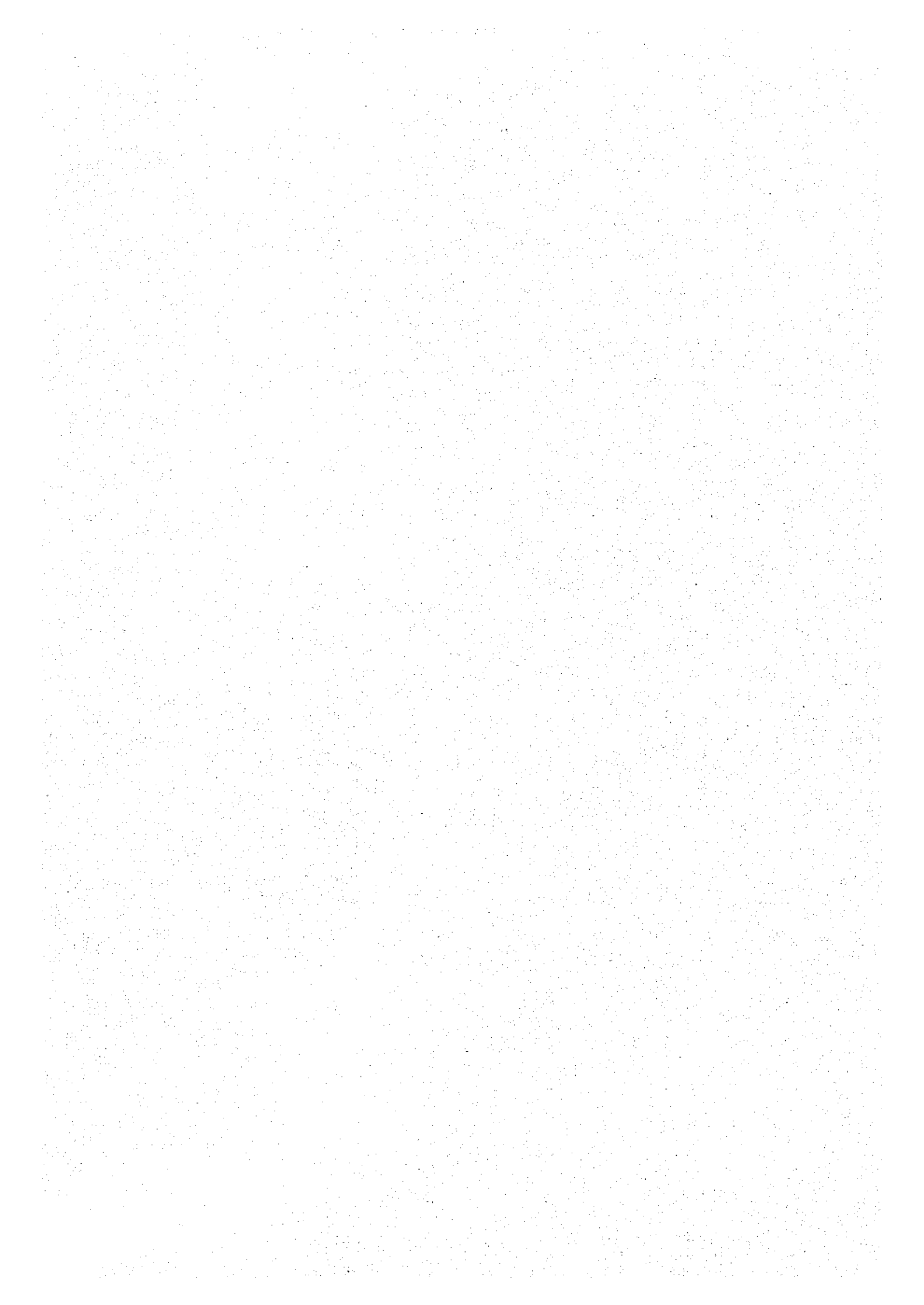


Appendixes



Appendix D.1

WATER USER ASSOCIATION MODEL CHARTER AND BY-LAWS

I General

- 1.1 The water user association (WUA) is an organization established on the basis of the *voluntary* association of water users in the project area.
- 1.2 Membership in the water user association is open to all irrigation water users in the project area including, but not limited to peasant farmers, production cooperatives, joint stock companies, and other agricultural production entities.
- 1.3 The main purpose of the water user association is the efficient joint use of project irrigation water, the provision of a fair and equitable distribution of water among all members, preparation of irrigation canals and other irrigation system structures, and the operation and maintenance of said system.
- 1.4 The water user association shall charge water fees to users which cover the cost of water from the Committee on Water Resources and the operation and maintenance of the project irrigation system.
- 1.5 The water user association is a legal entity from the time of its registration.

2 Assets and Debts of the Water User Association

- 2.1 The irrigation system within the project domain, including the canals, hydraulic structures, pumps, drains, and other irrigation infrastructure shall be the property of the water user association.
- 2.2 A water fee shall be established annually based on a volumetric, per hectare, or crop consumption basis to cover the cost of water from the Committee on Water Resources, the ongoing operation of the system, and the periodic maintenance of the system. Adequate funds shall be set aside in a revolving maintenance account for the purchase and repair of broken irrigation equipment and infrastructure.

3 Functions and Obligations of the Water User Association

The water user association shall:

- 3.1 Manage the assets and debts of the association pursuant to the law.
- 3.2 Receive water in bulk at its control point(s) and distribute it among the association's members using measurements of water based on volume, time, crop consumption, or some other scientifically valid technique.
- 3.3 Draw up annual water use plans and water delivery schedules and share such plans and schedules with all of the water users at the beginning of each irrigation season.
- 3.4 Carry out the annual plan and delivery schedule. If changes in the plan or schedule are needed, the revised plan and schedule shall be shared with all affected members.
- 3.5 Furnish hydro-metric information to water user association members.

- 3.6 Prepare annual maintenance schedules and reports for WUA members, keep the canals, drains, and other infrastructure in good condition, and repair all equipment for which it is responsible.
- 3.7 Implement and supervise a program that takes samples of canal water, groundwater, and drain water to assure adherence to supervisory measures which prevent environmental degradation, excessive salinity, and which satisfy relevant government requirements.
- 3.8 Supervise the use of irrigation water in each plot and paddy so as to upgrade the production and productivity of crops and to prevent over-application of water.
- 3.9 Charge water users an appropriate annual irrigation fee, and in the event of non-payment, suspend water service to delinquent plots.
- 3.10 Manage the funds collected for irrigation service and pay the supplying agency in full and on-time. Should the account develop a surplus, such funds would be used for infrastructure improvements or be reverted to water users as a reduced fee in the subsequent irrigation season.
- 3.11 Keep accounts of its budget execution and submit financial statements to the Board of Directors annually or upon demand. The annual financial report will be shared with the full membership.
- 3.12 In emergency situations, make available all personnel and equipment to execute any defensive works or repairs which may be urgently needed to protect the integrity of the irrigation infrastructure and to protect crops.
- 3.13 Ensure that officers are appointed from different sectors of the project area on a rotating basis and assure that the management of the system is equitable to all members.
- 3.14 Resolve complaints and conflicts among and between water users with due process, assuring that the rights of the members are reflected in all deliberations of findings and redress. Initial complaints are to be heard by the manager who will seek to resolve the problem informally. In the absence of a resolution satisfactory to the complainant(s), the conflict will be heard by the Board of Directors.

The water user association shall not:

- 3.15 Put irrigation water to uses other than agricultural, unless approved by the General Assembly.
- 3.16 Use the proceeds for water user fees for purposes other than the payment of the water costs at the delivery point(s), operation and maintenance of the system, purchase of needed irrigation equipment and machinery, and bona-fide salary and administrative costs, without approval of the General Assembly.

4 Administrative Organs of the Water User Association

- 4.1 The water user association shall be governed by the *General Assembly*, which is the supreme administrative organ of the association. The General Assembly shall convene at least annually, or more often, if called upon by the WUA manager. All decisions shall be taken by majority vote, except the amendment of the by-laws which requires a 2/3 vote. No decision of the General Assembly may usurp the

rights of an individual member. The General Assembly will elect the Manager and the Board of Directors who serve for three year terms. The General Assembly may terminate the Manager or any Director by majority vote at any time. The General Assembly is comprised of all of the registered members of the water user association who are in good standing.

- 4.2 The *Board of Directors* is the administrative directorate of the water user association. Within the by-laws, the directors set policy, monitor all debts and assets, and supervise the work of the Manager. The Manager is a non-voting member of the Board. The Board is comprised of eight elected members who serve for terms of three years. Directors may serve for a maximum of six consecutive years.

