ASIAN DEVELOPMENT BANK

RRP:UZB 31577

REPORT AND RECOMMENDATION

OF THE

PRESIDENT

TO THE

BOARD OF DIRECTORS

ON A

PROPOSED LOAN

AND

TECHNICAL ASSISTANCE GRANT

TO THE

REPUBLIC OF UZBEKISTAN

FOR THE

GRAIN PRODUCTIVITY IMPROVEMENT PROJECT

October 2003

CURRENCY EQUIVALENTS

(as of 7 October 2003)

Currency Unit		sum (SUM)
SUM1.00	=	$0.00103
$1.00	=	SUM975

ABBREVIATIONS

AADP	-	Ak Altin Agricultural Development Project
ADB	-	Asian Development Bank
ADPF	-	Association of Dehkan and Private Farmers
AGCLRI	-	Andijan and Galla Aral Cereals and Legumes Research Institute
AIME	-	Agricultural Institute for Mechanization and Electrification
ASC	-	agricultural service center
CAIIR	-	Central Asian Institute for Irrigation Research
COM	-	Cabinet of Ministers
COS	-	Country Operational Strategy
CSPU	-	Country Strategy and Program Update
DAWD	-	district agriculture and water resource department
DCF	-	discounted cash flow
EA	-	executing agency
EIRR	-	economic internal rate of return
FIRR	-	financial internal rate of return
FSU	-	former Soviet Union
GAP	-	gender action plan
ha	-	hectare
ICB	-	international competitive bidding
IDA	-	irrigation deficit area
IEE	-	initial environmental examination
IMF	-	International Monetary Fund
km	-	kilometer
MAWR	-	Ministry of Agriculture and Water Resources
M&E	-	monitoring and evaluation
MOE	-	Ministry of Economy
MOF	-	Ministry of Finance
MTP	-	machine and tractor park
NPV	-	net present value
O&M	-	operation and maintenance
PFI	-	participating financial institution
PGI	-	Plant Genetics Institute
PMO	-	project management office
PPI	-	Plant Protection Institute
PSC	-	project steering committee
PSO	-	project site office
PWG	-	project working group
RBAC	-	rural business advisory center
RESP	-	Rural Enterprise Support Project (World Bank)
RRA	-	Rural Restructuring Agency
SCLR	-	State Committee for Land Resources

SCNP	-	State Committee for Nature Protection
SCSQCC	-	State Center for Seed Quality Control and Certification
SCVT	-	State Commission on Varietal Testing
SPCA	-	Scientific Production Center for Agriculture
TA	-	technical assistance
WUA	-	water users association

GLOSSARY

Dehkan farms	-	Farm plots of 0.20–0.35 ha given by the state to urban or rural households to augment household backyard plots. Employees of larger cooperative (shirkat) farms can also be dehkan farmers.
Elite seeds	-	Progenies of super elite seeds. Elite seeds are produced by seed farms.
F1, F2, F3 seeds	-	Certified seeds. F1 seeds are progenies of elite generation seeds. F2 and F3 denote succeeding generations after F1. Little genetic deterioration occurs between generations of wheat provided that adequate quality control standards are maintained in seed multiplication.
Grain shattering	-	Breakage (shattering) of wheat head because of high temperature and lack of moisture commonly caused by late harvest in the summer. Once grains fall to the ground, they cannot be machine harvested, causing substantial harvest loss.
Irrigation-deficit area (reduced irrigation area)	-	Irrigated or irrigable areas that cannot be irrigated in June-August due to inadequate water at the source and inefficient water conveyance. This area cannot be used for cotton cultivation.
Oblast	-	Province; also known as *wiloyat* in Uzbek
Shirkat farm	-	A large cooperative farm (1,500–2,500 ha), converted from a collective or state farm.
State procurement quota	-	Obligatory harvest volume that must be sold to the state at prices determined by the state. Farmers are obliged to fulfill their quotas first before selling crops at local markets at negotiated prices.
Super elite seeds	-	Also known as foundation seeds, produced by research institutions and accredited (foreign joint ventures) seed companies. Seed imports generally comprise foundation and parent (breeder) lines.

NOTES

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

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LOAN AND PROJECT SUMMARY

Borrower	Republic of Uzbekistan
Classification	Poverty: Pro-poor growth Thematic: Private sector development
Environment Assessment	Category B. An initial environmental examination (IEE) has been undertaken and the summary IEE is a supplementary appendix.
Project Description	The project activities will cover four components. The first is capacity building of a wheat-breeding institute and crop variety testing agency. The component will aim at accelerating the release of new wheat varieties that are better suited for cultivation in Uzbekistan. The second will build the capacity of rural business advisory centers (RBACs) and selected research institutes to promote adoption of new wheat varieties and improve farming practices, particularly in crop rotation and on-farm soil and water management. The third will provide credit funds and capacity-building assistance for private enterprises that will produce wheat seeds and provide farm support services (farm input retailing, machinery rental, and agroprocessing services). The fourth will support coordination of project activities and impact monitoring. The first and second components will cover five wheat-producing provinces of Tashkent, Syrdarya, Djizak, Samarkand, and Kaskadarya in central Uzbekistan. Limited irrigation facility repairs under the second component and enterprise development under the third component will be carried out in three focus districts of Kuyi-Chirchik, Zamin, and Katakurgan in Tashkent, Djizak, and Samarkand provinces, respectively. The Project will also facilitate policy dialogue and monitoring to deepen reforms in the agriculture sector, including reduction of the mandatory volumes of wheat and wheat seeds that farms are required to sell to the state in the focus districts. Complementing the reduction of the public sector's purchases of wheat and wheat seeds, the Project will facilitate private sector participation in seed production, provision of farm inputs, and product processing and marketing. Reforms introduced in the three districts will be expanded nationwide in a phased manner.
Rationale	To secure wheat supply, Uzbekistan—a remote landlocked country with limited physical access to international markets—raised wheat output from 0.6 million to 4.7 million tons in 1993–2002. With a domestic requirement of about 4.5 million tons, the country is self-sufficient in wheat. Despite the gains in output, the wheat subsector and the agriculture sector, in general, are facing key challenges. First, aggregate wheat output is prone to sudden drops because the wheat varieties cultivated in Uzbekistan are

susceptible to local pests/diseases and not adapted to the local climate. Second, the increase in wheat production has relied excessively on wheat planting in fertile and well-irrigated lands, restricting the available land for cultivation of higher-value crops. Rigid state control over cropping patterns and marketing has also constrained farm income growth.

To address these challenges, and increase farm income and ensure food security, Uzbekistan needs to rationalize its wheat production, particularly to minimize wheat cultivation where higher-value crops can be grown. Investments should also be made to stabilize and improve wheat yields, especially in the less irrigable and rain-fed areas. Three critical interventions are needed: (i) accelerate the introduction of wheat varieties adaptable to local conditions, (ii) support agricultural extension to introduce sustainable and more profitable farm practices and technologies for wheat cultivation, and (iii) improve farm access to agricultural support services, including the supply of agrochemicals, farm machinery, and agroprocessing services.

Objective

The project objective is to promote economical and sustainable systems of wheat production. Achievement of the project objective will contribute to the realization of the project goal to improve farm income.

Cost Estimates

The total project cost is estimated at $40.0 million equivalent, composed of $23.4 million in foreign exchange and $16.6 million equivalent in local currency. The cost estimates include taxes and duties amounting to $2.3 million.

Financing Plan

$ million equivalent

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Asian Development Bank	23.4	2.6	26.0	65
Government	0.0	10.6	10.6	26
Beneficiaries	0.0	3.4	3.4	9
Total	**23.4**	**16.6**	**40.0**	**100**

Loan Amount and Terms

A loan of $26.0 million from Asian Development Bank (ADB) ordinary capital resources will be provided under ADB's London interbank offered rate (LIBOR)-based lending facility. The loan will have a term of 25 years, including a grace period of 5 years; an interest rate determined in accordance with ADB's LIBOR-based lending facility; a commitment fee of 0.75% per annum; a front-end fee of 0.50% of the loan amount; conversion options that may be exercised in accordance with the terms of the Loan Agreement, ADB's *Loan Regulations*, and *Conversion Guidelines*; and other terms and conditions set forth in the draft Loan Agreement.

Allocation and Relending Terms	For the Project's agricultural enterprise development component, the Ministry of Finance (MOF), on behalf of the Borrower, will on-lend $10.1 million of the loan proceeds to private companies providing diversified services to farms and producing wheat seed in the three project districts. The subsidiary loans will be channeled through a maximum of two participating finance institutions (PFIs) to be identified during the first year of project implementation, based on criteria agreed on between ADB and the Borrower. Subsidiary loans from MOF to PFIs will be for 10 years, including a 4-year grace period. Subloans from PFIs to the enterprises will be for 10 years, including a 3-year grace period. Real market interest will be applied to the subloans, taking into account the cost of administering the subloans, credit risk, and reasonable amount of profit for PFIs. Commitment fees of ADB to MOF will be passed on to PFIs, which will bear the subloan credit risks. Foreign exchange risk will be passed on to the enterprises.
Period of Utilization	31 March 2009
Estimated Project Completion Date	31 December 2008
Implementation Arrangements	A project steering committee, headed by a deputy prime minister and comprising senior government staff, will be established to guide project implementation and monitor project development impacts. The Rural Restructuring Agency (RRA), under the Ministry of Agriculture and Water Resources, will execute the Project. A project management office (PMO) has been established within RRA to manage the day-to-day project implementation, with project site offices (PSOs) to be established in the three project districts to supervise field activities. PMO, PSOs, and district governments will work with the beneficiaries, wheat-breeding and agricultural research institutes, RBACs, and private enterprises.
Executing Agency	Rural Restructuring Agency
Procurement	The Project will procure farm machinery, research and office equipment, vehicles, materials, and civil works services. All procurement will be undertaken in accordance with ADB's *Guidelines for Procurement under Asian Development Bank Loans*. Procurement of goods and services under the subloans made out of loan proceeds will be carried out by private enterprises. The subborrowers need to demonstrate that their procurement procedures are transparent, efficient, and conform with ADB's *Anticorruption Policy*.
Consulting Services	The Project will provide 31 person-months of international and 42 person-months of domestic consultant services. The international consultants will help (i) administer the Project, (ii) evaluate project impacts, (iii) upgrade wheat plant breeding and variety testing, (iv) develop effective extension services, and (v) evaluate the

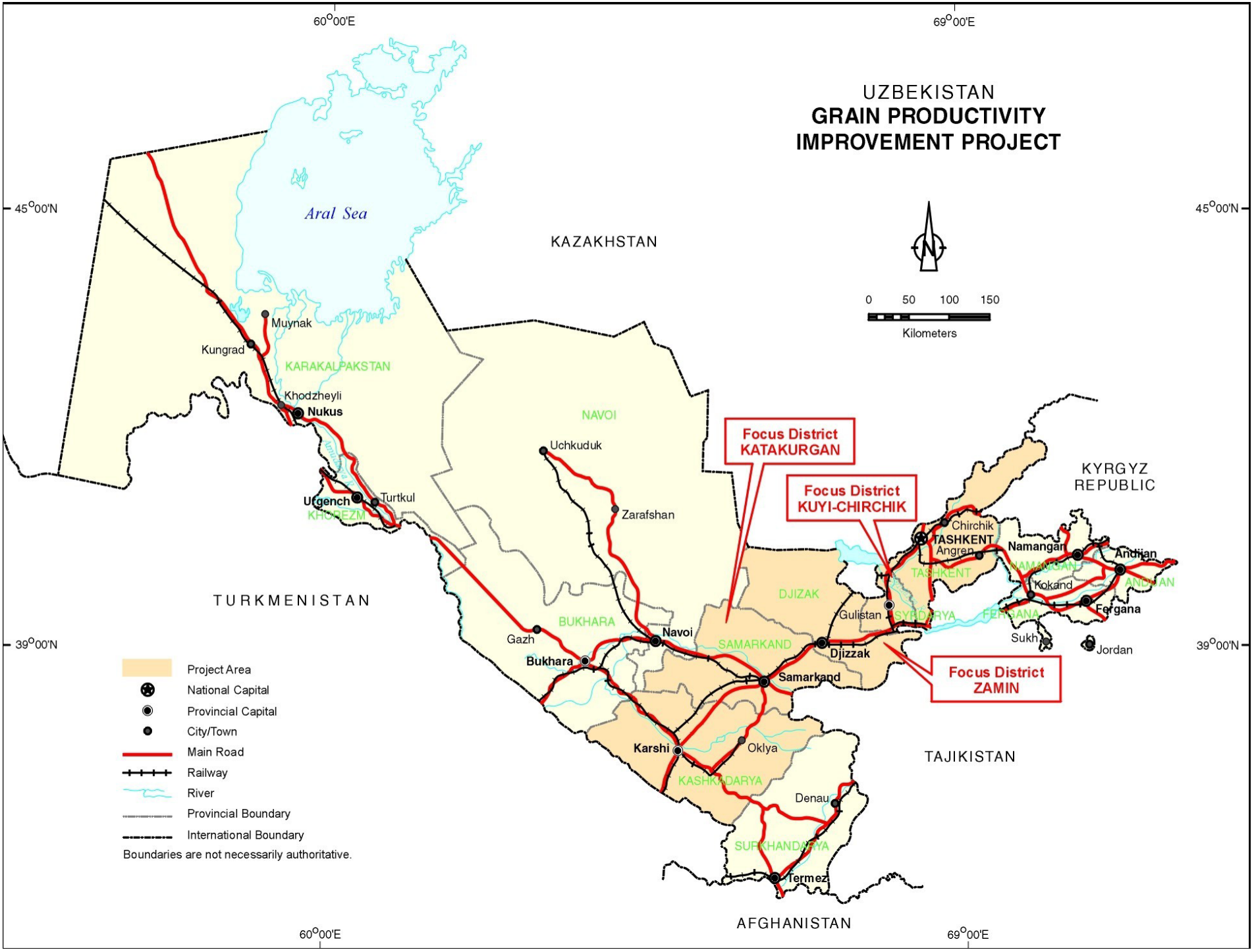
suitability of candidate financial institutions to take part in the Project. Domestic consultants will help organize water users associations to strengthen irrigation operation and maintenance in the project areas. Domestic consultants will also support capacity building in extension service, project impact evaluation, and evaluation of finance institutions. The engagement of consultants will conform to *Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers* and other arrangements acceptable to ADB for the engagement of domestic consultants.

Project Benefits and Beneficiaries

The Project is expected to benefit 217,000 families in the project area, most of whom work on the private and cooperative farms and cultivate wheat on household plots. The Project is expected to increase average wheat yields of irrigated farming systems from 2.4 to 2.7 tons (t) per hectare (ha), and rain-fed wheat yield from 0.6 to 1.0 t/ha in 7 years. In the three pilot districts, farm income is expected to increase by 31-60% by 2008. Introduction of drought-tolerant and early maturing wheat varieties, combined with enhanced soil fertility management in the dry areas, will increase yields, which, in turn, will increase demand for labor, particularly of women and young adults. Enhanced farm income will improve communities' access to social and health services and improve living conditions. In the project districts, crop price reforms, strengthened rural business advisory services, and private sector entry into agricultural support services will yield robust and sustainable growth in farm profits. The Project's economic internal rate of return is estimated at 31%.

Technical Assistance

An advisory technical assistance (TA) grant will (i) support private sector entry and operations in seed production and provision of agricultural support services in the three project districts, and (ii) assist the Government in reviewing its food security strategy. The TA will help demonstrate the benefits of competitive private business operations in agriculture. The TA is estimated to cost $600,000 equivalent, of which $400,000 equivalent will be financed by ADB on a grant basis from the Japan Special Fund. The TA will provide services of 12 person-months of international and 15 person-months of domestic consultant inputs.


UZBEKISTAN
GRAIN PRODUCTIVITY IMPROVEMENT PROJECT
60°00'E
69°00'E
45°00'N
39°00'N
Aral Sea
KAZAKHSTAN
KYRGYZ REPUBLIC
TURKMENISTAN
TAJIKISTAN
AFGHANISTAN
0 50 100 150
Kilometers
Muynak
Kungrad
KARAKALPAKSTAN
Khodzheyli
Nukus
Urgench
Turtkul
KHOREZM
NAVOI
Uchkuduk
Zarafshan
Focus District KATAKURGAN
Focus District KUYI-CHIRCHIK
Focus District ZAMIN
Chirchik
TASHKENT
Angren
Namangan
Andijan
NAMANGAN
ANDIJAN
Kokand
Fergana
FERGANA
Sukh
Jordan
DJIZAK
Gulistan
SYRDARYA
BUKHARA
Gazh
Navoi
Bukhara
SAMARKAND
Djizzak
Samarkand
Karshi
Oklya
KASHKADARYA
Denau
SURKHANDARYA
Termez
Project Area
National Capital
Provincial Capital
City/Town
Main Road
Railway
River
Provincial Boundary
International Boundary
Boundaries are not necessarily authoritative.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republic of Uzbekistan for the Grain Productivity Improvement Project. The report also describes proposed technical assistance (TA) for furthering reform in the grain sector, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, will approve the TA.[1]

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS, AND OPPORTUNITIES

A. Sector Performance, Indicators, and Analysis

2. Crops comprise 60% of the value of agricultural output of Uzbekistan, with cotton and wheat as two major crop commodities. Cultivable land represents about 10% of the total land area, or 4.4 million hectares (ha), of which 3.7 million ha are irrigated, and the remaining, rain-fed. Some 16 million ha are grassland, which supports livestock production. Much agricultural production is concentrated in the irrigated areas of the central and eastern parts of the country. Cultivable rain-fed areas are mostly used for grain production. About 56% of the country's 25.6 million people live in rural areas. Agriculture accounts for about 28% of the gross domestic product (GDP), 44% of employment, and 60% of export revenues.

3. Under the former Soviet Union (FSU), Uzbekistan was a designated producer of cotton, with 70–80% of the total irrigated land devoted to the crop. Fodder crops (alfalfa, rye, barley, and maize), which were grown in rotation with cotton, supported limited livestock production. Production of staple crops, such as wheat and potatoes, was discouraged. Areas planted to fruits and vegetables were constantly reduced. Before 1991, Uzbekistan produced less than 20% of the wheat it consumed, and the rural areas suffered food shortages. Wheat on average accounts for 85% of household consumption of staple foods in Uzbekistan,[2] which comprise mostly of wheat, rice, and potatoes.

4. After independence in 1991, Uzbekistan's access to wheat became less secure because of the cessation of the centrally administered barter system under the FSU and a growing instability of the region's economies. As a landlocked country with limited physical access to international markets, food security became a major concern, and Uzbekistan embarked on a wheat self-sufficiency program. From 1993 to 2002, aggregate wheat output grew from 0.6 million to 4.7 million tons. With domestic consumption estimated at 4.5 million tons, the country is becoming self-sufficient in wheat.[3] An analysis of the agriculture sector is in Appendix 2.

B. Analysis of Key Problems and Opportunities

1. Sector Challenges

5. Despite impressive gains in grain output, the agriculture sector faces key challenges. First, wheat production is still prone to sudden drops because the recent output growth has relied on imported high-yielding wheat varieties (mostly from Russia) that adapt poorly to local conditions. As a result, standing crops are prone to high summer temperature, unstable water

[1] The project design is summarized in a Project Framework presented in Appendix 1.

[2] Ministry of Macroeconomic and Statistics, 1994–2000. Per capita consumption of other cereals such as corn, barley, and oats is negligible. Potatoes are the second largest source of carbohydrate after wheat.

[3] Uzbekistan imports about 100,000 tons of hard durum wheat per annum, which cannot be produced domestically in adequate quantity.

supply, drought, diseases, and pests (e.g., locusts). Second, production costs are still relatively high due to inefficient farm input use, excessive land preparation, and untimely application of fertilizers. Third, wheat seed production has been overly concentrated in the eastern part of the country (Andijan province), resulting in expensive seed transport, mixing of varieties, and poor seed adaptability to other agroclimatic zones. Poor seed germination leads to costly re-sowing that increases farm costs by an average of 16%. Fourth, intensive cultivation of wheat in rain-fed areas and wheat and cotton crop rotation in irrigated areas are harming soil fertility and structure. Fifth, the agriculture sector suffers from chronic shortages of fertilizers and machinery services due to low farm profits and inefficient delivery of farm inputs. State-owned enterprises still play a dominant role in the supply of agrochemicals, seeds, machinery services, and preproduction financing. In an environment of predetermined market shares and prices, the enterprises have limited incentives to upgrade or expand services. The use of poorly adapted wheat varieties and imbalanced application of fertilizers have lowered the quality of domestically produced wheat flour, yielding bread with low protein content.

