\$/kg		0.47	0.74	0.51
Economic import parity farmgate price per kg of fertilizer nutrient ^j	Som/kg		19.67	30.98	21.59

CIF = cost, insurance, and freight, FOB = free on board, ha = hectare, kg = kilogram, MUV = manufacturers' unit value.

^a US No. 1 hard red winter, FOB United States, Gulf port. Source: Commodity Markets and the Developing Countries, the World Bank, April 1999.^b Urea (46% N), bagged, varying origins, FOB Eastern Europe. Source: Commodity Markets and the Developing Countries, the World Bank, April 1999.^c TSP (triple superphosphate 46%), bulk, FOB United States Gulf port. Source: Commodity Markets and the Developing Countries, the World Bank, April 1999.^d Potassium chloride FOB Vancouver. Source: Commodity Markets and the Developing Countries, the World Bank, April 1999.^e Using an MUV/multiplier to convert prices from 1990 to 1990 constant terms.^f American No. 1 grade, hard red winter wheat has an average price premium of 15% over Kazakhstan's wheat.^g Kazakhstan's wheat competes with American wheat in the Russian markets; export parity pricing of Kazakhstan's wheat forms the basis of the Kyrgyz Republic's border price of wheat.^h Includes trade commissions, export and customs administrative charges, and miscellaneous health, sanitary and clearance certificates.ⁱ Average distance to the project area is assumed at 300 km, at \$0.10/ton-km.^j At the official exchange rate of Som42.00 = \$1.00.^k Distance traveled of about 200 km.

Table A9.5: Incremental Income of Representative Farms ^a

Item	Large Farms				Medium-Size Farms				Small Farms			
	Without		With		Without		With		Without		With	
	ha	Som	ha	Som	ha	Som	ha	Som	ha	Som	ha	Som
Total area	850		850		65		65		7		7	
Revenue												
Crop Revenue												
Wheat	220	971,097	100	436,485	25	100,320	10	115,417	2	7,705	1	13,850
Barley	100	348,480										
Maize grain	50	563,558			5	33,137				9,045		
Sugar beet	50	676,459	80	871,279	2	24,599	10	199,785	1.5			
Onion											1.4	27,628
Potato			130	5,713,890			6	220,973			1.1	24,948
Sunflower			110	840,981			6	88,027				
Maize silage ^b	180		180		13		13		1.5		1.5	
Total Crop Revenue		2,559,594		7,862,635		158,056		624,202		16,750		66,426
Livestock Revenue												
Milk		715,000		715,000		51,840		65,340		5,702		5,994
Cattle		225,844		225,844		93,824		98,293		10,411		10,410
Total Livestock Revenue		940,844		940,844		145,664		163,633		16,113		16,404
Total Revenue		3,500,438		8,803,479		303,720		787,835		32,863		82,830
Production Costs												
Wheat		496,883		232,945		67,580		62,555		5,006		8,775
Barley		217,600										
Maize grain		135,826				14,091				3,863		
Sugarbeet		424,108		590,182		18,205		135,795				
Onion												16,706
Maize silage		206,475		206,475		17,883		21,639		3,657		4,540
Potato				2,915,803				143,722				14,575
Sunflower				563,750				59,834				
Water fee ^c		76,500		488,056		5,738		36,654		638		4,067
Livestock input costs:												
Labor		135,000		138,600		35,580		35,580		3,558		3,558
Feed concentrates and medicines		174,240		174,240		9,950		9,950		1,230		1,230
Heifer replacement cost		9,204		9,204		6,821		6,821		1,012		1,012
Total Production Costs		1,875,836		5,319,255		175,848		512,550		18,964		54,463
Other Operating Costs												
Salaries and wages		120,000		132,000								
Utilities		103,200		113,520		3,143		3,960		350		713
Management and administration		240,000		264,000		32,912		31,500		1,100		1,100
Building repair and maintenance		36,600		84,000		10,776		13,050		1,200		1,200
Social costs		226,800		226,800		16,972		17,010		1,890		1,890
O&M on on-farm facilities ^d		60,000		255,000		4,490		19,125		500		2,125
General transport		92,552		277,127		1,798		8,835		58		1,365
Other general expenses		59,400		65,340		4,000		4,000		2,200		2,200
Total Other Operating Costs		938,552		1,417,787		74,091		97,480		7,298		10,593
Total Costs		2,814,388		6,737,042		249,939		610,030		26,262		65,056
Gross Margin		686,050		2,066,437		53,781		177,805		6,601		17,774
Tax												
Land Tax ^e		226,800		226,800		16,972		17,010		1,890		1,890
Income Tax (10% of Gross Margin)		68,605		206,644		5,378		17,781		660		1,777
Net Income after Tax		390,645		1,632,993		31,431		143,015		4,051		14,107
Net income per irrigated ha		460		1,921		484		2,200		579		2,015
Net income per irrigated ha (\$/ha)		10.94		45.74		11.51		52.39		13.78		47.98
Incremental net income/farm				1,242,348				111,584				10,056
Incremental net income/ha				1,462				1,717				1,437
Incremental net income/ha (\$/ha) ^f				34.80				40.87				34.20

ha = hectare, O&M = operation and maintenance.