5 Rights and Responsibilities of Water User Association Members

- 5.1 Members of the association shall consist of all peasant farmers, independent farmers, and production cooperative members in the project area who wish to join.
- 5.2 Each member has the right to leave the association at any time, however such individuals lose their irrigation rights.
- 5.3 Each member has the responsibility to participate in collective activities which maintain the project's irrigation system.
- 5.4 Each member has the right to be elected to the Board of Directors or to be elected Manager of the WUA.
- 5.5 Members may be suspended or dismissed from the water user association by a majority vote of the Board of Directors for repeated non-payment of fees or other serious breach of water user association by-laws, including taking water out of turn, taking water in unallocated volume, or tampering with or destroying any WUA structure or property.
- 5.6 Each member has the right to a fair and equitable volume of water according to his share in the annual irrigation schedule. Water will be delivered in a timely manner.
- 5.7 Each member has a right to complain to the Manager and/or Board of Directors for just cause and to be heard with due process.
- 5.8 Members have the right to vote in each General Assembly Meeting on any issue, including the election of the Manager and Directors, and the ratification or amendment of the by-laws.
- 5.9 Members have a right to see the association's public records.
- 5.10 During periods of drought or low water supply, the system will assure priority water service to personal gardens within the project area.

6 Responsibilities of the Water User Association Manager

The Manager shall:

- 6.1 Respond and be accountable to the Board of Directors and General Assembly.
- 6.2 Be elected by the General Assembly, and in the even of unsatisfactory performance, terminated from the position.

- 6.3 Appoint and supervise and terminate any water user association employee.
- 6.4 Be responsible for calculating irrigation water user fees based on actual system costs and obligations and for collecting said fees from all users based on their share or allotment.
- 6.5 Be responsible for maintaining the association's infrastructure and machinery.
- 6.6 Act as mediator and decision maker on conflicts among and between water users. Conflicts which cannot be informally resolved by the manager will be heard by the Board of Directors for final resolution.
- 6.7 Administer all by-laws and regulations.
- 6.8 Oversee and implement the operation and maintenance plan.
- 6.9 Be accountable for all association expenses and obligations.
- 6.10 Sign and administer any and all contracts upon approval of the Board of Directors.
- 6.11 Purchase and oversee the maintenance of all needed equipment and property.
- 6.12 Be appointed by the Board of Director and shall not be appointed by any government agency.
- 6.13 Act as the spokesperson and representative of the association on all official matters.

7 Responsibilities of the Board Of Directors

The Board of Directors shall:

- 7.1 Be elected for limited terms of three years by the General Assembly. No director may serve for more than two consecutive terms.
- 7.2 Draft association by-laws and regulations and submit them for ratification by the General Assembly.
- 7.3 Approve all contracts and binding documents before their signature.
- 7.4 Keep members informed of all policies and procedures.
- 7.5 Advise the Manager on policy questions.
- 7.6 Protect the rights of all water users.
- 7.7 Monitor the financial reports of the Manager.
- 7.8 Assure that all water users have access to water in accordance with their share.
- 7.9 Approve all major expenditures.
- 7.10 Serve as court of last resort on all association conflicts and disputes.

References

World Bank (1997). *Kazakstan Farm Restructuring Project: Aide Memoire*. Washington, DC: The World Bank.

Development Alternatives Inc. (1996). *Study on Rural Credit and Savings in Kazakstan*. Washington, DC: Development Alternatives, Inc.

Asian Development Bank (1996). *Strengthening the Implementation of Agriculture Sector Loans: Final Report*. Almaty, Kazakstan: Asian Development Bank.

Mott McDonald/Temelsu Joint Venture (1997). *Irrigation and Drainage Improvement Project: Management and Engineering Component*. Almaty, Kazakstan: Mott McDonald/Temelsu Joint Venture.

World Bank (1996). *Staff Appraisal Report: Republic of Kazakstan Irrigation & Drainage Improvement Project*. Washington, DC: The World Bank.

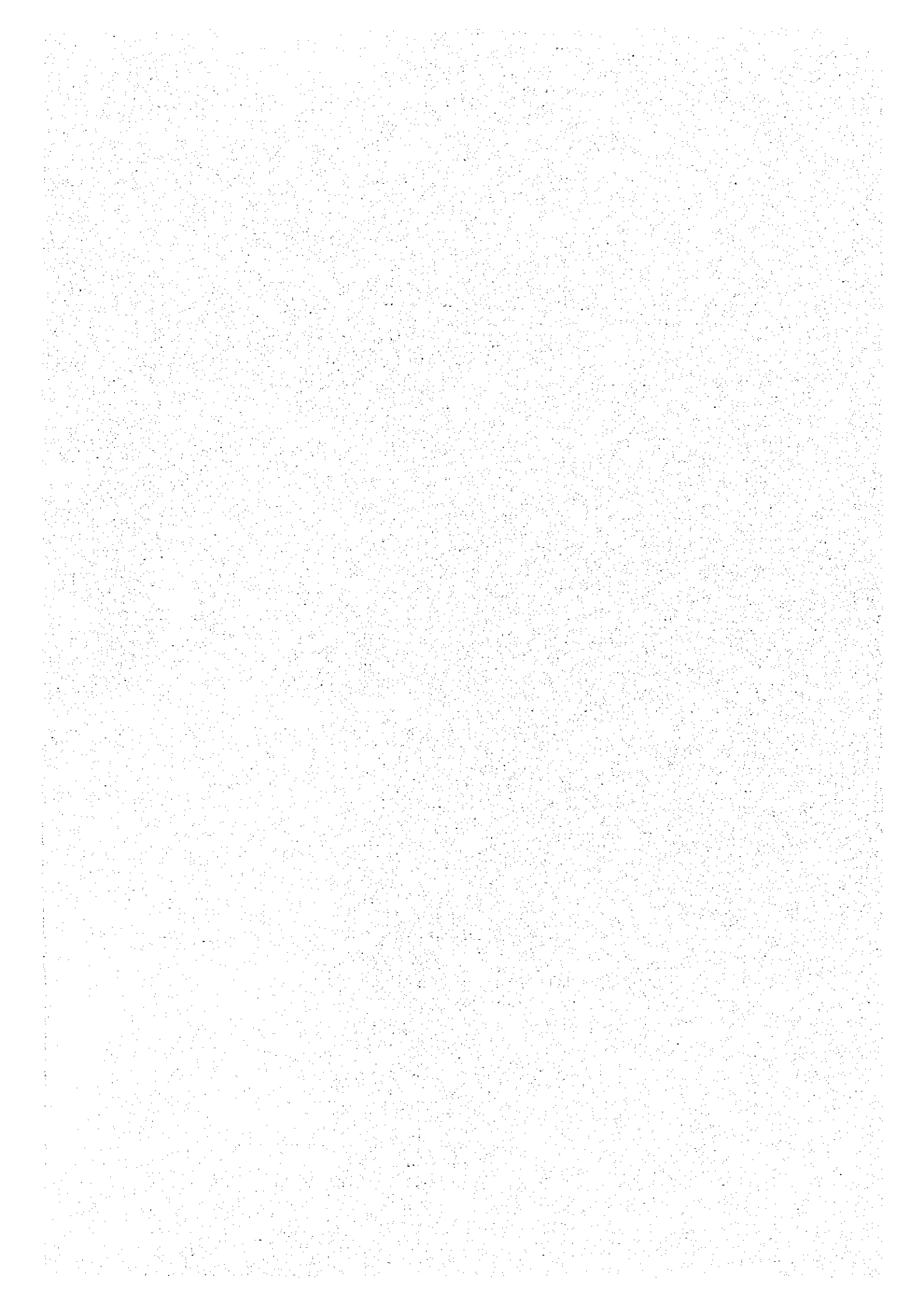
Asian Development Bank (1997). *Water Resources and Land Improvement Project*. Almaty, Kazakstan: Asian Development Bank.

AHT International (1997). *Inception Report: Kazakstan Irrigation and Drainage Improvement Project: Agricultural Component*. Almaty, Kazakstan: AHT International.

National Statistical Agency of Kazakstan (1997). *Statistical Bulletin No. 4*. Almaty, Kazakstan: National Statistical Agency.

ANNEX - E

AGRICULTURE AND AGRO-ECONOMY



ANNEX-E

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ANNEX - E

AGRICULTURE AND AGRICULTURAL ECONOMICS

1 Economic Background

Since 1990, the Gross Domestic Product (GDP) of Kazakhstan has fallen by 40 percent. Following table shows GDP in current Tenge and US\$ for the years 1994-96 and an estimate for 1997. However, it appears that the economic situation is beginning to improve, the economy actually grew by 1% in 1996, and it is estimated that 1997 rate of growth will be 3%. In current dollars, per capita GDP has increased from US\$ 699 in 1994 to US\$ 1,276 in 1996. Agriculture's share of GDP has fallen from 29% to 12%. The rate of inflation was 39% in 1996, and the estimated rate for 1997 by The Economist is 25%.^{1/}

Gross Domestic Product in Current Prices

Year	Gross Domestic Product		GDP per Capita (US\$)	Rate of Exchange
	Million Tenge	\$US Million		
1994	423,484	11,842	699	35.76
1995	1,019,722	16,736	1,003	60.93
1996	1,419,888	21,104	1,276	67.28
1997	1,800,000	24,900	1,505	75 (Aug)

Source: National Statistical Agency, Republic of Kazakhstan, Statistical Bulletin No. 4 1996, Almaty, 1997, p.81 & p.85. and 1997 estimate is from The Economist, "The World in 1997"

National Income by Sector in Percent of GDP

Sector	1991	1992	1993	1994	1995	1996
Industry	26.7	31.2	28.3	28.7	23.4	21.3
Agriculture	28.9	23.3	16.1	14.7	12.1	11.9
Construction	10.3	7.8	10.5	10.7	6.1	3.4
Transport & Communication	7.3	7.5	9.9	11.0	10.6	9.4
Trade	6.1	5.2	7.8	9.9	16.1	18.2
Health Care & Education	7.9	4.1	7.0	4.7	6.1	6.8
Others	12.8	20.9	20.4	20.3	25.6	29.0
Total	100	100	100	100	100	100

Source: Abt Associates, Inc., Study on Market Reforms in the Agriculture Sector, ADB T.A. No. 2448-KAZ, April, 1997.