6. National wheat output has also increased largely due to the state order system, which has regulated cropping patterns (land allocation for various crops) and the volumes of wheat and cotton farmers must sell to the state, known as the state procurement quotas.[4] Although the system has helped stabilize crop outputs, it has limited farmers' options to adjust crop production in response to market conditions and to improve income. The national program for wheat self-sufficiency requires the allocation of an estimated 0.8 million ha (25%) of well-irrigated land for intensive wheat production, thus, foregoing the land's full economic potential for growing higher-value crops such as cotton, vegetables, fruits, and seeds (including wheat seeds). A comparative crop return analysis is provided in para. 52. Overall, impediments to improving farm incomes have hampered farmers' ability to reinvest their earnings to increase farm productivity.

2. Sector Policies and Programs

7. The agricultural development strategy of Uzbekistan is guided by the Program for Strengthening Reforms in Agriculture of March 1998. Reflecting major sector concerns, the program pursued three goals: (i) generate robust foreign exchange earnings, mainly through the sale of cotton; (ii) improve food security; and (iii) promote rural employment, enhance living standards, and ensure social stability.

8. To stimulate improvement in farm income and productivity, the Government has introduced phased reforms in crop production and marketing. In connection with implementation of the Ak Altin Agricultural Development Project (AADP),[5] beginning in 2002 the Government abolished the production targets for wheat and cotton in the pilot district of Ak Altin and lowered their procurement quotas by more than 50% (Appendix 2). As of 2003, similar reforms are being adopted in 5 other pilot districts covered under the World Bank's Rural Enterprise Support Project (RESP).[6] Nationally, the Government has also abolished the system of joint responsibility among farms or family groups to fulfill the procurement quotas.[7] Since 1999, the

[4] Regulation of cropping pattern was abolished in March 2003 (para. 9). The obligatory state procurement quotas, however, remain, although they are being lowered in selected areas.

[5] ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance Grant to the Republic of Uzbekistan for the Ak Altin Agricultural Development Project*. Manila. Ak Altin is in the Syrdarya province (oblast).

[6] RESP was approved on 28 November 2001, for $36.14 million.

[7] Joint responsibility refers to the system where the failure of a production unit (private farmer or family group) to meet its procurement quota results in an increase in quotas of other units.

state has progressively dissolved less productive large cooperative farms or *shirkats* (Glossary) into private farms, which has increased farm incomes.[8] In line with agreements with the Asian Development Bank (ADB), World Bank and the International Monetary Fund (IMF),[9] starting from 2002 the procurement prices for cotton and wheat nationwide are aligned with international market prices, instead of the state-estimated production costs, as practiced in the past. The price adjustment led to a 72% and 57% rise in wheat and cotton procurement prices, respectively, in 2002–2003.[10]

9. In line with IMF conditions and the intention to ease the state monopoly in cotton marketing, the Government adopted a resolution in December 2002 to allow private sector participation in cotton wholesale and export. Issuance of the resolution was followed by the release of the Presidential Decree on Deepening Reforms in the Agricultural Sector in March 2003. The decree directed the Government to accelerate the formation of private farms and extend the reforms advocated by ADB and World Bank to abolish cropping pattern restrictions nationwide. To improve farm receipts, a price premium has been introduced for state procurement of cotton and cotton byproducts.

10. As a part of its food security strategy, Uzbekistan aims to stabilize wheat production and prices. With outputs exceeding domestic consumption in 2002, the Government has implemented a buffer stock management system to stabilize wheat price. The State also intends to lessen the aggregate state procurement of wheat in the coming years below the present level of 2.7 million tons. The abolition of prescribed cropping patterns nationwide (para. 9) is intended to allow wheat production to adjust more readily to market demand.

11. ADB's operations in Uzbekistan is guided by the Country Operational Strategy (COS) for Uzbekistan of March 2000 and the Country Strategy and Program Update (CSPU) for 2003–2005, which both support the Government's efforts to transform the country's centrally planned system into a market economy to promote economic efficiency, generate sustainable employment, and reduce poverty. The COS emphasizes assistance to agriculture, infrastructure rehabilitation, and education. The CSPU particularly emphasizes assistance to agricultural and rural development as most of the poor reside in rural areas.

3. Project Rationale

12. To address the sector challenges and meet the sector goals (paras. 5–7), Uzbekistan should rationalize its wheat production, particularly by minimizing wheat cultivation where higher-value crops can be grown. Investments should be made to stabilize and increase wheat yields, especially in the less irrigable and rain-fed lands. Farm access to agrochemicals and machinery must likewise be improved to raise the quality of domestically produced wheat. A relatively low-cost project should be carried out to (i) accelerate the introduction of wheat varieties adaptable to local conditions; (ii) support agricultural extension to promote sustainable and more profitable agricultural practices and cropping rotations involving wheat; and (iii) improve farm access to support services, including the supply of agrochemicals, farm machinery, transport, and agroprocessing services, by promoting private sector participation in these activities. To encourage investment in the farms and rural enterprises, the Project should

[8] Based on government and World Bank surveys.
[9] Agreements with the IMF were in connection with the Staff Monitored Program implemented in January–August 2002.
[10] The assessment of reform progress is based on findings of the sector review missions fielded in October 2002 and April 2003.

help deepen agriculture sector reforms and demonstrate, in selected areas, economically viable and sustainable systems of wheat production.

4. Project Area

13. The Project will provide assistance to 5 wheat-producing provinces (*oblasts*), covering wheat breeding, testing of new wheat varieties, dissemination of improved farming technologies, and strengthening of the state's pest-monitoring program. These oblasts were chosen based on availability of land suitable for wheat cultivation (i.e., rain-fed areas with precipitation in excess of 300 millimeters per annum and irrigable land not suitable for high-value crops). The project area stretches from north to south in the central part of the country, covering the oblasts of Tashkent, Syrdarya, Djizak, Samarkand, and Kashkadarya. The area has 560,000 ha and 293,000 ha of irrigated and rain-fed wheat area, respectively, or 54% and 95% of the national totals. Average yield of irrigated wheat in the oblasts is 2.4 tons (t)/ha, which is still lower than the national average of 3.8 t/ha. Average rain-fed yields, which range from 0.6 to 1.0 t/ha can realistically be doubled over the coming decade by introducing drought-resistant and earlier-maturing varieties.

14. The project oblasts account for 26% of the total agricultural land and 44% of irrigated land. They produced 1.5 million tons of wheat (37% of the national total) and 1.0 million tons of raw cotton (33% of the total) in 2000. The project area population was 8.9 million (36% of the total) as of 2001, 6.2 million or 69% of whom live in rural areas, which is higher than the national figure of 63%. Of the total cultivated area of 1.9 million ha, 72% were under farm enterprises (state or shirkat farms), 18% under private farms, and 10% under *dehkan* farms (Glossary). In 2001 almost all farm enterprises and private farms planted wheat, occupying 42% and 40% of their total sown areas, respectively. At least 70% of rural families in Kaskadarya, Samarkand, and Djizak, and 40% in Tashkent and Syrdarya planted wheat in their backyard plots (average 0.15 ha per household).

15. Intensive and integrated assistance will be provided in three focus districts within the project oblasts. These will cover assistance provided to the oblasts as well as additional support for operations of private seed companies, enterprises providing farm support services, and farmer-owned advisory extension centers. The districts are selected based on their (i) climate and soil suitability to support rain-fed wheat (commercial grain and seed production), (ii) soil suitability for irrigated wheat production, (iii) reliability of the irrigation system and availability of well-irrigated and drained land for wheat seed production, and (iv) distance and access to market as a proxy for attractiveness of the district to private sector investment. Criteria and mechanisms used to select focus districts, and the description of the project area are in Supplementary Appendix B. The three districts are: Zamin (286,000 ha) in Djizak oblast, Katakurgan (146,778 ha) in Samarkand oblast, and Kuyi Chirchik (56,000 ha) in Tashkent oblast. Zamin and Katakurgan have been selected as model sites for rain-fed and irrigated wheat seed and commercial grain farming. Kuyi-Chirchick was chosen as a potential regional center of seed production for Tashkent and Syrdarya oblasts.

III. THE PROPOSED PROJECT

A. Objective

16. The project objective is to promote economical and sustainable systems of wheat production. Achievement of the project objective will contribute to the realization of the project goal to improve farm income.

B. Components and Outputs

17. The Project has the following components: (i) varietal development and testing, (ii) enhanced farm management, (iii) agricultural enterprise development, and (iv) project management. They are described below.

1. Varietal Development and Testing

a. Varietal Development

18. The component will strengthen the capacity of the Andijan and Galla-Aral Cereals and Legumes Research Institute (AGCLRI) of the Ministry of Agriculture and Water Resources (MAWR) to efficiently evaluate and identify, among hundreds of local and foreign wheat varieties and parent materials, varieties suitable for the local growing conditions. Project interventions will complement assistance already received by the institute in forms of breeding materials and training, with the provision of laboratory and field equipment; refurbishment of laboratories, greenhouses, and storage facilities; establishment of research plots; supply of work materials; and domestic/overseas staff training. The assistance to AGCLRI will be accompanied by capacity building of the Plant Genetics Institute (PGI) of the MAWR to upgrade its capability to evaluate cereal resistance to diseases. Aside from support for wheat varietal development, the Project will also assist the legume variety development by AGCLRI to help promote wheat and legume crop rotation, particularly in the rain-fed areas.

19. The outputs expected from the subcomponent are the release of at least 6 new wheat varieties that are well-suited to local conditions, and the doubling of the AGCLRI capacity to multiply foundation seeds from 400 tons to 900 tons per annum. Desirable characteristics of new wheat varieties include improved baking quality, early maturity and improved tolerance to drought for rain-fed varieties, resistance to local pests and diseases,[11] reduced grain loss through shattering at maturity, and variable grain maturity period for irrigated wheat to lengthen the harvest season and reduce the number of expensive combine harvesters required by farmers. The Project will also support commercial production of improved seeds through the establishment and capacity building of private seed companies in the project districts (para. 25).

b. Varietal Testing

20. Capacity building assistance will be provided under the Project to the State Commission on Varietal Testing (SCVT), a regulatory agency of MAWR, to strengthen and expedite the agency's evaluation of promising varieties identified by AGCLRI and varieties to be imported into Uzbekistan by private seed companies. Aside from building the capacity of 5 SCVT test stations in the 5 project oblasts, the Project will expand the geographical coverage of varietal testing to include 15 on-farm sites to ensure robust evaluation of varieties under different agro-ecological conditions. Under the component, consultant inputs will be provided to (i) upgrade SCVT's testing procedures, (ii) upgrade quality control in the seed multiplication, (iii) develop a plan for AGCLRI and SCVT to better recover the costs of varietal development, and (iv) promote farmers' participation in the wheat breeding program.

[11] Breeding for resistance to fungal leaf diseases such as rust is a continuing process as rust organisms naturally mutate.

2. Enhanced Farm Management

a. Farm Extension

21. In the three focus districts, the Project will support operations of three rural business advisory centers (RBACs) established under the Association of Dehkan and Private Farmers (ADPF), which is a national farmers association. The RBACs will function as rural consulting firms, particularly to provide private and household farms with technical farming, legal, and financial advisory services. Their services will include the preparation of market demand analysis and feasibility studies for farms and enterprises. Based on feedback from farmers'-need surveys, RBACs will introduce new crop varieties and organize demonstrations of alternative crop rotation regimes and farm management practices. With funds appropriated to them, RBACs will contract appropriate institutes and experts to facilitate on-farm demonstration and disseminate technologies that interest farmers. Experienced farmers from other regions will also be invited to exchange views and experiences with farmers in the project districts. The subcomponent will therefore promote consultative and demand-oriented rural extension service.

b. Technology Development

22. To introduce new and appropriate technologies, selected institutes of MAWR will organize field demonstrations and prepare manuals for farmers. Priority will be given to technologies that have been pilot-tested in Uzbekistan and proven promising technically and financially—particularly those tested under ADB-funded regional technical assistance for On-farm Soil and Water Management in Central Asia.[12] For water-short and rain-fed areas, the Project will promote adoption of low-tillage techniques to conserve soil moisture, lessen machinery costs, and allow early planting and maturity of wheat. Early maturity in these areas will reduce yield losses due to exposure of crops to the high summer temperature. Other techniques for water-short areas are alternate year planting and wheat-legume rotation to improve soil fertility and moisture retention. In irrigated lands, the subcomponent will promote cut-back and alternate furrow irrigation methods as well as furrow-bed planting techniques to reduce excessive water application and mitigate the adverse effect of soil salinity. Improved soil and water management techniques will be introduced by the Central Asian Institute for Irrigation Research (CAIIR) in association with other institutes selected by the project working group. For fields that produce wheat seeds, laser field leveling will be tested to ensure a high rate of germination of expensive foundation and elite seeds, and uniform water application to allow substantial increase in yields. Laser land leveling technology will be introduced by the Agricultural Institute for Mechanization and Electrification (AIME).

23. The capacity of the Plant Protection Institute (PPI) will be improved under the subcomponent to monitor and forecast disease, pest and weed infestations, particularly locust infestation, which has harmed wheat crops. The Project will provide equipment and support field monitoring works to help MAWR recommend in a timely manner measures needed to prevent costly pest and disease outbreaks. Support for PPI and MAWR will include financing information dissemination to farmers on the risks of pest infestation and implementation of critically needed pest control interventions to prevent pest outbreaks.

[12] ADB. 1999. *Regional Technical Assistance for the Fourth Agriculture and Natural Resource Research at CGIAR Centers.* Manila. Pertinent activities are carried out under the component for On-Farm Soil and Water Management for Sustainable Agriculture in Central Asia, for $1.2 million.

c. Irrigation Facility Repair

24. The Project will help improve irrigation and drainage facilities on about 6,000 ha of wheat seed-producing farms to help ensure robust seed production in the focus districts. Complementing the on-farm rehabilitation works, minor repairs will be performed on the existing inter-farm water conveyance and collector drainage facilities. Field surveys and civil works for the subcomponent will be funded with government counterpart resources. The rehabilitation plan, and costs for each farm will be agreed between farmers and the district agriculture and water resources department (DAWD) of MAWR and the project management office (PMO). The cost of facility repairs will be recovered in 25 years (para. 56).[13] To sustain the operation of the rehabilitated irrigation facilities, the Project will support the formation and operations of water users associations (WUAs). The Project will also provide critically needed equipment to maintain primary canals and drainage collectors in the project districts to be undertaken by DAWDs.

3. Agricultural Enterprise Development

25. The shortage of machinery and agrochemicals are key causes for unstable crop yields and deteriorating quality of domestically produced wheat. In the project districts, the component will help form and operate privately owned agricultural service centers (ASCs), which will provide farmers with diversified services such as machinery rental, input retailing, agroprocessing, marketing, and transportation. The Project will also help create and assist the operation of private companies that will produce high-quality wheat seeds in the three districts. The seed companies will work together with private farms, on a contractual basis, to cultivate and multiply seeds from foundation seeds.

26. The project loan funds of $10.1 million will be provided to enterprises under the Project through selected participating financial institutions (PFIs). The enterprises will use the project subloans to procure needed equipment and other capital investment requirements. Details of the eligibility criteria of PFIs and subborrowers and the on-lending arrangements are in Appendix 3. The Project will screen suitable private sector sponsors, including groups of private farmers, local businesses, and foreign joint ventures, and assist the operations of the ASCs and seed companies. The technical assistance for furthering reforms in the grain sector (paras. 49–50) will also assist prospective sponsors to refine their business plans and provide technical and legal assistance necessary for their business operations. To promote the development of ASCs and seed companies and ensure the affordability of goods and services they provide, key reform initiatives will be introduced in the project districts, primarily to ease the state control of prices and obligatory procurement quotas for wheat and wheat seeds and to promote competition among the enterprises (paras. 29, 69, and 70).

27. Suitable PFIs, such as Pahta and Asaka Banks, were identified during project preparation in 2003. However, given the potential consolidation and privatization of the banks in anticipation of the full convertibility of the Sum, selection of PFIs to take part in the Project will be carried out in 2004. This approach will prevent the need to repeat the PFI selection and will not hinder project implementation. International and local banking experts (3 person-months) will be engaged to facilitate the selection process.

[13] Repayment scheme for the on-farm works will follow a similar scheme being introduced under AADP.

4. Project Management

28. The Project will help operate the PMO and three project site offices (PSOs) in the project districts. The PMO will be provided with qualified staff, equipment, vehicles, and facilities necessary to coordinate and supervise project activities, and will be headed by a project manager, who will report to a director general of the Rural Restructuring Agency (RRA), the project executing agency. The director general will be the project director. PMO and PSO activities will focus on administrative and financial management tasks. Technical tasks will be carried out by the line departments and institutes under MAWR with administrative and resource allocation support from the PMO to strengthen the capacity of MAWR to perform its duties. PMO and PSO operations will be supported by project management consultants, who will provide on-the-job training in project administration, monitoring, and evaluation. PMO and PSO staff will also receive training in activity planning, budgeting, procurement procedures, and preparation of project reports.

C. Special Features

1. Support for Agricultural Sector Reforms

29. The Project will help introduce market-oriented reforms in the agriculture sector. In the three project districts, state procurement quotas for wheat—a parameter that reflects the state's direct involvement in farm production and marketing decisions—will be reduced from over 50% to 25% of historical output, in line with reforms introduced under AADP and RESP. The Government has further agreed to lower the procurement quotas for wheat seeds in the project districts as outlined in para. 69. Given the state's dominant role in wheat seed production and farm input retailing, the reforms will be introduced to reduce the state's direct involvement and promote private sector participation in these business activities. The Project will facilitate the establishment and operation of fully private ASCs and seed companies. This initiative will be a step forward in the sector's transition process following the creation of a commercially-run state-owned farm equipment rental firm under AADP, and joint venture ASCs between the state and private sector under RESP.[14]

2. Demand-Oriented Agricultural Extension

30. The concentration of project resources on RBACs, instead of a higher-level apparatus, is intended to decentralize agricultural extension program of MAWR so that RBACs will be more responsive to the needs of farmers and local communities. The project design to gradually change the RBACs' source of funding from state and project budgets to the collection of service fees will also give appropriate incentives for RBACs to better understand their clients' needs and meet them in a cost effective manner. The initiative, therefore, will help institutionalize farmers' feedback mechanisms and participation on extension services provided under the Project. At national level, the Project will also help simplify information pamphlets and manuals to enhance the dissemination of technical, legal, and market information in rural areas. Improved information materials will be distributed by RBACs and DAWDs on a cost recovery basis.

[14] Under RESP, the state may hold up to 40% equity stake in ASCs.

D. Cost Estimates

31. The total project cost is estimated at $40.0 million equivalent, comprising $23.4 million in foreign exchange costs and $16.6 million equivalent in local currency costs. The estimates include provision for $2.3 million in taxes and duties, and $3.8 million in the physical and price contingencies. A summary of the cost estimates is in Table 1 while the detailed costs are in Appendix 4.

Table 1: Cost Estimates
($ million)

Component	Foreign Exchange	Local Currency	Total Cost
A. Base Costs			
1. Varietal Development and Testing	2.3	1.5	3.8
2. Enhanced Farm Management	4.2	8.9	13.1
3. Agricultural Enterprise Development	10.1	2.8	12.9
4. Project Management	0.6	1.0	1.6
Subtotal (A)	**17.2**	**14.2**	**31.4**
B. Contingencies			
1. Physical	1.1	1.5	2.6
2. Price[a]	0.3	0.9	1.2
Subtotal (B)	**1.4**	**2.4**	**3.8**
C. Interest During Construction	**4.4**	**0.0**	**4.4**
D. Commitment Fee	**0.3**	**0.0**	**0.3**
E. Front-End Fee	**0.1**	**0.0**	**0.1**
Total	**23.4**	**16.6**	**40.0**
Percent	59.0	41.0	100.0

[a] Based on the projections of the indices for inflation in dollar terms.
Source: Asian Development Bank estimates.