^a Farm budgets are at full development.^b Maize silage is assumed to be mainly utilized for livestock production by farms. Maize silage area is assumed to be nonirrigated and is about 30 percent of total farm area.^c Water fee assumed to increase to Som425/ha in year 6; cost recovery on irrigation rehabilitation investment assumed to start in year 6.^d O&M cost/ha of on-farm drainage and irrigation facilities under without- and with-Project situation estimated at Som100/ha and Som425/ha, respectively.^e Social cost - pension contributions are equal to the land tax.^f At Som42.00 = \$1.00.

Table A9.6: Financial Performance of Representative Farms ^a

Item	Large Farms		Medium-Size Farms		Small Farms	
	Without	With	Without	With	Without	With
Land area (ha)	600	600	45	45	5	5
Crop revenue (Som)	2,559,594	7,862,635	158,056	624,202	16,750	66,426
Livestock revenue (Som)	940,844	940,844	145,664	163,633	16,113	16,404
Gross revenue (Som)	3,500,438	8,803,479	303,720	787,835	32,863	82,830
Production costs (Som) ^b	1,875,836	5,319,255	175,848	512,550	18,964	54,463
Other operating costs (Som) ^c	938,552	1,417,787	74,091	97,480	7,298	10,593
Total costs (Som)	2,814,388	6,737,042	249,939	610,030	26,262	65,056
Gross margin (Som)	686,050	2,066,437	53,781	177,805	6,601	17,774
Gross margin (Som/ha)	1,143	3,444	1,195	3,951	1,320	3,555
Incremental gross margin (Som)		1,380,387		124,024		11,173
Incremental gross margin (Som/ha)		2,301		2,756		2,235
Incremental gross margin (\$/ha) ^d		54.78		65.62		53.20
Financial Internal Rate of Return		7.4		10.3		9.0

Note: Financial internal rate of return refers to the net return after payment of working capital, investment loans, water fees, O&M costs, and 25 percent share of the rehabilitation cost.

^a At full development.

^b Includes water tariff and payments on cost recovery of rehabilitation investments on drainage and irrigation facilities.

^c Includes other operating costs such as utilities, management and administration, maintenance, social costs, general transport, operation and maintenance of on-farm drainage and irrigation facilities, and other general expenses.

^d At Som42=\$1.00.

Table A9.8: Sensitivity Analysis for the Project

	Percent Change (%)	EIRR (%)	Switching Value ^a (%)
Base Case		15.1	
Individual Parameters			
1. Decrease in crop revenue	5	12.7	6.4
2. Decrease in livestock revenue	10	13.9	27.0
3. Decrease in crop and livestock revenue	5	12.2	5.2
4. Increase in production cost	10	12.9	13.9
5. Decrease in yields	5	10.4	8.3
6. Decrease in irrigated area	10	12.1	10.2
7. Costs up and revenues down	5	11.0	3.8
8. Delay in benefits by two years		12.5	

EIRR = economic internal rate of return.

^a Percentage change in parameter required to reduce the EIRR to 12 percent.Table A9.9: Effects on Government Budget
(Som million)

Item	Year					
	1	2	3	4	5	6
A. Before Financing						
Revenues						
Net revenue from water tariff collection						
Water tariff and rehabilitation cost recovery, with Project	7.013	7.013	9.350	14.025	18.700	27.506
Water tariff, without Project	7.013	7.013	7.013	7.013	7.013	7.013
Net revenue from water tariff collection	-	-	2.338	7.013	11.688	20.494
Investment goods tax (on civil works)	3.837	13.702	22.384	27.683	19.145	12.931
Fertilizer import tax:						
With Project	35.154	48.942	62.727	64.421	63.797	59.568
Without Project	12.173	12.678	12.678	12.678	12.678	12.678
Net fertilizer import tax	22.981	36.264	50.050	51.743	51.119	46.890
Chemicals import tax						
With Project	11.109	13.333	17.000	17.276	16.429	14.200
Without Project	2.960	2.547	2.547	2.547	2.547	2.547
Net chemicals import tax	8.150	10.786	14.453	14.730	13.882	11.653
Total Revenues	34.968	60.752	89.225	101.168	95.834	91.967
Expenditures						
Project Cost	177.235	254.071	298.657	356.796	380.786	383.806
Operation and Maintenance (O&M) Costs						
With Project O&M	5.500	5.610	10.986	17.298	21.739	23.375
Without Project O&M	5.500	5.500	5.500	5.500	5.500	5.500
Net O&M Costs	0.000	0.110	5.486	11.798	16.239	17.875
Net Expenditures	177.235	254.181	304.143	368.594	397.024	401.681
Net Government Budget Effect before Financing ^a	(142.267)	(193.429)	(214.918)	(267.425)	(301.191)	(309.713)
Accumulated Budget Effect	(142.267)	(335.696)	(550.614)	(818.040)	(1,119.231)	(1,428.944)
B. After Financing						
Net Government Budget Effect	(142.267)	(193.429)	(214.918)	(267.425)	(301.191)	(309.713)
Add: Loan	177.235	254.071	298.657	356.796	380.786	383.806
Less: Interest Payments ^b	1.772	4.313	7.300	10.868	14.675	18.514
Net Government Budget Effect after Financing ^a	33.195	56.329	76.439	78.503	64.919	55.579
Accumulated Budget Effect	33.195	89.524	165.963	244.466	309.386	364.965

^a Positive values indicate the amount provided by the Project to the Government treasury. Negative values indicate the shortfall that needs to be covered by the Government.^b Interest rate assumed at 1% annually on outstanding loan over eight years.