Average monthly employment in 1996 was 4,432,000 people of which agriculture was the largest employment sector, providing 23% of total employment as shown below. The national average monthly salary in Kazakhstan was T. 6851 (US\$101.83) in 1996. The average monthly salary of workers in agriculture was T. 3558 (US\$52.88) and the average monthly salary of workers in education was T. 5003 (US\$74.35).^{2/}

Sector	Persons ('000)	Sector	Persons ('000)
Industry	935	Education	618
Construction	264	Science	31
Agriculture	1,017	Culture & Art	57
Transportation	367	Health	380
Communications	78	Credit & Insur.	43
Trade	162	Administration	143
Housing	178	Total	4,432

Source: National Statistical Agency

^{1/} The Economist, "The World in 1997", 1996.

^{2/} National Statistical Agency of Republic of Kazakhstan, Statistical Bulletin 1996, No. 4, Almaty, 1997, p.20.

By the end of March 1996, 206,000 persons were registered as unemployed; 4.2% of the work force. However, taking into consideration people who are on unpaid leave, working without pay, or otherwise not registered, the real unemployment rate is probably 15%.^{3/}

The value of imports and exports for 1993-96 is shown in following table. Kazakstan has had a favorable balance of trade over these years except in 1994 when there was a deficit of US\$330 million.

(Unit: US\$ million)			
Year	Imports	Exports	Balance
1993	471.6	1,485.5	1,013.9
1994	3,561.2	3,230.7	-330.5
1995	3,781.0	4,974.5	1,193.5
1996	4,261.3	6,230.4	1,969.1

Source: National Statistical Agency

The major exports of Kazakstan are minerals, base metals, and vegetable products. Mineral products and base metals are also major imports, along with machinery and appliances. Kazakstan's major trading partner is the Russian Federation which accounted for 48.9% of external trade in 1996. Other CIS countries are next in importance as trading partners. The country has had a negative balance of payments, amounting to as much as US\$1.5 billion in 1995. However, the situation improved in 1995, and as of the 3rd quarter, the deficit appears to have lessened further in 1996.

2 Agricultural Background

2.1 Present Situation of Agriculture

Agriculture has long been a significant sector in the Kazakstan's economy. In 1994, it accounted for 28% of Gross Domestic Product (GDP) and provided employment to over 23% of total employment. About 200 million ha, or 75% of Kazakstan's total area, is used for cropping and grazing. Cropped land covers 35 million ha, of which 33 million ha is rainfed and about 2.4 million ha is irrigated. Cereals cover about 62% of total cropped area with fodder crops and vegetables accounting for most of the rest.

Since dissolution of Soviet Union, the financial situation of most farms has deteriorated markedly in the past five years, with a sharp increase in the number of farms reporting losses. The losses have been largely due to official pricing and marketing policy that depressed producer prices well below world market levels, while the prices of input were liberalized and increased. Under this condition, fertilizer application is decreasing year by year, and worn-out farm machinery is not being replaced and moreover fuel shortage disrupting planting and harvesting activities. As a result, production has sharply decreased as shown below due to decrease in the area of planting and yields of crops.

(Unit: '000 ton)							
Crop	1986-90*	1991	1992	1993	1994	1995	1996
Whole grain	24,104	11,992	29,971	21,631	16,545	9,506	11,237
Paddy	590	521	467	403	282	183	226
Wheat	13,663	6,889	18,285	11,585	10,033	6,490	7,678
Barley	6,737	3,085	8,510	7,148	5,871	2,208	2,695
Maize	493	330	367	355	233	136	122
Other grains	2,621	1,167	2,342	2,140	126	489	516
Sugar beat	1,431	726	1,160	843	433	341	371
Sunflower	117	108	122	86	97	99	64
Cotton	321	291	252	200	160	223	183
Vegetables**	3,676	3,401	3,842	3,286	2,967	2,498	2,436

Note: * Average value in 1986 to 1990, **Including potato and melons

Source: National statistical Agency

^{3/} The Economist Intelligence Unit, Country Report Kazakhstan, 2nd Qtr, 1996.

2.2 Agricultural Development Policy and Strategy

As mentioned above, the performance of agriculture sector has been declined sharply since dissolution of the former Soviet Union, particularly in recent five years. The Government has recognized the crucial situation of the sector and paying her effort mainly to (i) price and trade policy of the Government, (ii) marketing reform, (iii) farm privatization and restructuring of the state enterprises, and (iv) improvement of agricultural productivity.

The establishment of price and trade policy is urgently needed to solve the cost-price squeeze caused by the facts that the price for agricultural commodities has not been liberalized, but at the same time price for industrial products and agricultural inputs has been liberalized. Meanwhile, the market reform is aimed at privatizing the state enterprises that were formerly responsible for all aspects of marketing of agricultural inputs and products and processing of agricultural commodities, establishing a free market system, and encouraging the entrance of new trading, input supply and processing firms into the sector

Privatization of the state agricultural enterprises has been almost completed in 1996. New entrants to the sector are being encouraged by the gradual development of a legal and regulatory environment conducive to commerce. Already many of structure for marketing and processing of livestock products, fruits and vegetables have been bypassed by private sector marketing channels. Less progress has been made in the development of alternative channels for grain trade though the private traders and exporters are offering increasing competition to former state owned firms.

Concerning the improvement of agricultural productivity, the agricultural research and extension service are of great importance to the profitable agriculture. At present, there is no agricultural extension service system. Since high progress of privatization in the agricultural sector and an increase in the number of private family farms are expected in the near future, the extension service system and farmers' training program need to be established. Government has started setting up an extension service program in MOA for farmers' education and training. At the same time, agricultural research institutes are being reorganized under the National Academy of Science at the national and oblast levels.

3 Master Plan for the Kzyl-Orda Left Bank Area

3.1 Location and Administration

The Kzyl-Orda Left Bank Area (the Study Area) consists of four raions in the agricultural area located in west of Kzyl-Orda capital city of the Kzyl-Orda Oblast. This oblast is an administrative unit located in south-central part of Kazakstan bordering Uzbekistan to the south, Aral Sea to the west, South Kazakstan Oblast to the east and Zhezkazgan and Aktobe Oblast to the north. The Kzyl-Orda Oblast comprises 228,100 km² encompassing 8 raions, 2 cities, 11 town type settlements and 97 rural settlements (farms). The Study Area includes agricultural and non agricultural lands on the left (south) bank of the Syr Darya river. The Area encompasses 430,000 ha: Syrdarya (37,500 ha, 9%) with three farms, Terenozek (78,300 ha, 18%) with four farms, Zhalagash (130,640 ha, 30%) with ten farms and Karmakshy (183,560 ha, 43%) with seven farms as shown in Table E-1.

3.2 Population and Labor Force

The Kazakstan Census Bureau estimated the population of Kzyl-Orda Oblast at 676,800 people in October 1996. The urban population in the Kzyl-Orda Oblast is more than that of national average; 429,900 (63%) reside in urban area, of which 160,700 are living in Kzyl-Orda City, and 246,900 (37%) live in rural communities. Although the population of Kzyl-Orda Oblast is remaining steady, there is an out-migration process underway, which is attributed to limited employment opportunities, showing the excess of out-migration by 13,700 in 1994, and 8,900 in 1995 respectively.

The present population and number of households in the Kzyl-Orda Left Bank Area are estimated at about 53,100 persons in 8,730 households based on the result of farm survey conducted under the sub-let contract. The following table shows the present population and number of households in the Kzyl-Orda Left Bank Area involved in the respective raions.

Raion	Total Resident Population	Total number of Household	Average size of household
Syrdarya	9,426	1,597	5.9
Terenozek	11,149	1,828	6.1
Zhalagash	18,026	2,907	6.2
Karmakshy	14,508	2,402	6.0
Total/Average	53,109	8,734	6.1

The Kzyl-Orda Oblast is located within the Kazak region of the country and the ethnic structure reflects a profile quite different from that of the nation. Fully 93% of the population of Kzyl-Orda Oblast is Kazak, only 4.3% is Russian and no other ethnic nationality comprises more than 1% of the total.

To estimate the size of the economically active population of the Kzyl-Orda Left Bank Area, the percentage of able bodied person aged 16-69 in the raion is firstly calculated based on the information collected from the Kzyl-Orda Labor Protection Department, and applied to the population of the Kzyl-Orda Left Bank Area. Following are estimates of economically active population in the Kzyl-Orda Left Bank Area by raion.