E. Financing Plan

32. The Government of Uzbekistan has requested a loan of $26.0 million from ADB's ordinary capital resources to help finance the Project. The loan will have a 25-year term, including a grace period of 5 years, an interest rate determined in accordance with ADB's LIBOR-based lending facility, a commitment charge of 0.75% per annum, a front-end fee of 0.50% of the loan amount (the fee will be capitalized in the loan), and such other terms and conditions set forth in the draft Loan Agreement. The Government of Uzbekistan has provided ADB with (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facilities on the basis of these terms and conditions, and (ii) an undertaking that these choices were its own independent decision and not made in reliance on any communication or advice from ADB.

33. The proposed loan will finance 65% of the total project cost. The loan will cover the entire foreign exchange cost of $23.4 million and $2.6 million equivalent in local currency cost. The beneficiaries and private sector will contribute about $3.4 million for preparation of demonstration plots, maintenance of the RBAC facilities, and counterpart investment and working capital for ASCs and seed enterprises. The Government will provide the remaining $10.6 million equivalent. For agricultural enterprise development, the Ministry of Finance (MOF) will enter into subsidiary loan agreements for $10.1 million on behalf of the Borrower and two

PFIs for on-lending to ASCs and seed enterprises.[15] A summary of the proposed financing plan is in Table 2. Details of the project financing arrangements are in Appendix 4.

Table 2: Financing Plan
($ million)

Source	Foreign Exchange	Local Currency	Total Cost	Percent
Asian Development Bank	23.4	2.6	26.0	65
Government	0.0	10.6	10.6	26
Beneficiaries	0.0	3.4	3.4	9
Total	**23.4**	**16.6**	**40.0**	**100**

Source: Asian Development Bank estimates.

F. Implementation Arrangements

1. Project Management

34. A project steering committee (PSC) will be formed to provide policy guidance to RRA in implementing the Project and to review the Project's reform and development impacts. The PSC will be headed by a deputy prime minister and comprise senior staff of the Cabinet of Ministers (COM), MAWR, Ministry of Economy (MOE), MOF, and other concerned agencies. To facilitate technical coordination and project resource allocation among agencies involved in the Project, a project working group (PWG) will be formed, chaired by MAWR. The group will comprise technical staff of MAWR, RRA, COM, MOE, MOF, State Committee for Nature Protection (SCNP), State Committee for Land Resources (SCLR), State Center for Seed Quality Control and Certification, concerned agencies, and representatives of local governments, ADPF, farmers' organizations, and PFIs. The PSC and PWG will be formed before loan effectiveness. Project implementation and fund flow charts are in Appendix 5.

35. As the executing agency, RRA will be responsible for the overall project management and coordination. A PMO will be established within RRA and 3 PSOs will coordinate and monitor activities in the project districts.

36. AGCLRI and the Plant Pathology Department of PGI will implement the wheat varietal development subcomponent. They will be accountable to the PWG for the accomplishment of project targets and resources used. SCVT will build the capacity of MAWR to regulate crop varietal development. SCVT performance will be monitored by PWG through the Office of the Minister of Agriculture and Water Resources.

37. Extension services in the project districts will be carried out by RBACs. Activities and performance of RBACs will be evaluated by ADPF, which, in turn, will be accountable to the PWG. The CAIIR, AIME, and PPI will implement the subcomponent for technological development and pest monitoring. These institutes will be accountable to the PWG through MAWR's Scientific Production Center for Agriculture. The subcomponent for irrigation and drainage system repair will be implemented by MAWR's Water Resources Department, and RBACs will support operations of the WUAs. In coordination with RRA and MOF, PFIs will implement the component for agricultural enterprise development.

[15] The terms of subsidiary loan agreement will not be softer than those of the ADB's loan to the Government.

2. Procurement

38. Farm machinery, field and laboratory equipment, minor civil works, vehicles, office equipment, and materials required for project implementation and monitoring will be procured following ADB's *Guidelines for Procurement*. Equipment and material procurement contracts estimated to cost the equivalent of $500,000 or more will be awarded on the basis of international competitive bidding (ICB). Contracts costing less than $500,000 will be awarded on the basis of international shopping procedures acceptable to ADB. Small supply contracts and training activities costing less than $100,000 will be procured through direct purchase. The award of all equipment contracts will be subject to approval by ADB.

39. Each civil works contract estimated to cost the equivalent of $1,000,000 or more will be awarded on the basis of ICB procedures as described in ADB's *Guidelines for Procurement*. Civil works contracts costing less than $1,000,000 will be carried out on the basis of local competitive bidding procedures acceptable to ADB. An indicative list of procurement packages is in Appendix 6.

40. For procurement of goods and services financed by subloans made out of the proceeds of the loan, subborrowers will need to demonstrate that the procurement procedures adopted are transparent, efficient, and conform with ADB's *Guidelines for Procurement* and *Anticorruption Policy*. PFIs will certify to ADB that the goods and services financed by the subloans are procured from ADB member countries. Where the value of goods financed by a subloan exceeds $1 million, a preshipment inspection certificate from a reputable agency, acceptable to ADB, will be required.

3. Consulting Services

41. The Project will provide for 31 person-months of international and 42 person-months of domestic consultants. The international consultants will help administer the project, monitor and evaluate project impacts, upgrade wheat breeding and varietal selection, develop effective extension services, and evaluate the suitability of PFIs to take part in the Project. Domestic consultants will help organize WUAs to improve the operation and maintenance of irrigation facilities; and help build RBAC capacity in extension service delivery, project impact evaluation, and PFI evaluation. Banking experts will be engaged through individual contracts to evaluate the PFIs. Other consultants will be provided by an international consulting firm in association with a domestic consulting firm to be engaged by RRA in accordance with ADB's *Guidelines on the Use of Consultants* and other arrangements acceptable to ADB for the engagement of the domestic consultants. An outline of the terms of reference for consultants is in Appendix 7.

4. Advance Procurement Action

42. To expedite project implementation, vehicles, field and laboratory equipment, and consultant services may be procured in advance. The Government has been informed that (i) advance action will cover actions up to, but not including, contract signing; and (ii) approval of advance action does not commit ADB to finance the Project.

5. Accounts

43. After loan effectiveness, an imprest account will be established at the Central Bank of Uzbekistan or a commercial bank acceptable to ADB to facilitate the timely release of loan funds. Thereafter, once the PMO has established an adequate accounting system for the

Project, the ceiling for the imprest account will be based on estimated expenditures in six months. The use of ADB's statement of expenditure procedures will be considered in the first year of project implementation, assuming the establishment of RRA's separate accounting system and internal control procedures for the Project. For the subloans provided through PFIs, RRA and PFIs will collect supporting documents and prepare withdrawal applications and furnish them to ADB. The establishment of the imprest account and disbursement of subloans under the Project will be in accordance with ADB's *Loan Disbursement Handbook* and other procedures agreed upon by ADB and the Government.

6. Audit

44. RRA will keep separate accounts and financial statements for the Project, which will be audited annually by independent auditors acceptable to ADB. Loan proceeds will be used to engage auditors acceptable to ADB. Certified copies of the audited financial statements will be submitted to ADB within six months after the end of the fiscal year. ASCs and seed companies receiving subloans under the Project will also be required to provide audited financial reports acceptable to MOF, PFIs, and ADB.

7. Reports

45. RRA, through the PMO, will submit quarterly and annual reports to ADB, indicating progress made and problems encountered, steps taken to remedy them, and a proposed program of activities and outputs for the next reporting period. RRA will also provide other reports and information relating to the Project as ADB may reasonably request, including the Project's environmental impacts, dialogue with beneficiaries, and social issues relating to the Project. Within three months after the physical completion of the Project, RRA will submit to ADB a project completion report detailing, among other things, information on project implementation, use of project funds, and the extent to which project objectives have been accomplished.

8. Monitoring and Evaluation

46. To monitor the Project's economic, social, and environmental impacts, a monitoring and evaluation (M&E) unit will be formed within the PMO. The unit will have two full-time staff with expertise in economics and environmental monitoring, and will (i) monitor the delivery of project benefits to targeted recipients; and (ii) evaluate the Project's economic, social, and environmental impacts. With assistance of the M&E consultants, and in cooperation with the local governments, the unit will develop a project M&E system for key project performance indicators such as household welfare (farm receipts, household incomes, household access to food) and efficacy of policy reforms in liberalizing farm-level decision making, enhancing crop prices, and increasing state revenues. M&E should also evaluate the impacts of subloans provided to ASCs and seed enterprises. Participation of women in the project-sponsored research, training, and farm extension will also be monitored. A socioeconomic profile of the beneficiaries will be prepared at the start of project implementation. The profile will be updated at project completion, and a report will describe the project benefits and impacts.

47. Environmental monitoring will include analysis of soil and water samples in the project districts to assess the impacts of increased application of agrochemicals and salt leaching. Field inspection will also be strengthened to ensure that expansion of rain-fed wheat farms will not encroach on grassland and marginal desert zones (para. 64).

9. Midterm Review

48. The Government and ADB will jointly carry out a midterm review at the end of the third year of project implementation. The review will assess, among others, (i) project implementation progress; (ii) performance of project stakeholders, consultants, and contractors; and (iii) compliance with assurances stipulated in the Loan Agreement. Project impacts will also be assessed covering aspects outlined in paras. 46–47.

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IV. TECHNICAL ASSISTANCE

49. An associated grant-financed TA will be provided to complement the Project. The TA will support reforms in agriculture, particularly in the wheat subsector. TA activities will be grouped into two components: (i) facilitating private sector entry into seed production and operation of ASCs in the focus districts, and (ii) supporting the government review of wheat production and marketing policies (Appendix 8). The first component will help potential investors in seed companies and ASCs (i) better formulate their business visions and strategies, and (ii) secure commercial financing for the companies' operations. The component will also help (i) build an understanding in the central and local governments of how the private sector can help develop the agriculture sector, (ii) identify reforms to facilitate private sector participation in the sector, (iii) build the capacity of RBACs to deliver business advisory services to private entrepreneurs and farmers, and (iv) ASCs and seed enterprises develop growing contract schemes and extend preproduction credit to farmers. The second TA component will help MAWR, MOF, and MOE identify market mechanism by which grain prices and output can be stabilized and food security achieved in a cost-effective manner. Viable options include the introduction of buffer grain stock management, price and tax incentive schemes, and flexible trade policies.

50. The total TA cost is estimated at $600,000 equivalent, of which $400,000 equivalent will be financed on a grant basis by the Japan Special Fund funded by the Government of Japan. The TA will provide for 12 person-months of international and 15 person-months of domestic consultants. The consultants will be selected and engaged in accordance with ADB's *Guidelines on the Use of Consultants* and other procedures acceptable to ADB for the engagement of domestic consultants. The TA will commence in the first year of project implementation and be completed in 10 months.

V. PROJECT BENEFITS, IMPACTS, AND RISKS

A. Financial and Economic Analyses

51. Financial and economic analyses have been carried out to assess the attractiveness of wheat cultivation and the sustainability of project investments under current and future—more liberalized—market environments. The current (financial) price regime assumed the implementation of existing policies as of 2003. This scenario assumed the alignment of state procurement prices for wheat and cotton to international prices and abolition of state control of the cropping patterns (para. 9). The financial analysis also assumed the adoption of reduced procurement quotas for wheat and wheat seeds as outlined in the project assurances (para. 69). For the crop budget analysis, as of October 2002 the state procurement prices for wheat and cotton were estimated at 30% and 52% below their economic parity prices, respectively, while traded agrochemicals are 27-35% below their economic prices. The divergence between the financial and economic prices has been attributed mainly to the divergence of the official and

market exchange rates. A shadow exchange rate factor of 1.3 was used.[16] In accordance with market standards, wheat seed prices are calculated at 50–200% over the commercial grain prices, depending on genetic purity. Market prices for wheat, for above-quota sales by farmers, were estimated at 20% over the state procurement prices based on data for 2001–2002. A liberalized policy environment assumes the convergence of financial prices toward economic prices and termination of the procurement quota system.

1. Comparative Analysis of Wheat Production

52. Financial and economic gross profits of 11 crops grown in Central Asia, including wheat, have been estimated to assess the attractiveness of wheat cultivation under the current and liberalized policy environment. Crop budget models were developed to assess crop profitability in three growing areas: well-irrigated, irrigation-deficit (Glossary), and rain-fed areas. The assessment showed that wheat, on average, generates positive farm incomes in the three growing areas (Appendix 9, Table A9.1). In the irrigation-deficit area, wheat provides the highest financial and economic returns among the crops evaluated. In the rain-fed system, crops with limited demand, such as chickpeas and sesame provide higher return than wheat. Due to their drought tolerance, chickpeas and safflower can be grown in rotation with wheat to maximize and stabilize farm incomes. On well-irrigated land, wheat generates less income than cotton; vegetables (potatoes, tomatoes, and onions); wheat seed; and fodder crops. Depending on farmers' preference, irrigated wheat can be grown in rotation with cotton to stabilize farm incomes. However, this rotation cannot be sustained for many years as it will result in the deterioration of soil and yields of both crops. Overall the assessment concluded that wheat is a financially and economically attractive crop, particularly for the irrigation-deficit and rain-fed areas.[17] On well-irrigated land farmers may choose to grow wheat for food security and income stabilization.

2. Financial Analysis

53. Financial analyses have been conducted for farms, ASCs, and seed companies. For representative farms, projected income is expected to increase over the next decade. For representative rain-fed farms, annual income is projected to rise from SUM18,950 ($19) per ha to SUM48,840 ($50) as a result of project interventions (Appendix 9). Incomes from irrigated farms were estimated to rise from SUM100,300 ($102) per ha to SUM350,700 ($360). For irrigated farms producing wheat seed, returns are expected to rise from SUM150,000 ($154) per ha to SUM357,000 ($365) in year 10.

54. Financial analysis of ASCs was carried out over 25 years for the discounted cash flow analysis, and 15 years for financial projections. Based on models of existing operations, the project ASCs are expected to carry out diversified lines of business including farm machinery hire and repair services, flour milling, and cotton/safflower oil extraction. The analysis found that the projected financial internal rate of return (FIRR) for ASC is 27.5%. Estimated performance and creditworthiness ratios are satisfactory, with the earnings-to-sales ratio rising from 17% to 34% over 15 years, and debt-to-equity ratio falling from 3.3 to 1.6 in four years. ASC performance is sensitive to rising fixed and variable costs and to the level of annual turnover. Shortfalls in turnover as a result of poor management, excessive machinery downtime, or problems with service marketing, will erode projected profits (Appendix 9, Tables A9.2–A9.3.)

[16] The price divergence on cotton is higher due to additional taxes on cotton ginning (processing).
[17] Estimated size of irrigation deficit areas in each oblast is in Supplementary Appendix B.

The financial analysis of the representative seed companies also confirmed the financial viability of investment in seed processing, with an estimated FIRR of 34.3% over 15 years.

3. Economic Analysis

55. The economic analysis was carried out using the domestic price numeraire method, with adjustments made to remove taxes and duties and to apply a shadow exchange rate factor of 1.3 to the border prices of traded goods. In view of substantial unemployment and underemployment in the rural sector, a shadow wage rate factor of 0.8 was also applied. Quantification of incremental benefits arising from the project interventions was limited to benefits resulting from improved wheat yields. This approach excluded project benefits expected from the shift of the cropping pattern in well-irrigated lands from wheat to higher-value crops, made possible by the increase of wheat yields. The analysis also excluded expected increase in profits from crops other than wheat arising from better crop rotation regimes. The analysis therefore relied on conservative benefit estimates. Over a 25-year impact period, the Project is expected to yield an economic internal rate of return of 31%. The attractive return is attributed to the relatively low project investment costs and high incremental benefits expected from the support of agricultural research and adoption of technologies planned under the Project. A sensitivity analysis also showed the robustness of the projected returns in response to variations in the cost-and-benefit streams. Details of the economic analysis are in Appendix 9.

B. Cost Recovery

56. An estimated 65% of project costs will be recovered through users' fees and subloan repayment. Seed farms will be required to repay the repair costs of on-farm irrigation/drainage facilities to be agreed on between farmers and MAWR.[18] The repayments will be collected through a 25-year betterment levy, the mechanism of which is being implemented under AADP. The state will shoulder the costs of (i) minor repairs of inter-farm collector drainage, and (ii) institutional building of WUAs and introduction of irrigation service fees in the three project districts. ASCs and seed companies, to be established as private commercial entities, will repay their subloans.

57. Because of low farmers' awareness of the benefits of new technologies and the undeveloped legal framework for royalty collection, the costs of wheat-breeding research, variety testing, and initial phase of technology dissemination under the Project will not be recovered through users' fees but, indirectly, through taxation of the more productive agriculture sector. Similarly, expenses to develop and adapt improved farming practices (laser land leveling, reduced tillage, direct seed drilling, and alternative crop rotation) by AIME and CAIIR, and pest monitoring by PPI will not be directly recovered through users' fees. To help establish the RBACs, the Project will pay for their operating costs in the first two years of their operation.

C. Social and Poverty Impacts

58. The Project will help improve the standard of living in the project area by reducing household vulnerability to food shortages, creating jobs, and improving incomes. An estimated 217,000 rural people, at least 31% poor, are estimated to directly benefit from the Project. Poverty incidence is highest in Kashkadarya, at 63%, or more than twice the national average of

[18] Comprehensive repair is estimated to cost $906 per hectare. Actual cost, however, may be lower depending on farmers' needs and willingness to pay.

28%. Djizak also has a poverty incidence slightly higher than national average, at 30%. The more fertile and better irrigated Tashkent and Syrdarya have lower poverty incidence rates at 17% and 8%, respectively.

59. A participatory rural assessment in the project area suggested that the most impoverished rural families are those that provide semiskilled and unskilled labor to shirkat and private farms. These families suffer from a lack of jobs; low wages; delayed wage payment; and declining availability of rural social services (school, clinics, and water supply) that used to be provided by their shirkats.[19] On farms that are less productive and have difficulties meeting their wheat procurement quotas, workers are particularly vulnerable as they have little wheat for their own consumption or for sale to the local market after their farms meet their quotas. The incidence of poverty is consequently higher where land is less productive, such as in Kaskadarya and Djizak. Other vulnerable groups are households with one income earner, no off-farm employment skills,[20] and those with handicapped and elderly members. Because of limited alternative livelihood options, low-income families are ironically the most dependent on their household (backyard) plots, which were allocated by local governments. These households devote more than half their income to food. Less impoverished households are those that have access to nonagricultural employment or reside near urban areas, and thus are able to cultivate fruits and vegetables for cash income.

60. Improved wheat production in the project area will benefit farm workers in the private and shirkat farms as higher production will result in higher surpluses over and above state procurement quotas. Incremental yield increases of 0.30–0.40 t/ha envisaged by 2008 will, conservatively, raise calorie supply by 182–505 calories per person per day, or 9–24% of the food-based poverty threshold of 2,100 calories per person per day, used as the regional benchmark. Envisaged incremental increase in calorie availability per person is greater for the rain-fed farms, at 346–505 calories per person per day, compared to the irrigated shirkat farms, at 182–386 calories per person per day, suggesting that the poorer farms and households in rain-fed and irrigation deficit areas will particularly benefit from the project interventions.

61. Some 30–70% of rural households in Kashkardya, Samarkand, and Djizak grow wheat in their backyard plots to ensure food supply. The urban and rural poor (e.g., retirees and the unemployed) not employed by the private and shirkat farms will likewise benefit from the use of improved wheat varieties grown in their dekhan and backyard plots. Because of intensive management, wheat yield in backyard plots is on average 60% higher than in shirkats. The main project benefits to backyard farm operators will be wheat that is resistant to pests and diseases, and provides better flour quality. Project interventions to improve wheat yields are pro-poor because poor families derive most of their calorie intake from staple food.

62. The Project will also increase seasonal farm employment. In irrigated areas, higher wheat yield will allow substitution of wheat for cotton and vegetable, which cultivation is more labor intensive. Improved resistance and enhanced soil fertility management for rain-fed wheat will also stabilize wheat cultivation areas in the less irrigable and rain-fed lands. The Project is estimated to generate an additional 42,500 person-months of employment per annum by 2008. The most significant gender impact of the Project will be increased demand for weeding in rain-

[19] Rural residents in the project area have poorer access to basic social services than urban inhabitants, with children on average having longer (three years) schooling. Access to drinking water, sanitation, and heating gas is likewise substantially lower in rural areas

[20] Wage rates in the communications sector in 2000, for instance, were 185% of those in agriculture. In real terms an agricultural worker on a shirkat farm receives the equivalent of SUM3,500 per month, not accounting for wage arrears. While workers on private farms do not necessarily receive higher wages, they are usually paid on time.

fed wheat farms and for cotton harvesting in irrigated areas in the spring and summer—tasks usually performed by women and young adults. A consultative approach to extension will be adopted to ensure that women participate in the project activities such as farm extension and demonstration. A summary poverty reduction and social strategy is in Appendix 10.