Raion	Population	Percentage of Economically Active Population	Economically Active Population of household
Syrdarya	9,426	45.2	4,261
Terenozek	11,149	45.4	5,062
Zhalagash	18,026	47.1	8,490
Karmakshy	14,508	46.0	6,674
Total/Average	53,109	46.2	24,487

3.3 Present Conditions of Agriculture

3.3.1 Land Holding and Land Tenure

Prior to 1991, agriculture in Kazakstan was exclusively a function and responsibility of the state. Excepting private subsisting gardens, all farming activities was overseen by the Ministry of Agriculture. Legislative decrees on the process of privatization began in 1991 and culminated in 1996 when prices of farm commodities were fully liberalized. By October 1996, all the state farms had been privatized except for the state research farms which remain the responsibility of the state.

At that time, all the property of the state farm except farm land had been allocated to all the farm members on paper, considering on the position in the farm and service period. The land is still the property of the state, however the Government had granted inheritable rights of use to the farm members on lease of 99 years or less.

Based on the Presidential Decree on December 1996, 80% of farm's land has been equally allocated to the farm members during the period from January to April 1997. Twenty percent of farm's land has been held in reserve for inheritance by newly borne people. These reserved land is managed by raion administration. Village communal land is still managed by village administration. On the paper, all of the farm land has been allocated to the farm members, however, a larger part of farm land is still held in common and only limited land is completely privatized. In some farms, the farm land was allocated to all the individuals living in the farm and in other farms, that was allocated to the only adults living in the farm. After privatization, at general assembly of former state farm, a larger part of farm members decided that they operate the former state farm as production cooperative. The production cooperatives

are governed under publicly-registered charters and by-laws which are approved by raion administration. In almost all the production cooperatives, all the right of farm land and properties for crop production is temporarily entrusted to the farm manager for a few years.

After privatization, some of the farm members established independent family farm or a small farm unit of several household, so called "peasant farm", which are mostly related by family. Out of these, a farmer group established a small scale collective farm which is loosely and informally organized, and do not have any charter or by-law. In these farms, the right of farm land belongs to the each farm member.

3.3.2 Present Land Use

The present land use pattern of the Kzyl-Orda Left Bank Area was clarified based on the 1:100,000-scaled landaus map prepared by the Oblast Committee on Land Relations and Organization of land Use (1995) and information collected from the Oblast Committee on Water Resource (1996). The land use pattern has been further confirmed through field survey and analysis of agricultural statistics.

The present land use in the Kzyl-Orda Left Bank Area in 1995 is shown in Table E-2 and Figure E-1, and summarized below.

Land Use Category	Area (ha)	Proportion (%)
(1) Agricultural land		
-O. R. A.**	87,000	20
-Pasture	237,300	56
Sub-total	324,300	76
(2) Non agricultural land		
- Marsh and swamp	5,440	1
-Bush and forest	14,740	3
-Others	85,520	20
Sub-total	105,700	24
Total	430,000	100

Note *: includes roads, rivers, resident areas and dessert

Source: Oblast Committee on Water Resources, Oblast Committee on Land Relation and Organization of Land Use

The Kzyl-Orda Left Bank Area occupies an area of 430,000 ha, of which 324,300 ha or 76% of the total area is used for agricultural purpose including livestock grazing and hay making. While the non-agricultural land area is 105,700 ha which includes marsh and swamp, bush and forest, village road, rivers, canals and desert.

A difference in the area ratio of agricultural land to the total area among the related raions concerned. The area ratio of agricultural land to the total farm area is the highest in Zhalagash Raion (87%), followed by Terenozek Raion (71%) and lowest in Karmakshy Raion (69%). There is also big difference in the area ratio of rice rotation area to the total farm area, it is the highest in Terenozek Raion (30%), followed by Zhalagash Raion (26%), Karmakshy Raion (14%) and Syrdarya Raion (9%).

The original rice rotation area (original irrigation area) in the Kzyl-Orda Left Bank Area is 87,000 ha as shown below.

Causes	(Unit: ha)				
	Syrdarya	Terenozek	Zhalagash	Karmakshy	Total
Original rice rotation area	3,330	23,670	34,400	25,600	87,000
Presently irrigation area*	2,780	20,830	28,190	23,280	75,080
Presently abandoned area*	550	2,840	6,210	2,320	11,920

Note: *: in 1995

Source: Oblast Committee on Water Resources

According to the above table, 11,920 ha or 14% of the rice rotation area is abandoned by some problems, such as water shortage due to deterioration of irrigation canal system, soil salinization and water logging caused by poor drainage system and other reasons. The following table shows the area abandoned by respective causes:

(Unit: ha)					
Causes	Syrdarya	Terenezek	Zhalagash	Karmakshy	Total
Shortage of irrigation water	330	790	960	790	2,870
Salinity	60	510	1,230	190	1,990
Water logging	0	540	960	640	2,140
Others	160	1,000	3,060	700	4,920
Total	550	2,840	6,210	2,320	11,920

Note: Others includes worn-out agricultural machinery and shortage of agricultural inputs

Source: Syrdarya, Terenezek, Zhalagash and Karmakshy Raion Administration

Twenty four percent of the abandoned area is caused by shortage of water, 17 % by salinity problem, 18% by water logging and 41% by to other problems such as worn out agricultural machinery and shortage of agricultural inputs.

3.3.3 Cropping Pattern

The climate in the Study Area is very severe for crops; long winter, short spring and autumn and high temperature in summer. The cropping season of summer crops is limited from late April to September (less than 130 days). In addition, soil is alkaline, and accumulation of salts on soil surface is observed. Crops cultivated in the area should therefore have a short growth duration and be tolerable to salinity and high temperature in summer, which limit the selection of suitable crops. Under such natural conditions, and considering the marketability and benefit, the major crops presently cultivated are paddy, wheat and lucerne, and other crops are cultivated in very limited area as shown in the cropping pattern (Figure E-2).

Of presently irrigated area of 75,080 ha, about 68,430 ha was planted with crops in 1995, and the rest of 6,650 ha remained fallow as shown in Table E-3 and Figure E-2 and summarized below:

Crops	Syrdarya	Terenezek	Zhalagash	Karmakshy	Total
Paddy	910	7,720	8,510	6,450	23,590
Wheat	630	3,730	4,960	5,270	14,590
Industrial crop	20	380	780	1,030	2,210
Vegetables*	30	760	1,070	440	2,300
Lucerne	870	5,510	9,910	5,590	21,880
Other crops	20	1,260	1,190	1,370	3,840
Total	2,480	19,360	26,420	20,150	68,410
Cropping Intensity	0.74	0.82	0.77	0.79	0.79

Source: National Statistics Agency

Note: Vegetables include potato and melon

Since the Department of Agriculture recommends that the fallow period should not be allowed in crop rotation in the Study Area at present, 6,650 ha of fallow land can be supposed to be caused due to shortage of water, soil salinity, water logging and shortage of agricultural machinery and farm inputs. The cropping intensity in the area is 0.79, and though is a little difference in cropping intensity among the raion, ranging from 0.74 to 0.82. In the four raions concerned, paddy and lucerne are major crops followed by wheat. The Lucerne is a major fodder crops in the area, which occupies more than 90% of total fodder crop area. The planted areas of paddy and lucerne occupy more than one third of the total planted area, respectively. The planted areas of industrial crops, potatoes, vegetables and other cereal crops are very limited in all the raions. Vegetables, potato and melons are mainly cultivated in the kitchen gardens.

Recently, the planted area of major crops shows a decreasing tendency. Total planted area in 1993 was approximately 73,250 ha and has decreased to 68,430 ha in 1995. Cropping intensity was 0.84 in 1993 and decreased to 0.79 in 1996. The planted areas of major crops in 1993 to 1997 are summarized below:

(Unit: ha)							
Year	Paddy	Wheat	Ind. Crop	Vegetables	Fodder	Other	Total
1993	28,280	11,840	720	3,010	21,800	7,600	73,250
1994	28,640	11,800	1,040	2,490	20,950	6,240	71,160
1995	23,590	14,590	2,210	2,300	21,880	3,860	68,430
1996	23,510	9,580	870	3,480	20,550	460	58,450
1997	24,230	5,950	930	2,950	19,850	380	54,290

Source: National Statistics Agency

Note: Vegetables include potato and melons

According to the above table, the paddy area has sharply decreased, while there is a slight change in the areas of wheat, vegetables and lucerne during the period from 1993 to 1995. Only the planted area of industrial crops has increased in the same period. After 1996, planted area of wheat and minor crops decreased drastically, while those of paddy, vegetables and fodder crops are little changed, although the total planted area is decreasing.

Officially each farm can decide their cropping pattern, however, there was a strong recommendation on the cropping pattern by oblast administration and raion administration until 1995. All the farms were required to supply some amount of cereal grains according to quotas assigned by the State, so called the "state needs". After 1996, the farms are completely free from the "state needs" and can actually decide their cropping pattern. After 1996, cropping pattern is drastically changed. Planted area of wheat and minor crops decreases drastically, while paddy area does not decrease although the total cropping area decreases.

A decrease of planted area is attributable to water shortage due to deterioration of irrigation canal system, soil salinization and poor drainage system and others as mentioned in the preceding section.

3.3.4 Farm Inputs and Farming Practices

In the Study Area, a large-scale mechanized farming is predominant, because of the field plot is very large, and labor is less compared with the cropped area. Due to shortage of budget for farm input, however, almost all farms can not repair or renew farm machinery, and as a result the farms can not cultivate all the farm land even in the irrigated condition due to shortage of machinery.

The cropping season of summer crops starts in middle to late April and lasts to the end of September. Since the cropping season is limited, a staggering period of all the work operation should be less than 30 days. Due to shortage of agricultural machinery and disturbance of water supply, however, sometimes farm management can not be adequately carried out and staggering period of work operation becomes longer than 30 days.

Seeding of paddy starts in early May and harvest starts in early September. Spring wheat cultivation starts in late April and harvesting in late July to August. Winter wheat cultivation starts in September (after harvesting paddy) and ends in July.

Paddy is planted by broadcast dry seeding method, just after seeding irrigation water is supplied at the depth of 10-15 cm. Then surface water is drained 7 days after seeding. After then the paddy field is kept in no water condition for 7 to 10 days and again water is kept in field at the depth of 10-15 cm until 20 days before harvesting. While, wheat is sown by drill seeding method with the interval of 10-15 cm. Lucerne is sown with wheat and kept in the field for three years, and harvested three or four times a year. Therefore, in the first year, lucerne cultivation is carried out in the manner of mixed cropping with wheat. Lucerne is sown

on 10 to 14 days later than seeding time of wheat. Supply of water and fertilizer for lucerne is done 7 to 10 days after harvesting.

In almost all the area, paddy based eight years system or six years rotation system is employed, to keep the soil fertility and to prevent the accumulation of salts on soil surface. All the upland crops are planted after paddy cultivation and after upland crop cultivation paddy cultivation is carried out.

The quantity of farm inputs and labor requirements for major crops cultivation are shown in Table E-4. Since the completely mechanized cultivation is employed in the area, the labor requirement is very low; only 37 man-hours/ha for paddy cultivation, 21 man-hours/ha for wheat cultivation, 26 man-hours/ha for maize cultivation, 29 man-hours/ha for lucerne cultivation. In recent years, due to absence of guaranteed price supports and inputs from the state, declining trade with Russia, high interest rate on credit for input farms are facing an economic crisis, and as a result they can not afford to buy the proper quantities of chemical fertilizers and agro-chemicals and other input, and to maintain agricultural machinery adequately. Therefore, an actual amount of chemical fertilizer application of chemical fertilizer in recent years is much less than that of ordinary years, and the labor requirement is increased because of low efficiency of agricultural machinery due to inadequate maintenance.

3.3.5 Crop Yield and Production

The yield of major crops in the Study Area in 1995 is shown in Table E-5 and summarized below:

	(Unit: t/ha)			
Raion	Paddy	Wheat	Vegetables	Lucerne
Syrdarya	1.70	0.55	2.33	2.23
Terenozek	2.32	0.82	6.41	1.78
Zhalagash	3.01	0.75	5.12	1.65
Karmakshy	2.94	0.52	7.70	2.38
Average	2.71	0.67	6.00	1.89
Kzyl-Orda Oblast	2.08	0.56	4.16	2.24

Source: National Statistics Agency

Note: Vegetables include potato and melon

The above mentioned yields are very low, and there is a big difference in the yield of some crops from raion to raion. The yields of paddy and vegetables in Syrdarya Raion is much less than those in other raions. While, there is a little differences in the yield of wheat and lucerne among the raions. The yields of paddy, wheat and vegetables in the Study Area are higher than the oblast averages those crops, while the yield of lucerne in the Study Area is lower than the oblast average yield of lucerne.

	(Unit: t/ha)			
Year	Paddy	Wheat	Vegetables	Lucerne
1993	4.43	1.11	4.66	2.87
1994	3.09	0.79	6.54	2.20
1995	2.71	0.67	6.00	1.89
1996	3.68	0.47	9.48	2.91

Source: National Statistics Agency

Note: Vegetables includes potato and melons

The yield of major crops except vegetables largely decreased during the period from 1993 to 1995 as shown in the following table. The ratio of major crops yield in the Study Area in 1995 to those of 1993 are 61% for paddy, 60% for wheat and 66% for lucerne, respectively. The reason of the decrease of yield is mainly attributable to the less application of agricultural input and delay of planting and harvesting.

The amount of production of major crops in the Study Area in 1995 is shown in Table E-6 and summarized below:

(Unit: ton)				
Raion	Paddy	Wheat	Vegetables	Lucerne
Syrdarya	1,540	340	70	1,940
Terenozek	17,890	3,050	4,870	9,830
Zhalagash	25,580	3,730	5,480	16,360
Karmakshy	18,960	2,720	3,390	13,290
Total	63,970	9,840	13,810	41,420
Kzyl-Orda Oblast	142,770	28,880	52,860	152,390

Source: National Statistics Agency

Note: Vegetables include potato and melon

The following table shows the production of major crops in recent four years of 1993 to 1996.

(Unit: ton)				
Year	Paddy	Wheat	Vegetables	Lucerne
1993	125,480	13,200	14,030	62,520
1994	88,410	9,370	16,050	46,000
1995	63,970	9,840	13,810	41,420
1996	79,490	2,910	32,990	39,080

Source: National Statistics Agency

Note: Vegetables include potato and melon

The amount of paddy production has largely decreased till 1995 due to the decrease in planted area and yield as mentioned before. The amount of paddy production in 1995 was less than 50% of that in 1993, and the productions of wheat and lucerne in 1995 were 75 % and 67% as compared with those in 1993, respectively. The production of vegetables had not changed much. In 1996, when the farm were completely free from the "state needs" and could actually decide their cropping pattern themselves, the amount of production of major crops drastically changed compared to 1995. The production of paddy and vegetables production increased but that of wheat decreased, while the production of lucerne was not changed.

3.3.6 Post Harvest and Processing

The main agro-processing activity in Kzyl-Orda Oblast is rice milling. In addition to the large rice mill in Kzyl-Orda town, JSC "Akmazhan", there are 73 small rice mills in the agricultural enterprises (farm) in the Study Area, and one in each raion. Of the raion rice mills, only one in Zhalagash is presently operating.

The large rice mill in Kzyl-Orda, JSC "Akmazhan", has a capacity to process 700 tons of paddy per day. Before dissolution of Soviet Union, this mill processed 220,000 tons of paddy over a ten month. In 1995, the mill processed 45,000 tons of paddy. Small rice mills in the farm have a capacity to process 3 tons of paddy per day. Only a new rice newly established rice mill (German made) in Shagan Farm has a capacity to process 20 tons of paddy. A new rice mill, with a capacity of processing of 50 tons of paddy per day, is also under construction in Shagan Farm.

Except newly built rice mill, the break down of the product from paddy at the present is as follows:

50%: First class rice (12% broken rice)

12%: Crashed rice

15%: Mealy fodder

20%: Husks

3%: Paddy wastes

The standard for international market rice price is Thai, 5% broken and the normal international standard for recovery of milled rice from clean paddy is 64 - 66%. The new rice

mill in Shagan recovers 65 % of first class rice(6% broken rice) from clean paddy. The quality of rice is almost same as Thai, 5% broken rice.

Akmarzhan has an elevator storage capacity for 83,000 tons. Each raion has its own storage. The total storage capacity in the oblast not including on-farm storage is 533,800 tons, of which 214,300 tons are in elevator. Also, each farm has own storage, total capacity of on-farm storage is approximately 150,000 tons

There are six wheat flour mills, and 41 mini mills in agricultural enterprises (farm) in Kzyl-Orda Oblast. Capacity of mini flour mill in farm is 0.2 - 0.5 ton per day. Since the amount of production of wheat is very low compared with paddy, almost all of wheat produced in the oblast is consumed within the oblast. Wheat and wheat flour are not exported from the oblast.

There is no plant for processing vegetables, melons or fruit in Kzyl-Orda Oblast. Some home industries preserve dry melons or make jelly.

No meat products are exported from the oblast. The former state meat factory is closed down. Farms slaughter their own animals. There are 10 sausage factories in Kzyl-Orda Oblast. The Karaozek farm, which is situated in Terenozek Raion but out of the Study Area, operates a slaughter house and sausage factory. In addition to its own production, the farm purchases livestock from Shimkent and Kzyl-Orda farms for fattening and slaughter. The output from the farm is contracted to JSC "Yuzhneftigas"

The slaughter house and sausage factory were built in 1992 by Koch, a Kansas City, USA based firm. Originally it was a self financing company, which failed, and facility was taken over by the "Karaozek" Farm in 1995. The slaughter house has a capacity of 2 tons of meat per day, but currently produces 600 to 1,000 kg per day. The intake capacity is 20 cattle, or 150 sheep, or 40 pigs per day. The output capacity of sausage factory is 1,000 kg a day, although current operations are for 500 - 600 kg a day. Six kinds of sausage are produced.

There is a big milk factory in Kzyl- Orda city and three small dairies in the farms, however, their activity is very low compared to their capacity due to lack of material.