D. Environmental Impacts

63. The Project is expected to improve soil and water quality in the project area. Introduction of sustainable crop rotation regimes such as combination of legumes and wheat, balanced fertilizer application, and minimum soil tillage techniques will help improve soil structure and fertility, and conserve moisture. Improved on-farm drainage will reduce soil salinity. Due to financial stringency in the past decade, agrochemical and machinery use have fallen considerably. Therefore, potential adverse impacts of having more fertilizer and farm machinery are expected to be negligible. The sales of fertilizers and agrochemicals by the project ASCs at market prices will not likely to result in an overuse of these farm inputs.

64. A potential adverse risk may arise from repairing drainage facilities in the seed-growing areas in the project districts. To reduce salinity level, soil will be leached with irrigation water once drainage is improved. Leaching could increase salt release to surrounding rivers and water bodies. The risk will be mitigated by helping the SCNP monitor the release of drainage water by farmers and test the on- and off-farm soil and water quality. The Project's environmental assessment also recognized that introducing drought-resistant wheat varieties may result in expanding wheat cultivation to grassland and marginal land in the medium and long term. As Uzbekistan has developed zone maps that satisfactorily distinguish cultivable, grass, and marginal lands, the Project will enhance field monitoring of farm expansion. This task will be performed by the State Committee for Land Resources.

65. The Project is expected to have a neutral to positive environmental impact on the desertification and salinization of the Aral Sea region. The Aral Sea, in Western Uzbekistan, is fed by the Amudarya and Syrdariya rivers. Decreasing stream flows because of excessive diversion of the river water has resulted in the desiccation of the sea. Project interventions, in the upstream reaches of the two rivers, such as direct seeding, minimum tillage, alternate furrow irrigation, and land leveling, will help reduce water demand. The project interventions, combined with implementation of a sustainable and enforceable water sharing agreement among local administrations and countries in the region, would contribute to substantial reduction of water diversion in the Aral Sea basin. An initial environmental examination report for the Project is in Supplementary Appendix H.

E. Project Risks

66. A number of factors may hamper project implementation and sustainability of benefit impacts. Economic and agriculture policies remain deficient, including overvaluation of the local currency, which has undervalued agricultural commodity prices, subsidized farm inputs, and constrained enterprise access to foreign currencies and imported goods. The project financial analysis shows that project investments will be sustainable under the current policy environment with reforms in the wheat and wheat seed procurement system (para. 52). The project crop budget analysis showed that liberalizing the exchange rate restrictions, which will devalue the sum, will raise net farm incomes because the resulting increase in the cotton and wheat prices will more than compensate for the rise in the farm input costs. To ensure that private ASCs and seed companies can operate competitively, the Government has agreed to ensure that they will

have access to imported goods and foreign exchange equal to that given to state-owned or -controlled enterprises (para. 70).

67. The policy to maintain high wheat outputs could weaken the domestic market price of wheat and has imposed substantial budgetary costs on the state. The Government has thus adopted measures to lower aggregate wheat production by lowering grain procurement quotas (para. 10). The Government is reviewing alternative mechanisms and policies to stabilize wheat prices and output in a market context. To this end, the service of a grain policy expert will be provided under the TA associated with the Project to help analyze international best practices in grain price stabilization policies (paras. 49–50).

68. AADP's experience suggests that implementation issues experienced during the earlier years of ADB operation in Uzbekistan (1996–2000), such as shortage of counterpart funds and inadequate cooperation among agencies, have been addressed by the Government and are not likely to hamper project implementation. To mitigate potential project implementation risks, the Project will provide adequate staff training and consultant inputs to RRA, RBACs, research institutes, and regulatory agencies to ensure that these entities can deliver the envisaged project outputs. Activities of the institutes and agencies will be coordinated by sub-working groups under the PWG to ensure accountability for project resources. The project institutional arrangements were also developed to ensure that the tasks assigned to agencies coincide with their mandates, thus ensuring the institutionalization of capacity building gained under the Project. To mitigate delays in project implementation, training in ADB operational policies and procedures has been and will be provided to RRA and PMO staff. Job descriptions and qualification requirements have also been developed, and RRA gave the assurance that qualified staff acceptable to ADB will be assigned to the PMOs, PSOs and PWG to support project implementation.

VI. ASSURANCES

69. As a condition of loan effectiveness, COM will adopt a resolution determining that:

(i) Commencing from the cropping season of 2004, the obligatory state procurement quotas for wheat will not exceed 8,900 tons for Kuyi Chirchik, 7,000 tons for Zamin, and 6,800 tons for Katakurgan. Farms and individual farmers will be entitled to sell their above-quota wheat to buyers at market prices or to the state at prices agreed on by farmers and the state.

(ii) Commencing from the cropping season of 2004, the obligatory state procurement quotas for wheat seed will not exceed 445 tons for Kuyi Chirchik, 350 tons for Zamin, and 340 tons for Katakurgan. Farms and individual farmers will be entitled to sell their above-quota wheat seeds to buyers at market prices or to the state at prices agreed on by farmers and the state.

(iii) Each agricultural enterprise or farm in the project districts shall be responsible on an individual basis to meet the procurement quotas assigned to the enterprise or farm.

(iv) Except for the procurement quotas outlined in items (i) and (ii) of this paragraph, restrictions will not be imposed with regard to the buyers and the terms of sale of wheat and wheat seeds to be sold by the agricultural enterprises and farms in the project districts.

(v) A PSC will be established, and its composition determined.

70. The Government has given the following assurances, in addition to the standard assurances, which are incorporated in the legal documents:

(i) In procuring wheat and wheat seeds, the Government will ensure that farmers in the project areas receive their advance preproduction financing on time, and final payments for wheat and wheat seeds will be remitted within three months after crop delivery.

(ii) The Government will review annually the state procurement prices for wheat and wheat seeds to ensure that any price adjustments fully reflect, for each quality grade, variations in international prices, changes in exchange rates, and reasonable charges for processing and marketing costs of wheat and wheat seeds.

(iii) The Government will promote private sector participation in the production and marketing of wheat and wheat seeds and will facilitate the establishment of privately owned ASCs and seed companies. The Government will ensure that licenses or other approvals will not be required to establish and operate ASCs, except to certify their compliance with sanitary and environmental regulations. The Government will facilitate and streamline approvals and issuance of licenses to establish seed companies.

(iv) The Government will ensure fair market competition between the privately owned ASCs or seed companies and state- and local government-owned or -controlled enterprises.

(v) The Government will ensure that ASCs and seed companies in the project districts will be given equal access to supply of necessary materials on the same terms as any state-owned or -controlled enterprise. In particular, the Government will ensure that ASCs and seed companies will have access to agrochemicals, fuel, spare parts, and foreign exchange on terms not less favorable than those applicable to any state-owned or -controlled enterprises.

(vi) The Government will not restrict where ASCs and seed companies may operate, or their ability to competitively procure their inputs and sell their products and services within and outside their districts. In marketing wheat seeds, seed companies will give due consideration of MAWR's recommendations on the agro-climatic suitability of wheat varieties.

(vii) The Government will abolish by 31 December 2005 all direct and indirect subsidies to state-owned or -controlled machine and tractor parks in the project districts.

(viii) The Government will not interfere with business decisions of ASCs and seed companies**.** The Government will not regulate the prices of farm inputs and outputs and preproduction financing terms between farmers and ASCs and the seed companies, and will allow seed companies and other private agricultural enterprises to determine prices freely based on market conditions. State seed

procurement prices will apply to seed quotas allocated to seed companies in the project districts. Quotas are limited to those referred to in para. 69.

VII. RECOMMENDATION

71. I am satisfied that the proposed loan would comply with the Articles of Agreement of ADB and recommend that the Board approve the loan of $26,000,000 to the Republic of Uzbekistan for the Grain Productivity Improvement Project from ADB's ordinary capital resources with interest to be determined in accordance with ADB's LIBOR-based loan facility; a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft Loan Agreement presented to the Board.

Tadao Chino
President

23 October 2003

PROJECT FRAMEWORK

Design Summary	Project Targets/ Verifiable Indicators	Means of Verification	Risks/Assumptions
Goal Increase farm income	Average operating margin for rain-fed farms in project districts rise from SUM19,000 per hectare (ha) to SUM25,000/ha by 2008, for irrigated farms from SUM100,000/ha to SUM 160,000/ha. Operating margins for wheat seed production increase from SUM131,000/ha to SUM 250,000/ha by 2008; for rain-fed wheat from SUM 8,000/ha to SUM20,000/ha; for irrigated wheat SUM80,000/ha to SUM160,000/ha	Project monitoring and evaluation (M&E) surveys, project completion, and project performance audit reports Provincial (oblast) and district level statistics Farm financial and technical reports Impact evaluation, including collection of gender-disaggregated data	The Government will gradually lower obligatory state procurement quotas and ease price and quantity control on farm inputs. Social and macroeconomic environment are stable and supportive of investment in the agriculture and rural sector.
Purpose Promote wheat production in the project area in an economical and sustainable manner • Stabilize and increase wheat yields in the project rain-fed and irrigated areas • Develop robust private companies providing agricultural services in the three project districts • Improve domestic wheat flour quality	Increase average yield of rain-fed wheat in the districts from 0.6 ton (t)/ha to 1.2 t/ha by 2008. Yields will not fall below 1.0t/ha during 2007–2009. Increase average yield on irrigated wheat in the districts as follows (t/ha): 2002 2008 1: 3.0 3.4 2: 2.4 3.0 3: 3.1 3.4 1 = Kuyi-Chirchik, 2 = Zamin, 3 = Katakurgan. Increase average yield on rain-fed wheat in the five project oblasts from 0.6 t/ha to 1.0 t/ha by 2008. Increase area under rain-fed wheat in the project districts from 24,000 ha in 2002 to 30,000 ha by 2008 In the districts, farmers plant 33% of the sown rain-fed land with crops (such as legumes) in rotation with wheat Increase the area of rain-fed wheat in the project oblasts from 295,000 ha to 330,000 ha by 2008, and reduce cultivation of wheat in well-irrigated areas. Private companies provide 30% of wheat seed sales and machinery rental revenues (by value) in the districts	Ministry of Economy and Ministry of Agriculture and Water Resources (MAWR) annual statistics. Project review mission. Farm technical and financial reports. Impact evaluation survey. Project performance audit.	Domestic markets for fodder and/or non-grains are sustained. Targeted total irrigated areas mandated for wheat production are not increased.

Design Summary	Project Targets/ Verifiable Indicators	Means of Verification	Risks/Assumptions
	Improve the baking quality of wheat flour produced in the oblasts.		
Outputs **1. Varietal Development and Testing**			
• Release of locally adapted wheat varieties in five oblasts • Improved availability of domestically produced foundation wheat seeds	Six new locally adapted wheat varieties registered and released by 2008 Andijan and Galla-Aral Cereals and Legumes Research Institute (AGCLRI) capacity to multiply foundation seeds increases from 400 tons per annum to 900 tons by 2008 Seed quality parameters (humidity, germination rate, impurities, etc.) improve in the oblasts by 2008 to match the seed label	Project quarterly and annual progress reports Project review missions and M&E studies. Consultation with seed farms and companies.	Government policy to restructure seed industry is maintained; Uz Grain Association and Andijan seed farms are prepared to relinquish some control over the seed industry. Enthusiasm of local governments and farms is established and maintained. State Center for Seed Quality Control and Certification effectively implement seed quality control regulations and charges adequate fees to recover seed certification costs.
2. Enhanced Farm Management **a. Farm Extension**			
• Improve farm and business extension services in the districts • Upgrade extension service on wheat cultivation in the oblasts	Farmers in the districts satisfied with extension services provided by rural business advisory centers Improved wheat varieties planted on 40,000 ha (60% of total wheat area) in the districts by 2008 60% of farmers in the districts are familiar with improved soil and water management technologies introduced under the Project by 2008	Project quarterly and annual progress reports Project review missions, project evaluation MAWR data	Rural business advisory centers maintain qualified staff. Enthusiasm of local governments and farms is established and maintained. Farmers, particularly private and *dekhan* (Glossary) farmers, participate actively in extension and demonstration activities.

Design Summary	Project Targets/ Verifiable Indicators	Means of Verification	Risks/Assumptions
b. Technology Development			
• Enhance MAWR's capacity to introduce and disseminate alternative on-farm soil and water management practices suited for crop rotation involving wheat	30% of farmer in the oblasts are familiar with improved soil and water management techniques introduced under the Project by 2008 Improved wheat varieties planted on 150,000 ha in the oblasts and 225,000 ha nationwide by 2008 Accurate monthly assessment of pest infestation risk, particularly locusts, disseminated in the oblasts	Project quarterly and annual progress reports. MAWR statistics Project review missions, project evaluation assessment	Project institutes: Agricultural Institute for Mechanization and Electrification, Central Asian Institute for Irrigation Research, and Plant Protection Institute maintain qualified staff.
c. Irrigation Facility Repair			
• Improve drainage and irrigation water supply for seed-growing farms in the districts • Upgrade irrigation system operation and maintenance	Drainage improved in 6,000 ha of seed-producing areas in the districts Irrigation water supply stabilized in the project districts 30 independent water users' associations formed in the districts.	Project quarterly and annual progress reports. MAWR and district statistics Project review missions, project evaluation assessment	On- and off-farm systems are maintained after rehabilitation.
3. Agricultural Enterprise Development			
• Sustained development of private enterprises providing agricultural input supply, processing and marketing services	Agricultural service centers (ASCs) under the Project benefit 14,000 ha per annum ASCs created under the Project remain financially profitable during 2004-2008 Private seed enterprises established in the project oblasts remain financially profitable during 2004-2008 8,500 tons of high-quality elite and certified seeds are produced in the project districts annually by 2008	Project quarterly and annual progress reports. Audited financial reports of companies Reports of commercial banks Project review missions	Equipment rental rates remain affordable to farmers. Local wheat and cotton prices are linked to international prices, allowing farmers and ASCs to hedge against exchange rate fluctuations. State and local government involvement in business operations of ASCs and seed enterprises is minimized.

Design Summary	Project Targets/ Verifiable Indicators	Means of Verification	Risks/Assumptions
	A plan is developed for further private sector participation in agricultural support services and marketing for the three districts		Preferential subsidy or treatment is not continued to machinery and tractor parks in the districts, which will compete with the ASCs created under the Project. Access of working capital, materials, and foreign exchange are adequate for ASCs and seed companies.
4. Activities/Inputs • Land and building acquisition • Provision of information material • Civil works • Equipment purchase • Vehicles • Farm equipment • Training • Consulting services • Project administration • Incremental recurrent budget	Quantities of inputs as estimated in the detailed cost estimates Monitored gender development targets outlined in the Gender Action Plan (Appendix 10)	Project progress report Project Performance Monitoring System reports Project Completion Report Postevaluation report	Sufficient local counterpart funds are available and provided in a timely manner.

SECTOR AND SUBSECTOR ANALYSIS

A. Agricultural Sector Development

1. Arable land represents less than 10% of Uzbekistan's total land area. Of the total arable area of 4 million hectares (ha), 3.7 million ha are devoted to irrigated agriculture, and the remaining to rain-fed production. A high proportion of agricultural production is concentrated in the fertile irrigated area in the central and eastern regions of the country, while rain-fed areas are mostly used for grain production. Crops comprise 60% of agriculture output, by value, with cotton and wheat as two major commodities; and livestock, 40%. About 56% of the country's 25.6 million people live in rural areas. Agriculture accounts for about 28% of the gross domestic product (GDP), 44% of employment, and 60% of export revenues.

2. Agriculture development of independent Uzbekistan has centered around three strategic thrusts: (i) generate foreign exchange earnings—mainly through the sale of cotton, (ii) improve food security, and (iii) improve social stability and rural incomes. As a part of the former Soviet Union (FSU), Uzbekistan was the largest producer of cotton, fruits, and vegetables. About 70% of its total irrigated land was allocated to cotton. Fodder crops (e.g., alfalfa and legumes) were grown in rotation with cotton and supported limited livestock production. During the 1990s Uzbekistan gradually increased wheat production while maintaining the level of cotton production. In 1993–2000 cotton-fodder crop rotation was slowly replaced by cotton-wheat rotation. Fodder crop area fell from 1.0 million to 0.5 million ha, while cotton area fell slightly from 1.70 million to 1.45 million ha. In contrast, the area under wheat rose from 0.7 million in 1993 to a peak of 1.5 million ha in 1997, before declining to 1.3 million ha by 2002. Aside from farmers' concern over food security, expansion of the wheat growing area was driven by (i) the imposition of rising government mandatory production targets and procurement quotas on wheat (para. 7); (ii) weakening cotton prices; and (iii) declining irrigation supply during the summer months, which has made cotton production increasingly risky. Accompanying the expansion in growing area, wheat yield rose from 0.9 tons (t) per ha to 3.8 t/ha. The yield improvement was largely attributed to the shift of cultivation area from rain-fed into irrigated areas and improving farmers' skills in grain cultivation. Uzbekistan's total wheat output rose from 0.6 million to 4.7 million tons in 1993–2002, and the country is self-sufficient in wheat.

B. Structure of Farms

3. In the early 1990s Uzbekistan's agriculture was still dominated by collective and state farms, 2,108 of which were in operation in 1991. Average farm size was more than 24,000 ha, and average number of workers per farm was more than 1,100. Urban and rural households operated backyard plots, outputs of which were mainly for self-consumption and supplementary cash incomes. Reforms in the farm structure began in the early 1990s with the creation of additional household plots on the collective farms assigned to the farm employees. Such plots (about a third of a hectare in size) are called *dehkan* farms (Glossary). Both existing backyard and dehkan plots produce most of the country's noncommodity crops,[1] and account for about 11% of cultivated area.

4. In 1998 four laws (the Land Code and laws on private, cooperative, and dehkan farms) were introduced. The new laws facilitated restructuring of the state and collective farms into cooperative or *shirkat* farms (Glossary). A shirkat is organized by assessing assets of a collective farm and apportioning shares in their value to farm members, who then enter into

[1] Commodity crops are wheat and cotton.

"family contracts" with the cooperative to produce crops. The shirkat is responsible for input acquisition and sales of farm products. Shirkats' management structure and style of operations, however, did not undergone substantive change compared to collective farms.

5. The 1998 law also facilitated formation of private farms. These differ from dehkan and shirkat farms in scale (typically 10–100 ha in size). Private farms can either be family- or company-owned farms and operate on long-term land leases (up to 50-years). Since 1999, shirkats with poor financial performance have been dissolved and transformed into private farms. As of 2002, there were about 72,400 private farms occupying 991,000 ha or 28% of the total irrigated area. The various types of farms and their composition in irrigated and rain-fed areas are summarized in Table A2.

Table A2: Area, by Farm Type
(area sown, '000 ha)

Area	All Farms	State and Shirkat	Private	Dehkan
Irrigated	3,541	2,145	991	405
Rain-fed[a]	440	382	30	28
Total	3,981	2,527	1,021	433

[a] Data as of 2001
Source: Ministry of Economy.

6. Creation of the dehkan and private farms has helped improve farm productivity. During 1996–2001, virtually no output growth was observed in the shirkat farms, as a group, whereas dehkan and private farms experienced significant output growth.[2] During the period, 30% of the agricultural sector output growth was generated by private farms and 70% by dehkan farms. Crop yields of private and dehkan farms were slightly higher than those of shirkats, but their production costs were much lower leading to higher farm profitability. Also, labor productivity in the private and dehkan farms were significantly higher. The achievements of private and dehkan farms have been attributed to increased control of households over farm resources, input use efficiency, and more direct linkage between farm performance and household income. As of 2002, private farms produced 27% and 38% of the country's cotton and wheat production, respectively.