3.3.7 Animal husbandry

Animal husbandry is also one of the main agricultural activities in the Study Area. The 1995 animal population in the Study Area is shown in Table E-7 and summarized below:

	(Unit: head)						
	Cattle	Milk Cow	Sheep*	Pig	Horse	Camel	Poultry
Syrdarya	3,650	1,730	28,710	30	1,680	510	2,080
Terenozek	12,750	5,150	39,210	310	3,230	1,020	13,730
Zhalagash	19,530	8,570	47,320	130	7,300	900	21,530
Karmakshy	10,890	4,920	35,670	460	2,330	1,080	12,390
Total	46,820	20,370	150,910	930	14,540	3,510	49,730
KzylOrda	166,730	83,710	820,770	14,660	83,710	21,490	219,540

Source: National Statistics Agency

Note: *: Sheep and goat

In Kzyl -Orda Oblast and the Study Area, cattle, sheep and goat are the important animals, in 1994 animal population drastically decreased and then animal population is not change up to beginning of 1997.

	(Unit: head)						
	Cattle	Milk Cow	Sheep*	Pig	Horse	Camel	Poultry
1993	65,450	23,520	345,840	1,650	19,380	4,160	na
1994	51,340	20,700	173,720	1,200	16,570	3,760	41,000
1995	46,820	20,370	150,910	930	14,540	3,510	49,730
1996	45,940	18,790	132,040	840	14,030	3,170	64,910
1997	48,230	17,840	146,540	900	13,790	2,640	61,560

Source: National Statistics Agency

Note: *, Sheep and goat

The livestock population in the Kzyl-Orda Oblast by farm categories is shown below.

	(Unit: head)									
	Cattle		Milk cow		Sheep and goat		Horse		Poultry	
	Farm	Individual	Farm	Individual	Farm	Individual	Farm	Individual	Farm	Individual
1994	61,190	121,230	17,180	66,340	670,680	308,360	60,990	22,530	40,180	143,090
1995	43,990	122,740	9,670	69,050	517,850	302,917	34,800	24,622	49,560	169,980
1996	24,210	139,450	6,920	71,000	303,040	357,860	21,650	34,362	40	189,360
1997	11,380	155,030	3,730	70,360	208,650	539,440	15,770	40,940	9,700	205,450

Source: National Statistics Agency

"Individual" includes peasant farms & "Farm" individuals. Farm includes former state farms and production Cooperatives

After 1994, animal population in the farm is decreasing year by year, while those of peasant farm and individuals are increasing. In 1994, the ratio of the number of animals fed in the farms to those of total is 34% for cattle, 21% for milk cow, 69% for sheep and goat, 73% for horse and 28% for poultry, respectively. This ratio changed to 7% for cattle, 5% for milk cow, 28% for sheep and goat, 28% for horse and 5% for poultry in 1997. Poultry feeding is carried out by peasant farm and individuals. As mentioned above, peasant farms and individuals will play a important role in livestock production.

In the Study Area, a large number of ruminant animals are bred, and therefore a large amount of grasses are required. Since grasses in grazing land are not available to animals in winter, a large amount of crude fodder should be stored in summer for winter feeding. Therefore, a large farm area is required for fodder production. At present, one third of farm area is being used for fodder production.

3.4 Present Conditions of Agro-Economy

3.4.1 Agro-Economic Background

The following background statement is summarized from a study on agriculture sector market reforms by Abt Associates, Inc., funded by the Asian Development Bank (ADB).^{4/}

Liberalization of agriculture began in 1991. The farm gate price of grain in that year was 6% of the Kazakstan border price derived from international market prices. The first phase of the economic transition in 1991-93 saw the privatization of 292 state-owned agro-industrial enterprises that engaged in processing and marketing. A beginning was made to end the practice of state procurement based on the idea of state needs. In 1993, 60% of agricultural production was procured by the State, and 40% in 1994. About half the total grain procured was exported. Farm gate prices for grain rose to about 30% of world prices in 1993.

During the second phase of the transition to a market economy, 1993-95, the Government established 13 vertically integrated state-owned holding companies at the national level to ensure state control over processing, marketing and external trade in agricultural commodities. Each of these defacto monopolies consisted of a few hundred subsidiary

^{4/} Abt Associates, Inc., Study on Market Reforms in the Agriculture Sector, ADB TA No. 2448-KAZ, April, 1997, pp. 5-7.

enterprises. Their presence ensured the persistence of low farm-gate prices, adverse terms of trade to the sector, and persistence of abnormal trade practices, resulting in a wide price spread between producer and consumer prices amounting to an implicit tax paid by both producers and consumers.

The transfer of ownership of state and collective farms to private entities began in 1993. Of the 2,055 state farms and 430 collective farms, the ownership of 1,363 was transferred by the end of 1994. An additional 306 farms were transferred in the first half of 1995. By the end of 1996 (phase three) the production sector had been effectively privatized. The basic mode of transfer involved establishment of ownership modes making former workers and managers stock holders. They assumed both assets and liabilities of these firms.

The "state needs" procurement system was abolished for all agricultural commodities in early 1995. Grain could be sold through open auction. Farm gate prices began to rise. The pricing regime for agriculture products was relaxed. In mid 1995, the farm gate price for grain was 50% of world prices. The subsidy on retail bread prices was ended in 1994. Controls on food price markups were ended in April 1995.

Beginning in 1995, foreign trade was substantially privatized. Export quotas and restrictions and export tariffs were abolished or transformed. Grain exports were now to be supervised by the Kazak Agro-Industrial Exchange (KAIE), which sought to increase competition in the grain market. On the import side, liberalization has also been significant. Import licensing requirements were abolished and a VAT imposed replacing tariffs. Also established in 1995 was the National Price Commission that set mandatory export prices in order to stabilize foreign exchange losses. This practice ended at the end of 1996. In mid-1996, auction prices for grain approached and then exceeded world prices.

Beginning in 1996, the GOK decided to include the privatization of agro-industrial companies to promote a more competitive market environment in the sector. By mid-1996, this transformation had been accomplished. Among the most prominent of these was the privatization of "Astyk", which controlled 31 grain elevators. Reforms in input marketing and input prices have been substantial. Users will be required to pay for inputs from now on, whereas farms traditionally were not expected to pay for inputs. Since 1993, farms have had to pay for inputs, especially fuel. Being cash poor due to the reforms, most had to buy on credit from the state-owned suppliers. By late 1994, farmers had accumulated huge debts.

This led to the establishment of the Agricultural Support Fund (ASF) in December 1994. One of its actions was to reintroduce direct budget subsidies into agriculture. These continued through 1996, when they were officially ended together with support prices for wool and meat products. However, the ASF's 1997 budget has reinstated input subsidies and even expanded upon them. The policy represents a retrograde step in the reform process and will certainly add to the fiscal burden born by the GOK.

3.4.2 Marketing and Prices

Farmers of the Kzyl Orda Oblast did not benefit fully from the unregulated market prices in 1996, because much of their paddy production was committed to repay loans from the food production corporation "Astyk", and the fuel supply company "Yuzhneftigas" at prices ranging from US\$249 to US\$195/ton for paddy of first to third quality. Altogether in 1996, farmers were obligated to return 105,500 tons of paddy to Astyk, of which 55,000 tons was for the "State Resource"^{5/}, and the remainder for debts to "Yuzhneftigas", city government tax, and the electric company.

There are six wheat flour mills in the Oblast, and 41 wheat flour mini-mills in agricultural enterprises. Wheat and flour are not exported from the Oblast.

^{5/} Grain procured for State Institutions such as schools, hospitals, also, maybe export. A few years ago this was called "State Needs", which farms were required to supply according to quotas assigned by the State.

Most trade in melons, and vegetables is by private commission dealers (truckers) who load up direct in the fields and haul the produce to urban markets. The JSC "Kokonis" renewed operation in 1996, trading in melons, potatoes, carrots, and onions in a small way. Prior to independence, Kokonis sent 60,000-65,000 tons of melons annually to markets in the Soviet Union. In 1996 Kokonis sold 1,000-1,500 tons of melons to CIS countries. The Company also bought carrots and onions from Kzyl-Orda farms for urban markets. Onions are sold to North Kazakhstan. Potatoes are purchased in North Kazakhstan and Russia for sale in Kzyl-Orda markets.

No livestock or livestock products are exported from Kzyl-Orda except for hides. The former State meat factory closed two years ago for lack of supply. Farms slaughter their own animals and sell meat in the urban markets. There is a "big" livestock market in Kzyl-Orda operating on Wednesdays and Sundays. On Wednesday October 1996 there were an estimated 30 horses, 150 cattle, and 200 sheep offered for sale. Most milk is sold directly in the urban markets as raw milk.

Kzyl-Orda Oblast has a new agricultural Commodity Exchange, "Tabys" that has been in operation since February 1996. The Exchange was organized under initiative of the Oblast Administration for protection of the commodity producers and consumers. The main commodities included in Tabys are fuel, salt, rice, wheat and skins.

Average prices received by Kzyl Orda farmers in 1996 as determined by the Oblast Agriculture Management Department are summarized below.

Commodity	Tenge/kg	US\$/ton*
Paddy	10.8	159
Vegetables	8	118
Potatoes	13	191
Melons	3	44
Beef, live wt.	32	470
Mutton, live wt.	28	412
Milk	23	338
Lucerne **	2	27

* Exchange rates: 1996 \$1=68 Tenge, 1997 \$1=75 Tenge.