C. State Order System

7. The main mechanism regulating agricultural production and marketing in Uzbekistan has been the state order system. Up to 2002, the system had regulated cropping pattern and required farms to meet production targets for cotton and wheat. Production targets in most cases, had been set at high levels achieved in the 1980s, when the irrigation and drainage systems functioned well. The policy required that 50% of the wheat production targets to be sold to the state. This quantity is known as the state procurement quota. State-determined procurement prices were applied to the first 25% of the production target (half of the quota), and a price premium of 20% over and above the procurement prices was paid to the remaining volume purchased by the state. Although farmers were free to sell wheat in the domestic markets once they had fulfilled the state quotas, only about 30% of farm actual production is usually left for free market sale because actual wheat production had been consistently below the production targets. In the case of cotton. processing (ginning) of raw cotton is still dominated

[2] World Bank's Country Economic Memorandum (CEM) for 2002

by the state-owned enterprises. As such, virtually all cotton is procured by the state. Farmers receive financial incentives in the form of additional value derived from cotton by-products.

8. In 2001–2003, reforms were introduced to the state order system. Presidential Decree on Deepening Reforms in the Agricultural Sector, dated 24 March 2003, directed the Government to abolish the state control over cropping pattern.[3] The state procurement quotas, however, remain in place. As a result of the policy dialogue under the Ak Altin Agricultural Development Project (AADP)[4] and the World Bank's Rural Enterprise Support Project (RESP), procurement quotas for cotton and wheat were substantially lowered to about 25% of the historical production levels in six pilot districts. Based on the agreement with the International Monetary Fund (IMF), the Government has agreed in 2002 to reduce the procurement quotas for cotton, nationwide, to 50% of actual, rather than the state-projected production level. In 2002 the Government also began to adjust the procurement prices for cotton and wheat to their international market prices, rather than state-estimated production costs, as practiced in the past. The price adjustment resulted in 72% and 57% increases in the wheat and cotton procurement prices, respectively, between 2002 and 2003. In line with agreements with the IMF and an intention to end the state monopoly in cotton ginning and marketing, in December 2002 the Government adopted a resolution to allow private sector participation in cotton wholesale and export.

D. Sector Challenges and Strategy

9. Despite gains in wheat output and the reforms adopted, the agriculture sector still faces key challenges. Wheat yields are highly variable, even in identical agro-ecological zones. because of the use of imported varieties. Wheat crops are susceptible to local pests and diseases and not adapted to the high temperature and low humidity in the summer months. Because of low farm profitability and inefficient delivery of farm inputs, farms are suffering from shortages of machinery, fertilizers, pesticides, and other production inputs. Irrigation and drainage facilities are deteriorating because of funding shortage. Further, overly centralized wheat seed production has contributed to high transport costs and poor seed quality. Wheat farmers need to be introduced to alternative farming practices, such as reduced tillage, selective application of water and fertilizers, reduced water application. and alternative crop rotation regimes, to reduce farming costs and improve soil fertility. Finally, the rapid increase in wheat production has required the allocation of an estimated 0.8 million ha (25%) of well-irrigated land for wheat production. This approach sacrifices the land's economic potential for cultivation of higher-value crops, such as cotton, vegetables, fruits, and seeds.

10. Sector reforms adopted in recent years (paras. 4–8) have been appropriate to stimulate productivity and improve farm income. Nonetheless, efforts are needed to ensure that reforms adopted thus far are well implemented. Additional measures are required to widen the geographical coverage of reforms and deepen their scope. Given the dominance of state-enterprises in farm input supply and agroprocessing, the reduction of procurement quotas and increase in procurement prices should be accompanied by an active facilitation of private sector participation in the farm support services. This effort is necessary to promote competition and

[3] Crop production targets had been calculated based on the obligatory land allocation to a particular crop (cropping pattern) and projected yields of crop. Abolition of control on cropping pattern, therefore, should result in abolition of the production targets.

[4] ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan and Technical Assistance to Uzbekistan for the Ak Altin Agricultural Development Project*. Manila.

introduce market mechanism at farm-gate level, and to allow farmers independent choices in determining their production and marketing decisions.

11. To address challenges in the wheat subsector, Uzbekistan's wheat production systems should be rationalized to shift wheat cultivation from well-irrigated lands to the less irrigable and rain-fed lands. To this end, the sector must accelerate the introduction of wheat varieties adaptable to local conditions and support technology extension to introduce alternative wheat farming practices.

E. Sector Institutions

12. The Ministry of Agriculture and Water Resources (MAWR) is the primary agency responsible for the implementation and monitoring of the agricultural policies. Agricultural research is the responsibility of MAWR and the Academy of Agricultural Sciences. Both agencies are represented through the Scientific Production Center for Agriculture (SPCA), whose director general is a deputy minister of MAWR for science and technology policy. SPCA has a network of 19 commodity- or subject-oriented research institutes and is responsible for scientific activities to develop new wheat varieties. The institutes have regional research stations that also provide extension services. SPCA is represented in each province (oblast) by a small unit that coordinates activities of stations within the oblast and assures communication with the local administration. The main institutes involved in grain varieties development are the Andijan/Galla-Aral Cereals and Legumes Research Institute and Plant Genetics Institute. Technology improvements of crop production, covering water and soil management, agricultural mechanization, and plant protection are, respectively, undertaken by the Central Asian Institute for Irrigation Research,[5] Agricultural Institute for Mechanization and Electrification, and Plant Protection Institute. MAWR also houses the State Commission on Varietal Testing which tests and approves plant varieties that can be commercially grown in the country.

13. MAWR's Crop Cultivation Branch**,** with a Grains Production Department and a Seed Production Department, is primarily responsible for overseeing grain production and facilitating the subsector development. The branch is headed by the first deputy minister of MAWR. In support of crop production, the State Center for Seed Quality Control and Certification under MAWR regulates seed production and marketing. MAWR's network of district offices, research stations, and affiliate state-owned enterprises have traditionally carried out information dissemination on new technologies to the collective and shirkat farms. With the growing number of private and dehkan farms, extension services will increasingly be the responsibility of the rural business advisory centers (RBACs) that has been established in each district. RBACs are organized under an umbrella national farmers association, the Association of Dehkan and Private Farmers. Further, in line with the agricultural sector's transformation to the market system, farm extension approach should be transformed from one that is directive and supply-driven to one that is demand-driven and supportive of more independent decision making at the farm level. Under the Economic Branch of MAWR, the Rural Restructuring Agency (RRA) was established in 1998 to facilitate agricultural reform—including farm restructuring—and management of foreign-assisted loan projects.

[5] The Central Asian Institute for Irrigation Research reports directly to the Minister of Agriculture and Water Resources, not the SPCA.

F. External Assistance and Lessons Learned

14. The largest loan project in agriculture thus far is the Cotton Subsector Improvement Project of the World Bank.[6] The project, implemented in 1995–2002, helped improve cotton seed quality and marketing, and introduce integrated pest management techniques and new irrigation scheduling methods in cotton production. A series of advisory technical assistance was provided by the European Union through its Technical Assistance for the Commonwealth of Independent States program to finance (i) a pilot integrated area development project, (ii) farmers' training, (iii) establishment of a food and agriculture policy unit, (iv) demonstration of improved irrigation and soil management, (v) land registration improvement, (vi) wholesale market operations, and (vii) rural enterprise development. Credit funds and capacity-building assistance were provided for agroprocessing under ADB's Rural Enterprise Development Project.[7] This assistance was continued under the Small and Medium Enterprise Development Project.[8] The ongoing AADP, approved in 2001, provides integrated assistance in irrigation and drainage system rehabilitation, capacity building of stakeholders, information extension, and establishment of a farm machinery rental enterprise in the Ak Altin district of the Syrdarya oblast. RESP supports investments in irrigation infrastructure rehabilitation, business advisory services, rural microfinance, and credit line for enterprises providing farm support services. The project covers five districts in Karakalpakstan, Andijan, Kashkadarya, Tashkent, and Surkhandarya.

15. The International Maize and Wheat Improvement Center under the Consultative Group on International Agricultural Research (CGIAR) has also provided assistance to Uzbekistan in wheat varietal improvement through supply of parent breeding materials and technical training. With partial funding of the ADB, the International Center for Agricultural Research in Dry Areas of CGIAR has also supervised pilot trials of alternative crop rotations and irrigation and soil management techniques that will enhance crop productivity with minimal incremental costs to farmers.

16. Experience under these projects suggests that RRA and MAWR have the capacity to carry out integrated research- and production-oriented projects. Implementation of the Cotton Subsector Improvement Project has built the capacity of MAWR in seed quality control.[9] For the wheat subsector, additional investment is still required to test and develop promising wheat varieties adaptable for introduction to a wide range of agroclimatic zones and produce adequate supply of foundation seeds. Likewise, improved soil and water management techniques tested under the past and ongoing projects should be disseminated over a wider geographical area.

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[6] The Cotton Sub-sector Improvement Project was approved on 25 May 1995, for $66 million.

[7] ADB. 1996. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Uzbekistan for the Rural Enterprises Development*. Manila.

[8] ADB. 2000. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to Uzbekistan for Small and Medium Enterprise Development Project*. Manila.

[9] Implementation of the project was slowed down in 1996–1998 by the lack of reform progress in the cotton subsector and weak implementation capacity of the project implementation unit. These issues had been addressed. In 2002, the project implementation was rated satisfactory.

CRITERIA FOR FINANCIAL INSTITUTIONS AND TERMS OF SUBSIDIARY LOANS

A. Funds for Onlending

1. Of the project loan, $10.1 million will be channeled through the Ministry of Finance (MOF) for onlending to participating financial institutions (PFIs). These, in turn, will on-lend to qualified private sector subborrowers who wish to establish agricultural service centers (ASCs) or wheat seed production companies in the three project districts.

B. Participating Financial Institutions

2. A maximum of two financial institutions will be selected for the Project. They must meet the following criteria:

(i) have been audited by external auditors acceptable to the Asian Development Bank (ADB), with audit reports, covering the last 2 fiscal years, satisfactory to ADB;

(ii) have a network of branches with adequate experience to extend loans to rural enterprises;

(iii) have a capital adequacy ratio of not less than 10%, to be calculated according to the Basle Agreement for International Banking Supervision;

(iv) have a loan-deposit ratio not exceeding 100%, derivation of which should exclude subloans under the Project and those backed by loans from multilateral and bilateral financial institutions;

(v) be in compliance with the regulatory requirements of the Central Bank of the Borrower; and

(vi) have adopted adequate policies and procedures for credit operations as required by the Central Bank of Uzbekistan.

3. Within six months of loan effectiveness, two suitable PFIs willing to take part in the Project will be identified by the Rural Restructuring Agency in consultation with MOF. Evaluation and screening of the candidate financial institutions will be facilitated by the project's international and local banking experts (consultants). PFI selection will be approved by MOF and ADB. Within six months of loan effectiveness, credit guidelines governing the detailed arrangements of onlending from the PFI to the end subborrowers will be drafted and approved by the Government and ADB. Within eight months of loan effectiveness, MOF and PFIs will enter into subsidiary loan agreements.

C. Subborrowers

4. Applications for subloans will be considered from private individuals (or groups of private individuals) and existing private companies (i) to establish private sector ASCs to offer farm support services within the project districts of Kuyi-Chirchik, Zamin, or Katakurgan; or (ii) to establish new or expand existing operations of a company producing wheat seeds in the three districts.

5. The subborrower must satisfy the following criteria for the duration of the subloan: (i) a maximum projected debt-equity ratio of 80:20, (ii) a projected debt service coverage ratio of not less than 1.3, and (iii) a current ratio of at least 1.3. Subborrowers will be limited-liability corporations or open joint stock corporations or suitable form of companies owned by private

parties. Corporations with government equity will not be eligible to receive subloans under the Project.

D. Size of Subloans

6. For ASCs, no subloan should be less than $100,000, or more than either $3 million or 80% of the estimated subproject costs (whichever is less), or the equivalent thereof in other currencies, calculated on the basis of current rates of exchange. For the wheat seed companies, no subloan should be less than $50,000, or more than either $1 million or 80% of the estimated subproject costs (whichever is less), or the equivalent thereof in other currencies calculated on the basis of current rates of exchange.

E. Duration of the Loan

7. Subsidiary loans from MOF to PFIs will be for a maximum of 10 years, including a maximum 4-year grace period on principal repayments. Subloans from PFIs to the subborrowers will be for a maximum period of 10 years, including a maximum 3-year grace period on principal repayments.

F. Terms of Onlending

8. The interest rate on subloans from MOF to the PFIs will be at no less than the London interbank offered rate (LIBOR) plus 2%. PFIs should on-lend subloans to subborrowers at real market interest rates to take into account the cost of funds, administrative costs of providing the subloan, credit risk, and a reasonable amount of profit for the PFIs. Commitment and front-end fees of the ADB loan to MOF will be passed on to the PFIs. PFIs will shoulder the credit risk, and subborrowers, the foreign exchange rate risk.

COST ESTIMATES AND FINANCING PLAN

Table A4.1: By Component Project Cost Summary

Item	(SUM million) Local	Foreign	Total	% Foreign Exchange	% Total Base Costs	($'000) Local	Foreign	Total	% Foreign Exchange	% Total Base Costs
A. Variety Development and Testing										
1. Plant Breeding	1,006.1	1,604.5	2,610.6	61	9	1,031.9	1,645.6	2,677.6	61	9
2. Varietal Testing	448.5	611.1	1,059.7	58	3	460.0	626.8	1,086.8	58	3
Subtotal (A)	1,454.7	2,215.6	3,670.3	60	12	1,492.0	2,272.4	3,764.4	60	12
B. Enhanced Farm Management										
1. Farm Extension	769.5	494.1	1,263.6	39	4	789.2	506.8	1,296.0	39	4
2. Technology Development	593.4	1,570.1	2,163.5	73	7	608.6	1,610.3	2,218.9	73	7
3. Irrigation Repairs	7,351.8	2,060.1	9,411.9	22	31	7,540.3	2,113.0	9,653.3	22	31
Subtotal (B)	8,714.6	4,124.3	12,839.0	32	42	8,938.1	4,230.1	13,168.2	32	42
C. Agricultural Enterprise Development	2,720.3	9,847.5	12,567.8	78	41	2,790.0	10,100.0	12,890.0	78	41
D. Project Management	986.2	632.7	1,618.9	39	5	1,011.5	648.9	1,660.4	39	5
Total Base Costs	13,875.8	16,820.1	30,695.9	55	100	14,231.5	17,251.4	31,483.0	55	100
Physical Contingencies	1,444.4	1,057.4	2,501.8	42	8	1,481.4	1,084.5	2,565.9	42	8
Price Contingencies	8,663.4	2,618.5	11,281.9	23	37	898.5	274.9	1,173.4	23	4
Total Project Costs	23,983.5	20,496.0	44,479.6	46	145	16,611.5	18,610.8	35,222.3	53	112
Interest During Construction	—	4,894.5	4,894.5	100	16	—	4,417.0	4,417.0	100	14
Commitment Fee	—	284.7	284.7	100	1	—	230.7	230.7	100	1
Front-End Fee	—	149.0	149.0	100	—	—	130.0	130.0	100	—
Total Costs to be Financed	23,983.5	25,824.2	49,807.7	52	162	16,611.5	23,388.6	40,000.0	58	127

— = not available.
Source: Asian Development Bank estimates.

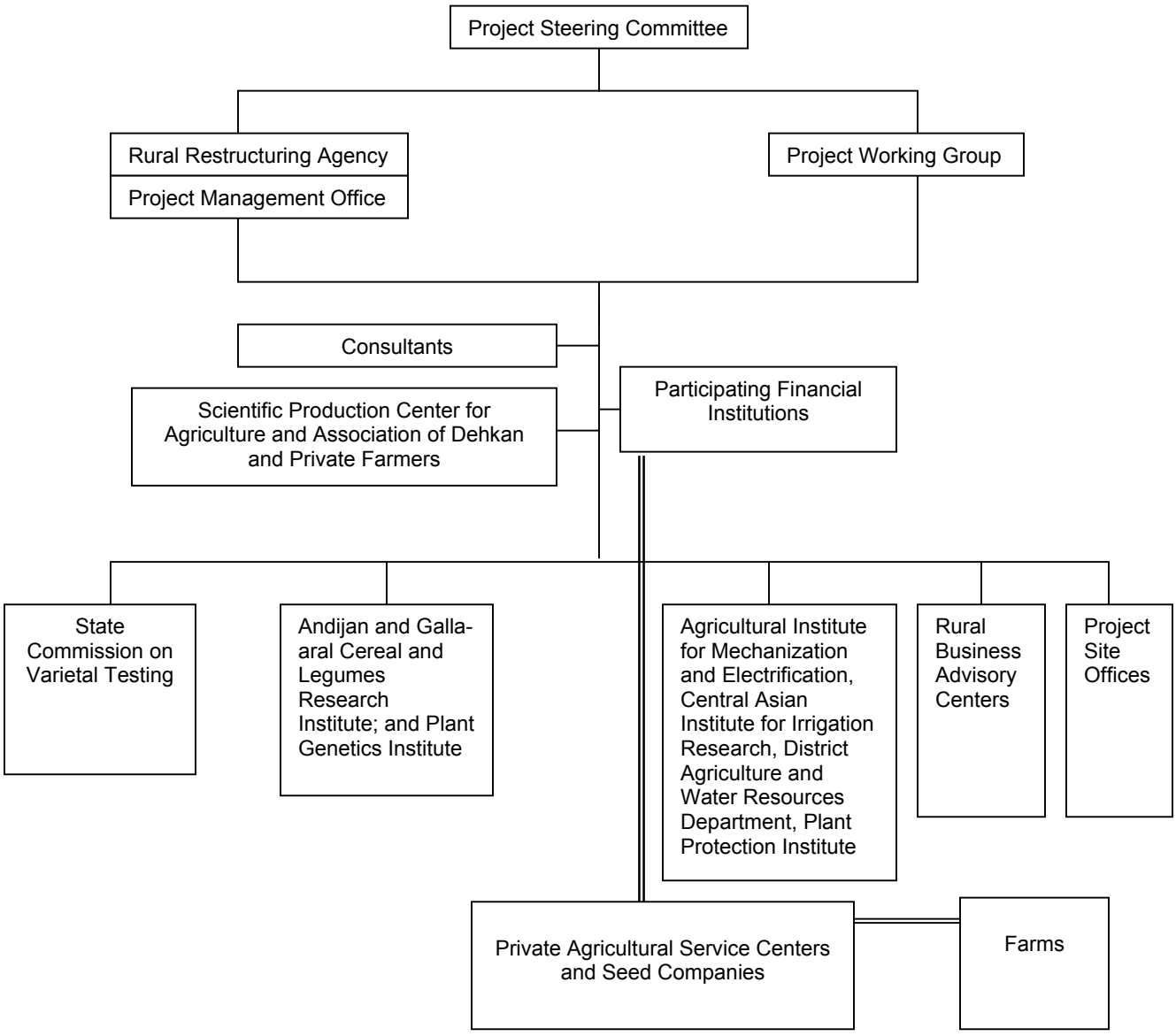
Table A4.2: Components Financiers
($'000)

Item	Government of Uzbekistan		ADB		Farmers		Private Sector		Total		Foreign Exchange	Local (excl. taxes)	Duties & Taxes
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%			
A. Variety Development and Testing													
1. Plant Breeding	922.3	29.4	2,218.1	70.6	—	—	—	—	3,140.4	7.9	1,909.9	950.4	280.1
2. Varietal Testing	367.1	29.2	889.1	70.8	—	—	—	—	1,256.2	3.1	713.8	420.4	122.1
Subtotal (A)	1,289.4	29.3	3,107.2	70.7	—	—	—	—	4,396.6	11.0	2,623.7	1,370.8	402.1
B. Enhanced Farm Management													
1. Farm Extension	109.7	7.2	1,058.8	69.7	101.3	6.7	249.8	16.4	1,519.7	3.8	584.7	795.5	139.5
2. Technology Development	404.1	15.7	2,176.6	84.3	—	—	—	—	2,580.7	6.5	1,858.6	480.7	241.4
3. Irrigation Repairs	8,511.2	73.2	3,124.0	26.8	—	—	—	—	11,635.2	29.1	2,695.2	7,776.4	1,163.5
Subtotal (B)	9,025.0	57.4	6,359.4	40.4	101.3	0.6	249.8	1.6	15,735.5	39.3	5,138.5	9,052.6	1,544.4
C. Agricultural Enterprise Development	—	-	10,100.0	76.9	—	—	3,041.0	23.1	13,141.0	32.9	10,100.0	2,836.9	204.1
D. Project Management	293.5	15.1	1,655.7	84.9	—	—	—	—	1,949.1	4.9	748.6	1,007.0	193.6
Total Project Costs	10,607.9	30.1	21,222.2	60.3	101.3	0.3	3,290.9	9.3	35,222.3	88.1	18,610.8	14,267.3	2,344.1
Interest During Construction	—	—	4,417.0	100.0	—	—	—	—	4,417.0	11.0	—	—	—
Commitment Fee	—	—	230.7	100.0	—	—	—	—	230.7	0.6	—	—	—
Front-End Fee	—	—	130.0	100.0	—	—	—	—	130.0	0.3	—	—	—
Total Disbursement	10,607.9	26.5	26,000.0	65.0	101.3	0.3	3,290.9	8.2	40,000.0	100.0	18,610.8	14,267.3	2,344.1

— = not available, ADB = Asian Development Bank.
Source: Asian Development Bank estimates.

IMPLEMENTATION ARRANGEMENTS AND FUND FLOW

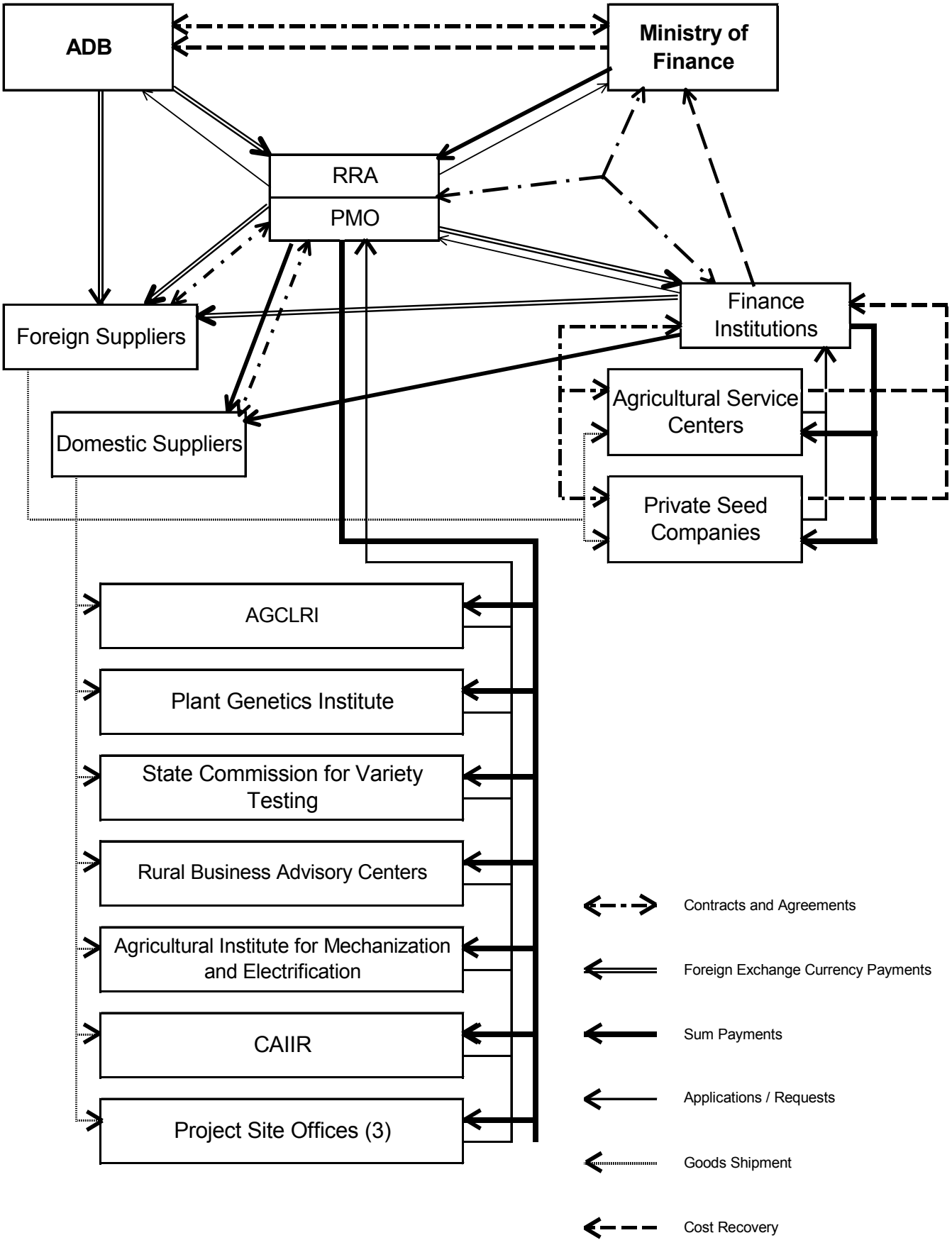
Figure A5.1: Project Implementation Arrangements



———— = guidance and supervision

═══════ = commercial relation

Figure A5.2: Fund Flow



ADB = Asian Development Bank, AGCLRI = Andijan/Galla Aral Cereals and Legumes Research Institute, CAIIR = Central Asian Institute for Irrigation Research, PMO = Project Management Office, RRA = Rural Restructuring Agency.

INDICATIVE CONTRACT PACKAGES

Component/Package	Estimated Value ($'000)	Type of Contract
A. Varietal Development and Testing		
1. Laboratory/Office Repairs and Trial Plots (civil works)	121	LCB
2. Field Research Equipment (trial plots)	1,953	ICB
3. Farm Equipment	669	ICB
4. Office Furniture	50	DP/IS
5. Computers and Communication	42	DP/IS
6. Vehicles	385	IS
7. Farm, Laboratory, and Office Supplies	1,473	DP/IS
8. Breeding Material/Foundation Seed Purchase	230	DP
B. Enhanced Farm Management		
1. Demonstration Plot Construction	183	LCB
2. Pest-Monitoring Equipment	244	DP/IS
3. Farm Equipment (laser levelling, direct seeding, others)	1,185	ICB
4. Irrigation O&M Equipment	3,087	ICB
5. Office Furniture	78	DP/IS
6. Computers	82	IS
7. Communication and Software for Pest Monitoring	21	DP
8. Vehicles	146	IS
9. Farm and Office Supplies	542	DP/IS
10. Printing of Information Materials	128	DP/IS
C. Project Management		
1. Office Refurbishment (PMO and PSO)	157	LCB
2. Office Furniture	78	DP/IS
3. Computers and Communication	30	IS
4. Vehicles	48	IS
5. Office Supplies	141	DP/IS

DP = direct purchase, FA = force account, ICB = international competitive bidding, IS = international shopping, LCB = local competitive bidding, O&M = operation and maintenance, PMO = Project Management Office, PSO = Project Site Office.

Note: The list excludes farm machinery and seed-cleaning equipment to be procured by private agricultural service centers and seed companies, valued at $11.1 million (including taxes). The private sector will procure for the equipment in a cost-effective manner following the *Guildelines for Procurement under Asian Development Bank Loans.*

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Introduction

1. The Project will require 31 person-months of international and 42 person-months of domestic consulting services. The consultants will help the Rural Restructuring Agency (RRA) and Ministry of Agriculture and Water Resources (MAWR) administer the Project, evaluate project impacts, strengthen quality control of wheat breeding, build sustainable extension and irrigation institutional arrangements, and select participating financial institutions (PFIs) to channel project subloans. Capacity Building through Consultant inputs will complement the specialized training program to be provided to research institutions under the Project. The list of consultants to be engaged and financed by the loan is in Table A7.

Table A7: Consulting Service Requirements

Expertise	Person-Months
A. International Consultants	
1. Project Management Adviser/Team Leader	15
2. Monitoring and Evaluation Expert	4
3. Plant Breeder and Varietal Testing Expert	5
4. Institution Development Specialist (extension and irrigation)	6
5. Banking Expert	1
Subtotal	**31**
B. Domestic Consultants	
1. Extension Specialist	16
2. Water Users' Association Organizers	18
3. Monitoring and Evaluation Specialist/Sociologist	6
4. Banking Specialist	2
Subtotal	**42**
Total	**73**

Source: Government and Asian Development Bank estimates.

2. Except for the banking experts, the consultants will be engaged through an international consulting firm in association with a domestic firm. The quality-and cost-based selection method will be used in engaging the consulting firm. The banking experts will be engaged through individual contracts because of their distinct tasks and limited person-month inputs. The consultants will work closely with RRA and MAWR staff and interact frequently with the project beneficiaries, particularly on proposed interventions on the farms, such as varietal testing, wheat breeding, and demonstration plots. The consultants may be required to perform tasks other than those specified in the outline terms of reference, determined as necessary by the project management office (PMO) to comply with project requirements. Specific terms of reference of the international consultants are as follow:

B. International Consultants

1. Project Management Adviser (15 person-months)

3. The consultant will help PMO staff in all aspects of project implementation management: activity coordination, procurement, progress and annual report preparation, and on-the-job training to PMO staff. The specialist will conduct the following tasks:

(i) Help the PMO manager coordinate all project implementation matters with relevant ministries (Cabinet of Ministers, MAWR, Ministry of Economy, Ministry of Finance [MOF], and others); project site office (PSO); involved institutes; international consultants; local administration; ADB; and any other organization associated with project implementation.

(ii) Provide project staff with on-the-job training in ADB guidelines and procedures, and project management, and scheduling techniques.

(iii) Help the project manager program project activities, estimate financial requirements for these activities, and facilitate the release of adequate funds on time.

(iv) Help the project manager ensure that the accounting standards for the Project meet ADB requirements and that the withdrawal applications sent to ADB are complete and are sent on time.

(v) Help the PSO ensure that all periodic reports are prepared systematically and submitted on time, and reflect the real picture of project implementation; that major project implementation issues are brought to the attention of the concerned parties; and that necessary remedial measures are implemented.

(vi) Familiarize the PMO staff with project procurement requirements, including those specific to the ADB guidelines. Develop the contracting capacity of the RRA by providing on-the-job training. Based on project procurement requirements, prepare detailed procurement plans and packages and determine realistic schedules for procurement.

(vii) Help prepare bidding documents, and advise on the application of procedures and requirements related to bid opening, evaluation, and award of contracts, with particular attention to the time allowance to prepare bids, bid opening procedures, circumstances related to clarifications or alterations of bids, confidentiality, examination of bids, evaluation and comparison of bids, and applicable domestic preferences.

(viii) Help the PMO formulate and interpret contract provisions and settle disputes with contractors.

(ix) Establish a procurement monitoring system in the PMO to allow collection and recording of procurement data for (a) timely information flow, submission, and approval of terms of reference, shortlists, and other requirements; (b) tracking all

necessary and critical procurement actions and activities, including advertising, bidding, contract award, and completion time for individual contracts; (c) prompt reporting of contract award information by the RRA to ADB; and (d) preparation of quarterly reports to ADB.

(x) Develop a contract management system to ensure that records and data are stored systematically and cross-referenced with project financial accounts.

2. Monitoring and Evaluation Expert (4 person-months)

4. The consultant will have a background in social sciences and economics and help the PMO develop a project monitoring and evaluation system that conforms with ADB's requirements and is compatible with, or will improve, the Government's system so that impact monitoring continues to be effective after project completion. Project impact evaluation should focus on the appropriate design of baseline, midterm, and project completion surveys, including impacts of agricultural policy reforms on household standards of living as well as government budgetary resources. The consultant will train PMO staff in the monitoring and evaluation unit to regularly monitor project activities.

3. Plant Breeder and Varietal Testing Expert (5 person-months)

5. To advise and train local staff, the international consultant should have substantiated experience in wheat-breeding techniques, field-testing and the equipment required, statistical analysis of monitoring data, and reporting of conclusions and recommendations. Experience in testing by disease inoculation under controlled conditions will be useful. Of particular importance will be the objective assessment (by statistical technique) of the robustness of new cultivars to field conditions of limited crop inputs, drought, soil salinity and prevalence and mutation of pests and diseases. The specific tasks are as follows:

(i) Review the status of the wheat breeding and varietal testing program, and scope and methodology of varietal testing and selection.

(ii) Consult the State Commission for Varietal Testing (SCVT) to identify key challenges and actions needed to upgrade the standards of crop variety testing, particularly for wheat.

(iii) With the Andijan and Galla-Aral Cereal and Legumes Research Institute (AGCLRI), identify the key challenges and actions needed to upgrade the standards of wheat and dry-land legume breeding.

(iv) Prepare detailed specifications of equipment to be procured, and formulate a suitable training program for SCVT and AGCLRI. Provide technical support to the PMO during the procurement, supply, and installation of equipment for breeding, field testing, and monitoring.

(v) Through on-the-job training help SCVT upgrade practices and standards for varietal testing.

(vi) Monitor progress of breeding, selection, and propagation programs.

(vii) Advise AGCLRI, SCVT, the State Committee on Seed Quality Control and Certification and the Government to establish legislative actions and mechanisms needed to improve cost recovery to better sustain the production of foundation (super elite) seeds.

4. Institution Development Specialist (6 person-months)

6. The consultant will be an agricultural expert with extensive experience in conducting applied and demand-oriented technology demonstrations, and conducting participatory consultations to (i) promote active participation and equity contribution in new technology demonstration, and (ii) ensure farmers' full consent and understanding when entering into contracts with the Project to repair onfarm irrigation and drainage facilities. The specialist will do the following:

(i) Help the Association of Dehkan and Private Farmers (ADPF) and rural business advisory centers (RBACs) in three project districts identify suitable locations to demonstrate the cultivation of improved wheat varieties, alternative crop rotation, and improved farm soil and water management techniques. The demonstrations will use an "adaptive" approach taking into consideration farmers' interest and inputs, and resource constraints at the farm level.

(ii) Identify materials and resources required to effectively establish and conduct onfarm demonstrations. Arrange cooperation (institutional and logistical) arrangements between farmers, local governments, RBACs, and research institutes to ensure sustainable and cost-effective operations of the demonstration plots.

(iii) Prepare a detailed program to prepare extension materials/pamphlets for distribution to farmers. Identify contributors and write specifications for information materials to ensure that they are suitable for farmers and extension officers.

(iv) Review, and help formulate, the staff training program for RBACs ADPF, and farmers, and help organize the training program.

(v) Provide technical support to the PMO during procurement of materials and equipment to strengthen field demonstrations.

(vi) Help individual farmers, PMO, and MAWR's District Agriculture and Water Departments negotiate contracts for repairs of onfarm irrigation and drainage facilities. Help firm up the mechanism and schedule of repairs, cost recovery terms, and method of financing and repayment collection agreeable to all concerned parties.

5. Banking Expert (1 person-month)

7. The consultant will have a background in finance and familiarity with the banking and finance sector and institutions in Uzbekistan. The consultant will help the PMO assess the financial suitability of commercial financial institutions, including banks and leasing firms, to channel subsidiary loans under the Project's Agricultural Enterprise Development component. The consultant will need to refine the initial criteria and mechanism for selecting project PFIs.

The consultant will help PMO and MOF negotiate and finalize subsidiary loan agreements with two suitable PFIs under the Project and draft credit guidelines for onlending arrangements and terms between PFIs and private subborrowers.

C. Domestic Consultants

1. Extension Specialist (16 person-months)

8. The consultant should have qualification in agricultural science, with extensive experience in conducting onfarm demonstrations and, preferably, participatory consultations to assess farmers' needs and promote their active participation and contribution in extension activities. The consultant will help institutional development experts carry out their tasks, including (i) training RBAC and ADPF staff; (ii) conducting surveys and consultations with farmers; and (iii) strengthening collaboration between the international expert and PMO, RRA, and other concerned government agencies.

2. Water Users Association Organizers (18 person-months)

9. The consultants will have qualification in irrigation management and agricultural science, with extensive experience in forming, and helping in operations of, independent water users' associations (WUAs), particularly under internationally funded projects. The consultants will help farmers in three pilot districts understand the purpose and benefits of a WUA and be aware of legal and resource requirements to form one. The consultants will provide initial training and directions to WUA members to operate and maintain irrigation facilities.

3. Monitoring and Evaluation Specialist (6 person-months)

10. The consultant will have a background in social sciences and/or economics. The consultant should have experience in conducting social and economic surveys and household-level data collection. The consultant will help the international monitoring and evaluation expert carry out his or her tasks, particularly collecting data; monitoring field surveys; and consulting and strengthening collaboration between the international consultant and PMO, RRA, and other concerned agencies.

4. Banking Specialist (2 person-months)

11. The consultant will have a background in finance, familiarity with the banking and finance sector institutions in Uzbekistan and their performance over time, and substantial experience in evaluating the financial health and analyzing financial indicators of finance institutions in the country. The consultant will help the international banking expert carry out his or her tasks, particularly data collection; data analysis; and consultations between the international consultant and PMO, RRA, MOF, and other concerned agencies. The consultant will also help PMO and MOF draft credit guidelines for onlending between PFIs and private subborrowers.

TECHNICAL ASSISTANCE FOR FURTHERING REFORMS IN THE GRAIN SECTOR

A. Objectives and Scope

1. The technical assistance (TA) aims to advance the transformation of Uzbekistan's agricultural policies, particularly in the grain sector, toward the market system. TA activities will cover two components. The first will facilitate private sector investment in agriculture and be implemented in the districts of Kuyi-Chirchik (Tashkent province), Zamin (Djizak), and Katakurgan (Samarkand), which will benefit from the planned reduction of state involvement in wheat seed production, farm input supply, provision of machinery rental, and agroprocessing. The second component will help policymakers, particularly in the Ministry of Agriculture and Water Resources (MAWR), Ministry of Finance (MOF), and Ministry of Economy (MOE), to evaluate wheat policies to (i) stabilize wheat prices, which vary due to the introduction of market mechanisms in the subsector; (ii) identify options to secure wheat supply to the population, which will be less costly than the present wheat self-sufficiency program; and (iii) ensure equitable sharing of the costs of the grain security program.

2. Envisaged outputs of the TA are (i) realistic and viable business plans by potential investors for investments in agro-enterprises in the three pilot districts, for credit consideration by commercial finance institutions; (ii) greater understanding of local and central governments of the positive role of private sector in agriculture; (iii) greater awareness among policy makers of market mechanisms available to stabilize grain prices and production; and (iv) an action plan for the Government to improve grain sector policies.

B. Consultants

3. The TA will provide a total of 12 person-months of international consultant input from one business planning expert-team leader (6 person-months), one agro-consulting management specialist (2), and one grain policy expert (4); a total of 15 person-months of domestic consultant input will also be provided from one financial analyst (6), one legal expert (3), and one business management advisor (6). Except for the international grain policy expert, all international and domestic inputs will be allocated for the first TA component, for which the Asian Development Bank (ADB) will select and engage a firm of international consultants with domestic associates to provide services in accordance with the terms of reference in Section C (Description of Tasks). The quality- and cost-based selection method and simplified technical proposal format will be used. For the second component, a qualified grain policy expert will be engaged through an individual consultant contract, following ADB's *Guidelines on the Use of Consultants*. The consultants will procure equipment in accordance with ADB's *Guidelines for Procurement*.

C. Description of Tasks

4. The TA consultants will work closely with staff of MAWR, MOE, MOF, rural business advisory centers (RBACs), project management office (PMO), project site offices (PSOs), as well as project beneficiaries and local governments. The consultants will accomplish the following tasks:

1. Support for Private Agro-Enterprises

a. Business Plan Preparation

5. The consultant will help form agricultural service centers (ASCs)—private companies that will provide machinery hire, input retailing, transport, and/or agroprocessing services to farmers; and private seed-producing companies. The specialist's specific tasks will be as follows:

(i) In collaboration with the Rural Restructuring Agency (RRA), MAWR, and local governments, disseminate information in business communities within Uzbekistan of investment opportunities in ASCs and seed companies in the districts of Kuyi-Chirchik, Zamin, and Katakurgan.

(ii) In collaboration with the Government and ADB, screen and identify potential investors or consortiums of investors for the pilot districts. A minimum of three potential ASC investors are to be identified, one for each district. A minimum of two investors should be identified for seed production. Selection of potential investors to be assisted by the TA should be based on, among other things, the initial business strategy, quality of equity contribution and collateral for commercial borrowing, and experience in proposed business activities.

(iii) Following selection of potential private sector investors, provide advisory assistance to refine business strategies and plans, which should be prepared by the applicants. This process should include an assessment of market demand for seeds and different types of farm services and processed commodities.

(iv) Help investors negotiate to secure operating and capital investment credit from commercial finance institutions.

(v) Help the central and local governments monitor and regulate activities of private enterprises established in the pilot districts. Inform key decision makers of the positive roles of the private sector in developing the rural agricultural economy.