** August, 1997 price of 30 Tenge/15 kg bale.

Source: Kzyl Orda Oblast Agriculture Dept.

3.4.3 Agricultural Inputs Distribution

(1) Fertilizer

According to the Oblast Department of Agriculture, the fertilizer actual nutrient requirements for the 70,040 hectares of paddy sown in 1997 were 10,019 tons of nitrogen (N), and 6,813 tons of phosphorous (P). The actual amount applied by farmers to paddy land was 5,754 tons of nitrogen, and 4,383 tons of phosphorous, 60% of the total nutrient requirement. An additional 231 tons of nitrogen were applied to wheat.

Most of the mineral fertilizers used by Kzyl-Orda farms are supplied by the JSC "Kunarlylyk", formerly "Plodorodye".

There are a few small independent sellers of fertilizers who come from outside the Oblast, but, all fertilizers are supplied through this company, because they have specialized storage in the seven Raions. According to the Director of "Kunarlylyk", he supplied Kzyl-Orda Oblast with 35,000 tons of bulk fertilizer in 1997. This figure is corroborated by the data

from the Oblast Department of Agriculture which show 34,765 tons of bulk fertilizer were applied.

Kunarlylyk will try to supply 100% of the farmer's requirements next year, but, the problem is shortage of cash to pay manufacturers at the time of order. Kunarlylyk sells fertilizer to farmers as a barter exchange for paddy and buys from supply companies either in cash or barter of paddy or rice.

Most of the fertilizers used in Kzyl-Orda are produced in Kazakstan. The most frequently used and least expensive source of nitrogen, ammonium sulfate, is from Karaganda. Nitro-Ammono-Phos is purchased from Aktau, Uzbekistan and Russia. Double phosphate is from Taras (formerly Dzhambul). Ammonium nitrate is imported from Russia and Uzbekistan. Potassium is also produced in Kazakstan, but, according to the Director of Kunarlylyk, it has not been applied to Kzyl-Orda soils for several years because it is not needed.

(2) Pesticides

Kunarlylyk also supplies the only two herbicides used in Kzyl-Orda Oblast, Fatzet and Basagran. Both are for post emergence application to paddy, and produced by the German Company BASF. Kzyl-Orda farmers do not use any insecticides, presently. In Terenozek Raion, Basagran was applied to 2,550 hectares and Fatzet was applied to 200 hectares in 1997. The application rates are 3 lit/ha for Basagran, and 2 lit/ha for Fatzet. According to the Oblast Department of Agriculture, herbicide treatment was required on 20,333 hectares out of 70,040 hectares sown (30% coverage) in 1997.

(3) Fuel

Gasoline and diesel fuels are supplied by the new Canadian company "Hurricane Petroleum Company" which bought out "Yuzhneftigas". This year, Shagan Production Cooperative exchanged paddy for fuel from Hurricane, at the price of T.14/kg of paddy. The farm also pays interest on the loan of fuel at an annual rate of 37% from May to November.

Data supplied by the Oblast Department of Agriculture on the exchange value of paddy for fuel are summarized in following table.

Item	1996		1997		% of Change (1997/1996)
	Tenge/ton	US\$/ton	Tenge/ton	US\$/ton	
Diesel	10,200	150	12,375	165	10
Gasoline	15,500	228	20,250	270	18
Paddy	17,000	250	15,750	210	-16

Note: Exchange rate; US\$1 = T.68 in 1996 and US\$1 = T. 75 in 1997

Source: Oblast Agriculture Department.

The farm labor force is presently under employed. Rural unemployment in the Study Area is in the range of 30 to 40% of the labor force. Wage for farm labor in Kzyl-Orda Oblast are shown in the following table:

Category	Tenge/day	US\$/day
Tractor Driver, Category 8	317.68	4.67
Tractor Driver, Category 7	294.38	4.33
Irrigator	183.63	2.70
Milkmaid	170.88	2.51

Source: Kzyl-Orda Oblast Agriculture Management

3.4.4 Crop Budgets

The financial crop budget for rice under 1996 conditions is shown in Table E-8. The price for paddy in 1996 was US\$230.37 per ton based on US\$250/ton reported for Class 2 by

the Agriculture Department, less 5% waste and 3% storage cost. The gross crop value in the budget also includes rice straw which has a nutritional value of 0.10 fodder units/ton. For comparison, oat grain has a nutrient value of one fodder unit. The value of a fodder unit is US\$136.30 which includes the net return from feeding dairy, beef and sheep livestock.

No costs for commercial fertilizers or chemicals were included in the crop budgets under 1996 conditions. The wage rate for labor was US\$4.33 per day for machine operations and US\$2.70 per day for irrigation and other hand labor. Depreciation and repair of tractors and machinery were based on 1996 prices for new equipment quoted by dealers in the Study Area. Depreciation was based on "normative standards" of the Ministry of Agriculture for machine life, capacity in terms of area coverage, and performance.

Twenty percent value added tax (VAT) was included in the price of everything purchased by the farm, and it was also charged on every sale. Farms are charged 20% VAT on sales, but, credited for VAT previously paid on production inputs.⁶⁷ The VAT tax on paddy in Table E-8 (US\$51.53) reflects this adjustment to the tax paid. A social cost tax for pensions amounting to 32 percent of the total wage bill is also included in the budget. The net return per ha is US\$186.

The most important crops in the Study Area are rice, lucerne, wheat, maize silage, safflower, vegetables and melons. The results of financial crop budgets under 1996 conditions are summarized below.

Crop	Gross Value (US\$)	Production Cost (US\$)	Labor Hours	Net Return (US\$)
Rice	602	417	37	186
Lucerne	129	159	29	-30
Wheat	134	236	21	-102
Vegetables	684	686	473	-2
Melons	533	356	200	177
Maize silage	122	302	24	-180
Maize grain	212	282	27	-70
Safflower	143	300	34	-157

Rice and melons are the only profitable crops. Net losses from the other crops are caused by very low yields.

3.4.5 Farm Budget

The budget for a 5,000 ha farm under 1996 conditions is shown in Table E-9. The cropping pattern representative of 1996 conditions is 27% paddy, 26% lucerne, 16% wheat, 4% maize silage, 2% safflower, 2% vegetables, and 1% melons. Fourteen percent of the crop land was abandoned, and 8% was fallow.

In addition to the VAT and social cost tax which were included in the crop budgets, a land tax was assessed in the farm budget at the rate of 100 tenge (\$1.47) per ha. Income tax was charged at the rate of 10 percent of profits which are determined based on sales minus production costs.⁶⁸

The net return from the 5,000 ha farm was US\$11,930, or about US\$2/ha. All of the crops except rice and melons lost money for the farm because of low yields.

The crop budgets included labor costs of US\$4.33 per day for machine operation, and US\$2.70 per day for irrigation and hand labor plus the social cost for pensions. The total cost

⁶⁷ Information on VAT, land tax and income tax is from the Agronomist, Project Implementation Unit, MOA, Almaty.

⁶⁸ Ibid.

of wages was US\$78,300 and the cost of pensions was US\$36,800 for the 5,000 ha farm. The number of workers reported from the farm survey averages one worker per 4 ha. Including US\$78,300 from wages and US\$11,930 of net farm income, the average return per worker under 1996 conditions was US\$72.

The farm budget does not reflect that farmers directly consume some of the production of the farm and they also exchange part of their farm production for other consumption goods or production inputs, thus reducing cash transactions, resulting in less value added tax and income tax than shown in the budget. Also the crop budgets include an annual charge for depreciation of tractors and machinery purchased at current prices, which the farms are not actually paying at the present time. Nonetheless, the results of this analysis indicate that farms in the project area are not producing enough income under present conditions to sustain the workers and their families living on them.

Table E-10 summarizes the results of the project area Household Survey with respect to family food expenditures and food consumption. The average size of household is 6.8 persons and the average expenditure for food in 1995 was T. 62,538 (US\$1,019). Most families did not report any consumption of vegetables, milk, or meat. Perhaps this is because they produce such food on their own plots and did not include it in their reply to the questionnaire.

3.5 Present Conditions of Agricultural Supporting Services

3.5.1 Agricultural Research and Extension

Agricultural research and extension are defined as the production and dissemination of new scientific agricultural information and new technologies through systematic means to reach farmers directly and thereby improve their production techniques and technologies in order to increase yields, reduce inputs, control pests and weeds, improve soils, maintain the ecology, maximize irrigation efficiency, improve labor productivity, rationalize marketing, and increase household income and welfare. This traditional understanding as used in most nations does not apply directly to the case of Kazakhstan.

Until 1994, there used to be 44 research institutes and experiment station under the Kazakhstan Academy of Agricultural Science, but these have been decreased to 32 in 1996. These research institute and experimental stations being managed under the management and coordination of National Academic Center for Agricultural Research at the national and oblast level, undertake research on agronomy and horticulture, animal husbandry, food science, agriculture engineering, agricultural economy, privatization and fisheries at present. The research institute had well-trained and skillful scientist before independence of Kazakhstan. At present, however, the research activities of the institutes have largely declined because of the budget cut and consolidation of institutes. In 1992 the total staff of the institutes was 8,037 including 2,579 scientist, and decreased to 4,759 including 1,902 scientist in 1997.