(vi) Identify policy and institutional issues (e.g., business licensing, taxation, inspection) that may impede investment in agricultural enterprises and recommend actions and policy reforms needed to address the issues.

(vii) Develop a mechanism (e.g., transparent model contracts) to improve fair contractual arrangements between enterprises and farmers and promote competition among the enterprises.

(viii) Help ASCs and seed entrepreneurs established under the Project implement management accounting and information systems to allow businesses to operate on a sustainable basis, and to allow effective financial monitoring by creditors.

(ix) Through seminars and presentations disseminate the lessons learned from promotion of private investments in the pilot districts. Prepare booklets, brochures, and training materials for the education and information dissemination campaign.

(x) In collaboration with the State Committee for National Property develop a time-bound action plan and mechanism to privatize the machine tractor parks and agricultural supply stores in the project districts.

b. Strengthening Rural Business Advisory Centers

6. The TA will also provide institutional support to RBACs in the focus districts to develop their business strategies and operational management systems, and strengthen their staff skills:

(i) Review the experience and lessons learned from operations of RBACs in other districts under the Ak Altin Agricultural Development Project and Rural Enterprise Support Project.

(ii) Based on feedback of their potential clients (private farmers and enterprises), help RBACs in the pilot districts develop business strategies, particularly to identify specific consulting services that can be provided on a full cost-recovery basis.

(iii) Identify services that RBACs need to provide as public services. Formulate financing mechanisms such as government management service contracts to support RBAC operations in a sustainable manner.

(iv) Help private and dekhan farms associations recruit qualified staff for RBACs and formulate work programs, including operational systems, procedures, and staff development plans.

(v) Study ongoing farm restructuring in the project area. Identify problems, analyze underlying factors, and propose measures for improvement. Identify the role of RBACs in facilitating farm restructuring.

(vi) Analyze training needs and develop training materials for RBAC staff, which may cover agricultural enterprise formation, farm management, marketing, enterprise financial management, business transaction and contracting, debt structuring, accounting and record keeping, reorganization and legal implications, as well as microenterprise establishment and related technologies, with particular attention to addressing women's needs.

(vii) Provide training and hands-on coaching to RBAC staff on the conduct of training courses and provision of advisory services.

(viii) Help RBACs use the pilot demonstration plots established under the Project to promote adoption of new technologies.

(ix) Help RBACs develop an information campaign to raise farmers' awareness of their rights and responsibilities in project implementation, with particular attention to promoting women's participation in the program. Develop training materials for the campaign program, and train PMO, PSO, and RBAC staff to conduct the information campaign.

(x) Help PMO and PSO establish the district consultation committee, by which project beneficiaries will monitor implementation. Develop the mandate, procedure, and operational systems for the committee. Facilitate the election of

beneficiary representatives in the committee and help in its early operations, with particular attention to representation of women and their active role in project monitoring.

2. Grain Policy Review

(i) Help MOE review the food security strategy and food grain production policies.

(ii) Evaluate the costs to the economy of achieving grain self-sufficiency. Identify policy options to ensure that the costs of national food security can be equitably shouldered by policy beneficiaries.

(iii) Help MOE and MAWR explore how the Government can adopt a market-oriented mechanism to improve efficiency and lower the costs to assure stable aggregate grain production and wheat prices. Mechanisms for consideration include establishing efficient grain stockpiling and strategic reserve system, rolling future contracts, price incentives/producers' subsidies, and improved output forecasting combined with importation strategy.

(iv) Help the Cabinet of Ministers and MOE evaluate the policies and regulations affecting exports, importation, and marketing of agrochemical and fertilizers to liberalize volume and price restrictions.

D. Implementation Arrangements

7. RRA will be the Executing Agency for the TA. A deputy director general of RRA, who will be the project director, will supervise overall TA implementation. A TA working group, comprising technical staff of RRA, MAWR, MOE, MOF, Association of Dekhan and Private Farmers, and other concerned agencies will be formed to implement the TA. RBACs will provide up to nine counterpart staff to work with the consultants.

E. Implementation Schedule, Reports, and Documents

8. The TA will be undertaken over 10 months, starting from the second quarter of 2004. The consultants will submit to RRA and ADB an inception report in the middle of the second month, brief progress reports in the middle of the fourth and eighth months, a midterm report at the middle of the sixth month, a comprehensive draft final report at the end of the tenth month, and a final report by the end of TA implementation.

F. Estimated Costs

9. The total cost of the TA is estimated at $600,000 equivalent, of which $400,000 equivalent will be provided by ADB on a grant basis. The grant will be provided from the Japan Special Fund, financed by the Government of Japan. The remaining $200,000 equivalent will be financed by the Government through in-kind contributions. The estimated breakdown of the costs is given in Table A8.

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

Item	Foreign Exchange	Local Currency	Total Cost
A. Asian Development Bank (ADB) Financing[a]			
1. Consultants			
a. Remuneration and Per Diem			
i. International Consultants	218	0	218
ii. Domestic Consultants	0	47	47
b. International and Local Travel	25	1	26
c. Reports and Communications	5	6	11
2. Equipment and Supplies[b]	12	0	12
3. Workshops/Seminars	0	15	15
4. Interpreters and Translators	0	7	7
5. Land Transport and Administrative Support	0	8	8
6. Representative for Contract Negotiations	5	0	5
7. Contingencies	39	12	51
Subtotal (A)[c]	**304**	**96**	**400**
B. Government Financing			
1. Office Accommodation	0	12	12
2. Remuneration of Counterpart Staff	0	54	54
3. Travel and Per Diem of Counterpart Staff	0	20	20
4. Survey and Data	0	13	13
5. Workshops and Seminars	0	15	15
6. Information Campaign Program	0	20	20
7. Logistical Support at Oblasts/Districts	0	40	40
8. Contingencies	0	26	26
Subtotal (B)	**0**	**200**	**200**
Total	**304**	**296**	**600**

[a] Financed by the Japan Special Fund, funded by the Government of Japan.
[b] Purchase of computer systems and printers, accessories, and facsimile and photocopy machines.
[c] The amount of $106,000 should be set aside for engagement of a grain policy expert (including two round-trip international travel; local travel; one computer and printer; and allowances for workshops, communications, translation, report production).
Source: Asian Development Bank estimates.

FINANCIAL AND ECONOMIC ANALYSES

A. Policy Environment

1. Financial and economic analyses have been carried out to assess the attractiveness of wheat cultivation in Uzbekistan and the sustainability of the project investments under the current and future—-more liberalized—-market environments. The current financial regime assumed continuing implementation of agricultural policies as of 2003, including adjustment of state procurement prices for wheat to international prices and abolition of state control of cropping pattern at the farm level. The financial analysis also assumed the adoption of reduced procurement quotas for wheat and wheat seed as outlined in the project assurances. For the crop budget analysis, as of October 2002 the state procurement prices for wheat and cotton were estimated at 30% and 52% below their economic parity prices, respectively, while traded agrochemicals are 27–35% below their economic prices. The divergence between the financial and economic prices has been derived mainly from the estimated divergence of the official and market exchange rates. A shadow exchange rate factor of 1.3 was used.[1] Wheat seed prices are calculated at 50–200% over the commercial grain prices, depending on genetic purity. Local market prices for wheat, for above-quota sales by farmers, were estimated at 20% over the state procurement prices as in 2001–2002. Liberalized policy environment assumes the convergence of financial prices toward economic prices and termination of the procurement quota system.

B. Comparative Analysis on Wheat Production

2. To assess the attractiveness of wheat cultivation under the current and liberalized policy environments, financial and economic gross profits of 11 crops grown in Central Asia, including wheat, have been estimated. Sustainable crop rotation schemes were also considered for crops in three main cultivation areas: well-irrigated, irrigation-deficit (Glossary), and rain-fed areas. The assessment showed that wheat on average generates positive farm incomes in the three growing areas (Table A9.1). In the irrigation-deficit area, wheat provides the highest financial and economic returns among the crops evaluated. In the rain-fed system, crops with limited demand, such as chickpeas, sesame, and safflower provide higher return than wheat. Due to their drought tolerance, chickpeas and safflower can be grown in rotation with wheat to maximize and stabilize farm incomes. On well-irrigated land, wheat generates less income than cotton; vegetables (potatoes, tomatoes, and onions); wheat seed; and fodder crops. Depending on farmers' preference, irrigated wheat can be grown in rotation with cotton, but this rotation cannot be sustained for many years as it will result in the deterioration of soil and yields of both crops. Overall the assessment concluded that wheat is a financially and economically an attractive crop, particularly for irrigation-deficit and rain-fed areas.[2] Households with backyard plots and private farms with good irrigation also cultivate wheat for food security and income stabilization.

C. Financial Analysis

1. Financial Analysis at Farm Level

3. In Kuyi Chirchik, Zamin, and Katakurgan districts, irrigated wheat areas in 2002 were 13,455, 14,551 and 8,874 hectares (ha), respectively. No rain-fed wheat is grown in Kuyi

[1] The price divergence on cotton is higher due to additional value added tax on cotton ginning (processing).
[2] Estimated size of irrigation-deficit areas in each oblast is in Supplementary Appendix B.

Chirchik, while rain-fed wheat in Zamin and Katakurgan covered 6,100 and 2,800 ha, respectively. The area planted to wheat in the five project oblasts of Djizak, Kashkadarya, Samarkand, Syrdarya, and Tashkent totaled 852,700 ha. In the oblasts, wheat production from irrigated areas (excluding backyard plots) was 1.40 million tons (t) from 559,700 ha, or 2.42 t/ha, and under rain-fed conditions, 175,800 t from 293,000 ha, or 0.6 t/ha.

Table A9.1: Financial and Economic Crop Gross Margins
(constant 2002 prices)

Crop	Growing Area	Irrigation Requirement ('000 m^3)	Gross Margins per Hectare	
			Financial (SUM)	Economic (SUM)
Wheat	Rain-fed	NA	44,437	21,930
Chickpea	Rain-fed	NA	60,080	44,079
Sesame	Rain-fed	NA	162,427	124,118
Safflower	Rain-fed	NA	53,135	(18,991)
Alfalfa	Rain-fed	NA	19,012	(21,396)
Cotton	ID	3.5	(27,426)	(38,293)
Wheat	ID/WI	2.5	220,550	273,048
Grain Maize	ID/WI	2.5	170,323	519,777
Forage Maize	ID/WI	1.5	202,012	(5,179)
Wheat Seed	WI	2.5	578,850	998,848
Cotton	WI	3.5	266,283	510,122
Alfalfa	WI	4.0	404,297	240,675
Potatoes	WI	5.0	1,362,416	583,096
Tomatoes	WI	8.0	767,226	634,729
Onions	WI	10.2	1,627,426	1,588,850

ID = irrigation deficit, m^3 = cubic meters, NA = not applicable, WI = well irrigated.
Source: Asian Development Bank (ADB) estimates.

4. Farm structures considered from the financial analysis differ markedly. Farm models have been prepared to represent small and large private farm operations under rain-fed and irrigated conditions. Representative small and large rain-fed farms are 100 and 1,000 ha in size, respectively. Small and large irrigated farms are 10 and 300 ha, respectively.

5. For the financial analysis the following were assumed, irrespective of farm size: (i) with project interventions, wheat yields will increase linearly to expected full development levels over 10 years; (ii) besides annual crops, farms grow horticultural crops on 0.25 ha for small rain-fed farms and 1.00 ha for large irrigated farms; (iii) fixed costs (electricity, building maintenance, taxes, and insurance) are part of farm costs. The costs of production credit have been built into the crop budgets as part of the variable costs.

6. Under rain-fed conditions, adoption of improved and sustainable cropping systems (a rotation of wheat and chickpea), coupled with better availability of fertilizers and progressive introduction of minimum tillage techniques, will increase average wheat yield from 0.6 t/ha to 1.4 t/ha in 10 years (see Table A9.5). In the irrigation deficit areas, the rotation of wheat and cotton, which is recognized as unsustainable, will be replaced by a rotation of wheat, alfalfa, and cotton.[3] Introduction of suitable wheat varieties and improved crop rotation is projected to increase wheat yield from 2.4 t/ha to 4.6 t/ha in a decade. This assumption is conservative because incremental yield increase observed in selected farms have been higher.

[3] Cotton will occupy 20% of the modeled farm area, which will receive adequate irrigation.

7. Details of farm returns for 11 crops are in Supplementary Appendix F. The farm analysis indicates that under rain-fed and irrigation-deficit conditions, farms devoting 71% of their area to wheat will realize substantial profit improvements. For the representative 100 ha rain-fed farm, net income will increase from SUM18,940 ($19) to SUM48,830 ($50) per ha in project year 10. For a smaller irrigation-deficit farm with 10 ha, farm income will rise from SUM100,300 ($102) to SUM350,700 ($360) per ha in a decade. Similarly, for a well-irrigated farm with 10 ha, incomes are projected to rise from SUM204,750 ($210) to SUM357,000 ($365) per ha.

8. The farms' gross margin increases took account of adjustments in seed price and are adequate to cover costs of cultivation and harvesting services to be provided through the proposed agricultural service centers (ASC) in the focus districts. Similarly, recovery of royalty payments on super-elite seed, sale of certified seeds, and recovery of costs for extension materials are all considered affordable.

2. Financial Analysis of Agricultural Service Centers

9. ASCs will be established to provide competitively priced services to private farmers cultivating wheat as part of their crop rotation. ASCs are expected to provide a broad range of services, including agricultural machinery hire; workshop repair services; input supply; small processing facilities (e.g., grain milling, oilseed expelling); and transportation services. ASCs will be fully privately owned with equity held by entrepreneurs, farmers, foreign joint ventures, or a combination of such investors. Subloans to approved borrowers will pass from the Ministry of Finance through an approved participating financial institution. Criteria for eligible ASCs are in Appendix 3. Assuming diversification of business activities, the model of the pilot ASC analyzed for the Project was based on an initial total investment of $3.75 million. ASCs, however, can start as smaller units that will expand as profits accumulate.

10. The analysis of individual service shows that ASCs can provide equipment rental at rates comparable with those charged by state-owned Machine and Tractor Parks. The model estimated that the ASC will purchase agricultural machinery and equipment for $1.65 million equivalent. The equipment rental service will be complemented by equipment repair services, retails of seeds, fertilizer, and pesticides, small-scale oilseed processing and flour milling, and transport services.

11. Financial modeling of the pilot ACS has been conducted for a 25-year period for the discounted cash-flow analysis; and for 15 years for financial projections (i.e., balance sheets, income statements, and source and application of funds statements. The cash flow analysis showed that investment in ASC has a financial internal rate of return of 27.5% and projected net present value of $2.92 million. Table A9.2 provides the discounted cash flow analysis results. The table also indicates the robustness of the ASC model. Even when the total cost stream increases by 10% and the revenue stream declines by 10%, the internal rate of return is still 18.71%.

12. The ASC model was also tested in terms of its performance and creditworthiness ratios. The preparation of financial projections (loan repayment schedule, balance sheets, income statements, retained earnings statement, source and use of funds statement) for a 15-year period illustrates ASC's ability to repay a $3.0 million subloan over a 10-year period with a 3-year grace on principal repayments. The analysis showed that ASC will satisfy the criteria established for subloans under the project. The ASC financial projections are in Table A9.3.

Table A9.2: Discounted Cash Flow Analysis of Agricultural Service Center

Base Case and Sensitivity Analysis	FIRR (%)	NPV (SUM million)
Base Case	27.53	2846.03
Sensitivity Analysis:		
Revenue Decreased by 10%	22.36	1900.28
Capital Costs Increased by 10%	23.96	2410.20
Recurrent Costs Increased by 10%	26.24	2618.85
Capital and Recurrent Costs +10%, Revenue –10%	18.71	1239.23
Capital and Recurrent Costs –10%, Revenue +10%	39.60	4452.83

FIRR = financial internal rate of return, NPV = net present value.
Source: Asian Development Bank estimates.

Table A9.3: Estimated Agricultural Service Center Performance Ratios

Ratio	Project Year				
	1	4[a]	10[b]	11	15
Performance Ratios:					
Return on Net Assets (%)	28.45	25.11	17.50	17.44	14.21
Gross Profit Margin (%)	70.48	76.39	77.58	77.66	77.66
Operating Ratio (%)	29.52	23.61	22.42	22.34	22.34
Return on Sales (%)	17.04	20.78	32.54	34.24	34.24
Return on Equity (%)	18.49	16.32	11.37	11.33	9.24
Return on Assets (%)	9.37	14.74	18.00	17.12	14.00
Debt Service Coverage Ratio	5.44	1.25	1.71	—	—
Creditworthiness Ratios:					
Current Ratio	7.98	25.68	37.25	32.16	52.55
Debt-Equity Ratio	3.3:1.0	1.6:1.0	0.0:1.0	0.0:1.0	0.0:1.0

— = not available.
[a] First year of loan principal repayments.
[b] Last year of loan principal repayments.

3. Financial Analysis of Seed Companies

13. The project supports the establishment of private companies for the production of rain-fed and irrigated wheat seed. These companies would organize the growing and processing of super-elite, elite and other certified wheat seed for sale to the State or private farmers. Discounted cash flow analysis was undertaken for two models; representing wheat seed production under irrigated and rain-fed conditions. Both models assume the purchase of new seed processing units with an hourly capacity of 2.5 tons for installation within an existing building. Other investment costs are for farm machinery purchases.

14. In the case of the irrigated wheat seed company, it is estimated that an investment of $720,000 will be required. Seeds will be grown on rented land totaling 400 ha. The company is expected to process 2,700 tons of seeds each year with 1,800 tons originating from its rented

land and balance supplied by other growers under contract. In the case of the rain-fed model, the nucleus farm would total 200 ha, 71.4% of which is planted to wheat each year. Another 200 ha of wheat land is rented. A total of 2,700 tons of seed will be processed each year with 550 tons originating from own and rented land and the balance to be supplied under contract.

15. Investments in the irrigated and rain-fed wheat seed companies is projected to yield FIRRs of 34.3% and 20.8%, respectively, with NPVs of $666,100 and $97,970.

D. Economic Analysis

1. Assumptions

16. The economic analysis has been carried out using the domestic price numeraire approach. Adjustments were made to remove transfer charges (i.e., taxes, duties, and interest charges) and to account for a shadow exchange rate factor (SERF) of 1.30 applied to prices of traded goods. In view of the substantial unemployment and under employment in the rural areas, an average shadow wage rate of 0.8 was also introduced. The economic analysis was conducted over a 25-year period in 2002 constant prices. The economic farm gate prices of wheat were derived on an import parity basis, using Kazakhstan as location of the main wheat source in the region and Russia as the dominant wheat importer/consumer.

2. Economic Benefits

17. Incremental benefits of the Project were derived from two key components, namely the estimated increase in farm income per hectare and the potential expansion of wheat cultivation area arising from the project interventions. The increase in per hectare farm income is expected to come from the envisaged increase in wheat yields as well as improved farm efficiency in input utilization. The gains in farm efficiency will, in turn, come from more timely supply of production inputs and machineries, availability of better wheat varieties, and greater awareness of farmers of improved soil and water management practices. Further, introduction of drought resistant wheat varieties and alternative crop rotation schemes will also allow sustainable farming on the rain-fed and irrigation deficit areas.

18. As the national concern over food security eases and wheat yield per hectare rises, wheat growing area under irrigated conditions is expected to decline. To further improve income, farmers would allocate more irrigated lands to higher value crops such as cotton, fruits, and seeds. Although such a shift in cropping pattern will be made possible only by the Project's technical and policy assistance, the benefits of the change in cropping pattern had not been accounted for in the economic analysis. Therefore, the project benefits have been conservatively estimated.

19. Seven representative farm production models were used for the project analysis. Two for irrigated and rain-fed areas that do not receive project assistance (without-project scenarios). Five for farms benefiting from the Project assistance (with-project scenarios). Among the five with-project models, three are for irrigated conditions, for farms adopting (i) improved seeds, (ii) improved seeds and agronomic practices, and (iii) improved seeds, agronomic practices, and land leveling technology. Two models are for rain-fed farms adopting (i) improved seeds and agronomic practices and (ii) improved seeds, agronomic practices, and direct seed drilling technology.

3. Impact Area

20. The estimated rates of adoption of new technologies for the five with-project production scenarios vary. On both irrigated and rain-fed areas, it has been conservatively assumed that adoption of the new technologies will begin in project year three. To simulate the expansion of the project impact area, a two-weighting system was adopted. The first set of weights comprised percentages of the wheat cultivation area that will participate or adopt the technologies to be introduced under the Project. The second weights estimate the proportions of participating area adopting three different production models, outlined in Section 4. Table A9.4 summarizes the build up in the area expected to participate in the Project. The speed at which the participating (project impact) area expands depends mainly on the estimated dissemination of technology through the State and private extension services and availability of improved seeds. Given that the total potential wheat growing areas in the five project oblasts of 560,000 and 330,000 ha., respectively, for irrigated and rain-fed wheat, the slow rates of expansion in impact areas shown in Table A9.4 are considered conservative.

Table A9.4: Participating Areas (ha)

Area	Project Year			
	3	5	10	25
Irrigated Wheat	**29,300**	**107,800**	**273,796**	**273,796**
Kuyi-Chirchik District	3,500	7,500	13,350	13,350
Zamin District	3,500	7,500	14,720	14,720
Katakurgan District	2,500	5,500	8,962	8,962
Tashkent Oblast	4,300	16,800	46,075	46,075
Djizak Oblast	3,450	13,450	37,480	37,480
Samarkand Oblast	4,300	16,800	46,890	46,890
Syrdariya Oblast	4,300	16,800	45,519	45,519
Kashkadariya Oblast	3,450	23,450	60,800	60,800
Rain-fed Wheat	**5,000**	**35,000**	**293,000**	**329,966**
Total	**34,300**	**142,800**	**566,796**	**603,762**

Source: Ministry of Agriculture and Water Resources and Asian Development Bank estimates.

4. Average Yields

21. As noted in para. 20, within the participating area, yields are expected to improve as progress is made in the adoption of technologies. This will be reflected in the envisaged improvement in wheat yields as shown in Table A9.5. The projected average irrigated wheat yields in the three project districts are expected to increase to modest levels of 3.2 to 3.8 tons per ha in a decade, while in the five project oblasts, average yield improvement in the coming 10 years is modestly set at 14% over the present level.

Table A9.5: Projected Average Wheat Yields

Area	Project Year				
	Without Project	1	5	10	25
Irrigated Wheat					
Kuyi-Chirchik District	3.0	3.0	3.1	3.8	5.1
Zamin District	2.4	2.4	2.5	3.2	4.3
Katakurgan District	3.1	3.1	3.1	3.8	4.6
Tashkent Oblast	3.3	3.3	3.3	3.4	3.6
Djizak Oblast	2.2	2.2	2.4	2.6	2.6
Samarkand Oblast	2.6	2.6	2.8	3.0	3.0
Syrdarya Oblast	2.0	2.0	2.0	2.1	2.3
Kashkadarya Oblast	2.1	2.1	2.1	2.2	2.4
Rain-fed Wheat					
Project Area	0.60	0.60	0.86	1.35	1.56

Source: Ministry of Agriculture and Water Resources and ADB estimates.

5. Wheat Production

22. Based on the projected impact areas and yields, the projected wheat outputs are shown in Table A9.6. Although the project is likely to start during the latter half of 2003, the first benefits from the project are likely to materialize beginning in 2004. Total production of wheat is estimated to rise by 578,931 tons by 2029, or about 38% higher than the present production level in the 5 oblasts. Of particular importance, 337,576 tons of additional wheat will be produced under rain-fed conditions.

Table A9.6: Estimated Wheat Production (tons)

Area	Project Year			
	Present Without Project [a]	5	10	25
Irrigated Wheat				
Tashkent Oblast	345,050	345,353	368,078	401,862
Djizak Oblast	239,900	243,264	269,051	307,536
Samarkand Oblast	260,100	265,385	284,750	310,074
Syrdarya Oblast	190,211	187,504	199,030	212,600
Kashkadarya Oblast	320,560	319,608	340,072	365,104
Total, Irrigated	1,355,821	1,361,114	1,460,981	1,597,176
Rain-fed Wheat				
Total, Rain-fed	175,800	261,419	446,938	513,376

[a] Based on output data in 2000-2001.

Source: Ministry of Agriculture and Water Resources and Asian Development Bank estimates.

6. Economic Returns and Sensitivity Analysis

23. The base-case assumptions applied in the economic analysis are considered to be conservative, particularly in relation to the adoption levels of technologies to be promoted under the Project. The estimated project economic internal rate of return (EIRR) over the 25-year period, was estimated to be 30.8%. The net present value (NPV) of the project investment is estimated at SUM155,737 million with a 12% annual discount rate. The attractive EIRR for the Project is attributed to relatively low investment costs in relation to the substantial benefits that would result from the use of improved wheat varieties and technologies.

24. The sensitivity of the EIRR to lower yields, prices and delayed adoption of new agronomic practices and technologies and increases in costs is presented in Table A9.7. The analysis showed that a 60% increase in the project costs would still yield an EIRR above the 12% hurdle rate. Similarly, the Project will provide robust return even if the benefit streams are confined only to the incremental irrigated wheat production from the three focus districts. Further, the unlikely combination of 25% reduction in wheat gross revenues (either in price or yield) and a 25% increase in project costs, only lower the EIRR to 16.4%. The depreciation of the local currency (SUM) as a result of currency convertibility will marginally increase the EIRR to 32.7%.

25. The economic gross margin analysis has shown that the production of rain-fed wheat under the project will progressively change from one with a very modest economic margin to one, which compares favorably with other rain-fed crops as the efficiency of production increases. In general, the sensitivity analysis highlights the overall economic robustness of the Project.

Table A9.7: Sensitivity Analysis on Economic Return

Scenario	EIRR (%)	NPV (SUM million)
Base Case	30.8	155,737
Sensitivity Analysis Scenario		
Benefits are confined to incremental irrigated wheat output from focus districts, combined with a 60% increase in project cost	12.9	1,935
Wheat prices or yield decline by 25%	17.6	59,980
Costs increase by 25% and project benefits decline of 25%	16.4	49,605
Two year delay in benefit realization	27.4	135,488
Convertibility of the SUM (SERF lowered from 1.3 to 1.0)	32.7	167,332
Switching Values		
% decline in project benefits needed to lower EIRR to 12%	40.0	—
% increase in costs needed to lower EIRR to 12%	470.0	—

— = not available, EIRR = economic internal rate of return, NPV = net present value, SERF = shadow exchange rate factor.
Source: Asian Development Bank estimates.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

A. Linkages to the Country Poverty Analysis

Sector Identified as a National Priority in Country Poverty Analysis:

The Government has yet to develop a poverty assessment and a national strategy for poverty reduction. The most comprehensive poverty assessment conducted to date, Uzbekistan Living Standards Assessment: Policies to Improve Living Standards (May 2003),[1] estimated national poverty level at 27.5% (22.5% and 30.5% for urban and rural areas, respectively). The study estimated that 70% of the poor reside in the rural areas. Since the living standards assessment used a food-based poverty line,[2] the study suggested that about 4.8 million rural residents are unable to meet their basic food requirement.

Therefore, efforts to improve food production, rural incomes, and access to food—through interventions in agriculture—are key to poverty reduction. The national strategy, as outlined in the Program for Strengthening Reforms in Agriculture of 1998, outlines the roles of agricultural sector to ensure (i) the national food security and (ii) sustained economic growth and social stability. Farming is the dominant economic activity. Since independence in 1991, the Government has placed a high priority on increasing wheat production, as the main initiative to ensure food security.

Contribution of the Sector/Subsector to Reduce Poverty in Uzbekistan:

The agricultural sector contributed 28% of the country's gross domestic product (GDP), 60% export earnings, and 44% employment. The wheat subsector provides 23% of agriculture's GDP and is the main staple of the country.

Wheat is the second most widely produced crop in the country next to cotton, and provides more than 50% of calorie intake of the average household. Remote and double landlocked, Uzbekistan needs an assured wheat supply to ensure social stability. Aside from land expansion devoted to wheat cultivation in the past decade, the Government allotted and encouraged the provision of garden plots from large-scale farms to rural farm households partly to enable households to ensure access to wheat production through own production and partly to compensate for the low incomes and limited jobs in the countryside. However, the 10-year experience of increasing wheat production largely through shifting land use from cotton and fodder crops to wheat has become more difficult to sustain due to the deleterious effect of this approach on soil fertility. The Government has thus decided to try a different route of attaining food security. Specifically, current wheat production levels will be sustained by improving productivity levels obtained in the irrigation-deficit (Glossary) and rain-fed areas. This will subsequently enable large farms as well as the private, dehkan, and garden plots to free the fertile well-irrigated lands from wheat cultivation for higher value crops, thereby ensuring more efficient utilization of scarce land and water resources. This approach is pro-poor in that the cultivation of cash crops in irrigated and fertile lands and wheat production in less irrigable and rain-fed areas will still address the food supply needs of the rural poor and, more important, improve their chances of diversifying their income sources and job opportunities. In the medium term, as wheat varieties are improved to address different natural environment challenges, institutional capacity will be built to ensure more efficient extension service delivery and to enable farmers to actively participate in the selection of appropriate technologies to be introduced in the sector.

Through the release of wheat varieties better adapted to production under irrigation deficit and rain-fed conditions, the risks associated with wheat yield fluctuation will be reduced, so helping provide more stable incomes for farmers, which is particularly important for the more vulnerable rural groups. Adoption

[1] Document of the World Bank.

[2] The poverty threshold used in the study was based on the required 2,100 calories per person per day used in many countries. The food poverty line was estimated at SUM3,601 per month in 2000 constant prices. This was about 50% higher than the minimum wage in 2000.

of improved and sustainable cropping systems for wheat will also safeguard the fertility of the soil and limit the risk of environmental degradation. New technologies for raising the productivity of wheat cultivation will also lead to the creation of sustainable jobs in agriculture and the related service sector. The number of jobs created in the two-month harvesting period in the project areas will total 2,750 persons for irrigated and 18,500 persons for rain-fed wheat areas. There will also be additional jobs created in relation to improved cotton production in irrigation-deficit areas following the adoption of new crop rotations allowing the more efficient use of limited water resources.

B. Poverty Analysis **Proposed Classification: Pro-Poor Growth**

The total number of rural poor beneficiaries in the project areas is estimated at 69,000, of whom 55% reside in Kashkadarya, 16% in Djizak, 14% in Samarkand, 9% in Tashkent, and 6% in Syrdariya (Table A10). Poverty incidence, by headcount, is highest in Kashkadarya at 62.6%, more than twice the national average of 27.5%. Djizak also recorded slightly higher than national average poverty incidence at 29.7%. The more fertile and well-irrigated areas of Tashkent and Syrdarya have lower poverty incidence rates of 16.9% and 8.4%, respectively. Almost all poor rural households are *shirkat* (Glossary) employees and *dekhan* (Glossary) plot operators, and less than 1% are private farmers.

Table A10: Rural Poor Beneficiaries by Oblast

Area	Farm Households	%	Rural Poor Households	%	HCR
Tashkent	36,794	16.90	6,218	9.03	16.9
Syrdarya	46,412	21.32	3,899	5.66	8.4
Djizak	37,443	17.20	11,121	16.16	29.7
Samarkand	36,348	16.70	9,596	13.94	26.4
Kashkadariya	60,689	27.88	37,991	55.20	62.6
Total	217,686	100.00	68,825	100.00	31.5

HCR = head count ratio.

Of the three types of poor farm households, households employed by the shirkats are the most impoverished while private households are the least. The Government's family budget survey conducted in 2000 revealed that the per capita expenditures of private and dehkan farms are higher than those of the shirkats by about a factor of 1.4. Around two thirds of the shirkat households' expenditures are spent essentially on food items, in contrast to 53% and 48% for dehkan and private farm households, respectively.

Low profitability of shirkat farms and limited job opportunities in the countryside are the main causes of rural poverty in the project oblasts. In the case of shirkat employee households, inadequate and delayed salary payment is the major source of income instability. The nationwide agricultural reforms have also reduced public sector employment in farm enterprises. The lack of employment opportunities in rural areas will likely become more severe under the present population growth rate and progressive shirkat privatization. In 1991–1999, agriculture output declined by 3.1% while the rural workforce expanded by almost 25%. Assessments from participatory approaches have placed underemployment as high as 40–70% on the shirkat farms. It was estimated that 14% of the able-bodied household members in the sampled dehkan farms are unemployed; in the shirkat households, unemployment is 10%, while unemployment in the private farm households is 5%. Private and shirkat farms are the major sources of on-farm employment; in the latter, permanent workers average less than 60% of their workforce indicating the ready supply of casual workers. In the garden plots, farm works are mostly performed by household members; the plots rarely generate additional jobs for non-household members. According to the Family Budget Survey (2000), the labor force participation rate among men, using the International Labour Organization definition, is 60%, for women is only 31%. Cultural factors are likely to be important reasons for lower female participation rates. High fertility rates are also important. Women with very

young children are much less likely to participate in the labor force. An additional child under 5 years old reduces the female participation rate by more than 7 percentage points. The likelihood of female participation increases, however, with more members in the household. This might be because of the childcare support available in larger families. Women usually perform multiple roles around the house and house plots—doing housework, rearing children, tending garden plots, fetching water, and providing additional income by weeding and harvesting on other farms, spending about 50% of their daily time budget.

In face of hardships, poor households adopt a variety of coping strategies to enhance their standard of living. To augment their inadequate salaries, shirkat employees intensively farm their backyard plots (average of 0.17 hectare [ha]). The number of households with plots has reached 2.5 million, and the average size per family increased from 0.12 to 0.19 ha per family. Income from the garden plots, while better than their wages, is generally inadequate. Additional land plots allotted in recent years are sometimes of poor quality and less irrigable; households lack start-up capital to purchase the inputs or to access credit from formal financial institutions; and dekhan and household plot operators in general have limited technical know-how. To augment household income, household members (especially the women and young adults) are also engaged in farm work (weeding and cotton harvesting). Families residing near urban centers are engaged in off-farm work, mainly trading and services.

To reinvigorate the farming sector and generate rural employment, since 1998 the Government has initiated a farm restructuring program to break up large shirkats into household-owned private farms. Key problems, nonetheless, remain in the forms of deteriorating irrigation facilities, shortage of farm machinery, insufficient supply of good-quality seeds and agro-chemicals, poor-quality land (due to salinization), and limited knowledge of more cost effective farming practices. Private farms, as in the case of shirkats, encounter challenge to productivity improvement because of rigid controls on wheat and cotton prices and, up to 2003, state control on land allocations to various crops.

C. Participation Process

Stakeholder Analysis Prepared

A participatory rural assessment was conducted in July 2000. Issues faced by rural households were verified through consultations with three separate household groups: household employees of shirkat farms, employees of private farms, and private farmers. Staff of concerned agencies, research institutes, local governments, and private business people were involved in project design. Agencies that were consulted include the State Committee for Nature Protection (SCNP); State Committee for Land Resources; and agriculture and water resources departments at the central level and their branches in Tashkent, Djizak, and Samarkand, and the three project districts.

In February 2002 and July 2003, field consultations were made involving more than 80 people, mostly farmers in three project districts, including heads of associations of private and dekhan farmers, household members, and private businesspeople. Awareness was raised on the project rationale and its components. Concerns, particularly on types of technologies to be introduced, farm equipment needed, and cost recovery mechanism, were raised and taken into account in the project design. Farmers interviewed confirmed that project interventions are in line with their priority needs. Farmers also concurred that project support to introduce balanced cropping patterns and improve on-farm soil and water management will raise farm sustainability and incomes.

Participation Strategy

Awareness raising of project activities will continue during project implementation, through public consultations and disclosures by the project site offices and local governments, whose activities and field visits will be supported by the Project. Farmers will be consulted before design; repairs of on-farm irrigation facilities; and selection of sites for technology demonstration, variety testing, and seed production.

The Project's most significant potential poverty impact is the development of institutional networks that try out an array of different collaboration work of the public and private sector, research institutions and

rural producers, direct involvement of local governments, and private sector participation in supplying seed and farm inputs. The representation of poor farm households in the various institutional groupings envisaged in the Project will enable the poor households, not merely to serve as passive recipients of technological innovations and farm management practices, but also to become active participants in planning and deciding the future of their communities. The establishment of institutional networks with participation from poor farm households will thus provide venues for the poor to be heard and, at the same, will increase their capacity to become change makers. This will require that institutional networks envisioned for the Project ensure broad representation and participation of poor farm households at farm and community levels, ensuring a minimum 30% representation of different groups (critical mass).

Participation of poor rural household beneficiaries in the different institutional groupings will be ensured at the initial stages when establishing the institutions. The monitoring and evaluation system that will be built into the project will guarantee periodic assessment of participatory mechanisms of all project activities. Feedback measures will also be instituted to give poor households and all stakeholders venues to ventilate their needs and evaluate the performance of project activities.

D. Gender Development

Strategy to Maximize Impacts on Women: The overall gender strategy of the Project is to (i) raise awareness within the project agencies, research institutes, and among beneficiaries of the gender-related issues that has arisen in the agricultural sector; (ii) address gender-disparity in access to agricultural services in the project area, including access to project activities (training, jobs); and (iii) identify the project interventions that will increase women's access to food and income and empower them to participate in community groups and water users' associations (WUA).

Output Prepared: Gender Action Plan (see next section).

E. Gender Action Plan: Component and Targets for Gender Strategy

Component	Target	Verifiable Indicators
Varietal Development and Testing	▪ Awareness of female staff of the project research institutes (Andijan/Galla Aral Cereals and Legumes Research Institute and Plant Genetics Institute) and regulatory agencies (State Commission on Varietal Testing [SCVT]) of the project objectives and activities	▪ All female staff are aware of project objectives and project related work and training opportunities.
	▪ Female staff of project institutes and agencies participate in project sponsored staff training	▪ Percentage of women participating in domestic/overseas training represents staff gender ratio at the institutes/agencies.
	▪ Opportunities for female staff of the institutes and agencies to work on project activities	▪ Percentage of women participating in project work represents staff gender ratio at the institutes/agencies.
	▪ Conduct gender-sensitivity training workshop for counterpart staff	▪ Number of gender sensitization training sessions. Responsibility: Project Management Office (PMO), research institutes, SCVT, Consultant
Enhanced Farm Management	▪ Female farmers' access to training and demonstrations for	▪ Women-headed farms will have priority in technical training on new farming

	adoption of new farming practices (on soil fertility management, crop husbandry) provided by rural business advisory centers ▪ Female farmers' participation in WUAs and farmers' associations in project areas ▪ Participation of female staff of project research institutes in project-sponsored training and activities	practices. ▪ The percentage of women members of WUAs and farmers' associations will be no less than shares of women-headed households in the irrigation command areas or project communities. ▪ Percentage of female staff participation in training and project activities reflects staff gender ratio at the institutes/agencies. Responsibility PMO, Ministry of Agriculture and Water Resources, RBACs, local governments, Agricultural Institute for Mechanization and Electrification, Central Asian Institute for Irrigation Research
Project Management	▪ Monitoring gender issues and performance indicators relevant to the Project ▪ Equal opportunity and compensation for women in project hiring • Conduct of gender-sensitivity training workshop for counterpart staff	▪ A gender action plan focal point is identified from among the PMO staff. ▪ Gender-disaggregated indicators are identified (with assistance of the monitoring and evaluation specialists) for collection during project implementation. ▪ Gender-disaggregated indicators are monitored. ▪ Gender balance in PMO, Rural Restructuring Agency (RRA), and RBAC hiring is monitored. ▪ Gender-sensitization training sessions are held. Responsibility: RRA, PMO, Association of Dekhan and Private Farmers, RBACs, Consultant

F. Social Safeguard and Other Social Risks

	Significant/ Non-significant/ None	Strategy to Address Issues	Plan/Actions Required
Resettlement	None		
Affordability	Nonsignificant	Financial analyses showed that target farms will be able to afford improved seeds, farm machinery rental, and agrochemicals to be provided. Poor households with only access to backyard plots (but employed in shirkat and private farms) will have immediate access to the improved seeds, as wage payment, one	The project monitoring and evaluation system will monitor the dissemination and use of improved varieties into backyard plots.

	Significant/ Non-significant/ None	Strategy to Address Issues	Plan/Actions Required
		season after they are introduced to larger shirkats and private farms.	
Labor	Nonsignificant	Project interventions will not displace workers but will generate incremental labor demand at farm, particularly in dryer areas, and at the enterprises.	Risk of labor exposure to fertilizers and other agrochemicals during weeding in spring will be monitored by Project Site Office and SCNP.
Indigenous Peoples	None		