All the institutes carried out their research work under supervision and coordination of National Academic Center for Agricultural Research. The research on the food crops and fodder crops production are carried out under coordination of Kazak Research Institute of agricultural Science (in Almaty) and Science Industrial Unit "Kokshetau". Kazak Research Institute of agricultural Science organizes and coordinates the research on food crops and fodder crop production in the southern region of Kazakhstan while Science Industrial Unit "Kokshetau" in central and northern Kazakhstan.

Of the above 30 research institutes, there is a research institute in Kzyl-Orda Oblast, Pre-Aral Scientific Research Institute for Agro-Ecology and Agriculture. The major activities of the institute are as follows:

- Breeding of paddy and adaptability trial of major crops including vegetables,
- Conservation of soil fertility,
- Seed production major crops,

- Agro-economics,
- Land tenure,
- Animal husbandry, and
- Information.

The agricultural sector is placed under a difficult transition from command economy to market economy, in which all the agricultural information was managed centrally at the raion, Oblast and national levels with production targets set centrally based on that information. The monopoly was possible because the state had relatively few farming and agro-processing enterprises, all of which were responsible to regional and national departments of agriculture. This comprehensive and rigid system of information management had collapsed in the emerging market economy. The links between the Ministry of Agriculture (MOA) and former state farms have weakened since the MOA is no longer providing financial supports, and state quotas have been eliminated, because former state farms have been subdivided into new and smaller farm units.

Extension service to farmers, which are carried out by the extension workers as known in the western countries, do not exist in Kazakstan. During the Soviet Period, research findings regarding new varieties and improved cultural practices were distributed to Oblast and Raion Department of Agriculture. These findings were issued in the form of report and pamphlets. Occasionally, research findings are published in scientific journals such as the *Agricultural Bulletin of Kazakstan*. These scientific journals are not regularly read by farm managers and specialists.

Ministry of Agriculture is responsible for agricultural extension, training and network of training program. Department of Agriculture distributes these information to farm managers and specialists of farms mainly by means of pamphlets. The specialists stationed in the farm just provide the above information to the workers in the farm without particular training. Various research institutes arrange the agricultural demonstration sites or training course for farms in cooperation with Ministry of Agriculture. However, the linkage between research and extension activities is very weak, because of the National Academy of Sciences is responsible for only agricultural research, and is independent from the Ministry of Agriculture. In addition, the present system of agriculture extension and training is only for farms, while there is no extension or training system for private farmers.

3.5.2 Agricultural Credit

"Agroprombank" is the only source of agriculture cash loans for farmers in the Kzyl-Orda Oblast except the special state fund loans to small farmers which are described later. Agroprombank is a private bank, with funds generated by deposits and returns on loans. The bank has 6,225 staff and 236 branch offices. As of January 1, 1996, Agroprombank had T.6.9 billion in assets and credit investments totaling T.2.3 billion. The Kzyl-Orda Branch has outstanding loans of T.200 million as of the 1st of August 1997, which are broken down as 40% for agriculture, 20% for industry, 30% for small business, and 10% for other. All of their loans are short term, one year or less. The interest rate on loans is 30% in 1997, compared to 45-50% in 1996.

Agroprombank requires 150% collateral on the value of their loan. If a farmer fails to pay when the loan is due, the bank will take possession of his paddy and other collateral and sell it to satisfy the loan. Loans must be repaid in cash, not barter.

There are no other bank sources of cash credit available to Kzyl-Orda farmers. Barter credits in exchange for paddy are made by "Hurricane Petroleum Company" for fuel, JSC "Agropromtekhnic" for tractor and machinery spare parts, and JSC "Kunarlylyk" for fertilizers and pesticides.

In December 1994, the Kazakstan Government created the State Fund for Financial Support of Agriculture to improve the economic condition of private farms. The fund is

administered by the Ministry of Agriculture. Out of T.85 million of Kzyl-Orda farm debt due to this fund on December 15, 1996, 60% was paid. T.34 million in arrears was carried over to 1997 and the total amount due for payment on December 15, 1997 is T.105 million. The total remaining debt of Kzyl-Orda farms to the State Fund is about T.150 million, a relatively small amount compared to the total debt of T.6 billion owed by all Kazakstan farms.

3.6 Agricultural Development Plan

3.6.1 Basic Concept for Agricultural Development

Although there has been a high agricultural potential in the Study Area, agricultural production has stagnated at a low level and shows a decreasing tendency during recent few years. For agricultural production which is product of yield and planted area, one of the most important factor is irrigation and drainage system which affects the planted area. It is therefore understood that the timely supply of water and timely drain could be prerequisite for the development of sustainable agriculture in the area. Apart from the water supply system, it could be understood that the present farming practice, supporting activities and marketing system would have some space to be improved in order to raise the agricultural production and farm and farmer's income level through the establishment of productive and advanced agriculture and modern marketing system in the Study area.

The agricultural development plan would be formulated based on the following concepts:

- (1) to remove and /or improve the present constraints for agricultural production,
- (2) to formulate the reasonable cropping pattern and proper crop rotation to maximize the crop production,
- (3) to establish the improved and practicable farming practices to realize the proposed cropping pattern and yields,
- (4) to improve agricultural supporting system such as extension service and agricultural credit system, and
- (5) to improve or establish farmer's organization for crop production, credit and marketing.

3.6.2 Farm Household and Agricultural Labor Force

Based on the result of farm survey done under the sub-let contract, the average farm size and the family size as well as the labor force per household in the Study Area are estimated as follows:

	Syrdarya	Terenozek	Zhalagash	Karmakshy	Average
Average Farm Size (ha/household)	8.9	18.9	17.9	21.0	15.9
Average Family Size (persons/household)	5.9	6.1	6.2	6.0	6.1
Average Labor force (men/household)	2.7	2.8	2.9	2.8	2.8

According to the Kzyl-Orda Statistics Office, the population of the four raions concerned remains steady from 1994 to 1996 due to both higher death rate and emigration. The labor requirement is expected to decrease under future "without project" condition, because of reduction of irrigated area as mentioned in Sub-section 3.3.2. As a result, number of emigrant from the Study Area will increase. Under future " with project" condition, however, the labor requirement would increase after implementation of the project, because of increase of the planted area , though slightly. As a result, the emigration would be restrained to some extent, and the present labor force mentioned in the above will not be much changed in future.

The present labor requirement in the farming practice is very low, since completely mechanized cultivation is being employed in the Study Area as mentioned in Sub-section 3.3.4. In future, the labor requirement under the "with project" condition will also be low. Therefore, the above average labor force per household would be enough to cover the labor requirement under the both present condition and "with project" condition.

3.6.3 Future Land Use

At present, there is 87,000 ha of the original rice rotation area, which includes 11,920 ha of presently abandoned area in 1995. Under "with project" condition, however, all the abandoned area will be recovered to the normal cultivation area, and all the rice rotation area will be used for crop production. On the contrary, under "without project" condition, the actually irrigated area will continue to decrease due to the increase of abandoned area, as shown below.

Raion	(Unit: ha)				
	1992	1993	1994	1995	1996
Syrdarya	2,850	2,940	3,130	2,780	2,450
Terenozok	22,920	21,480	20,831	20,830	18,070
Zhalagash	34,200	31,070	30,287	28,190	26,950
Karmakshy	25,210	25,450	24,440	23,280	20,220
Total	85,180	80,940	78,688	75,080	67,690

Source: Committee on Water Resource

The future decrease of the irrigated area is forecasted based on the above table and its result is shown in Figure E-3. According to the forecast, presently irrigated area will decrease from 75,080 ha in 1995 to 31,900 ha which is the average of the area to be decreased during the project life of 50 years and deemed to be the irrigation area under the "without project" condition. Based on the above study result, the future land use for both "with project" and "without project" conditions is estimated as shown in Table E-11 and summarized below.

Raion	(Unit: ha)					
	Without Project			With Project		
	Abandoned	Irrigated	Total	Abandoned	Irrigated	Total
Syrdarya	2,200	1,130	3,330	0	3,330	3,330
Terenozok	14,590	9,080	23,670	0	23,670	23,670
Zhalagash	23,370	11,030	34,400	0	34,400	34,400
Karmakshy	14,940	10,660	25,600	0	25,600	25,600
Total	55,100	31,900	87,000	0	87,000	87,000

3.6.4 Proposed Cropping Pattern

In forecasting the future agricultural situation under the "without project" condition, it is assumed that the irrigated area will decrease with an increase of abandoned area, and cropping intensity will also decrease in proportion to the irrigated area. Under the "with project" condition, however, all the abandoned area will be recovered to the normal agricultural land by improving the irrigation and drainage facilities, and all the original rice rotation area can be used for crop production.

For the establishment of profitable and sustainable cropping system, paddy, wheat, safflower, vegetables, melons maize for silage and lucerne are selected as the proposed crops after considering on the soil and climatic conditions, growth period, profitability, demand of food stuff, crop rotation, soil conservation, soil fertility and environmental balance. Particularly for the soil and climatic conditions, selection of crop is made in consideration of tolerance to salinity and to high temperature in summer. Then, the recommendable cropping system is established as shown in Figure E-4 taking into account the crop rotation, requirement of livestock feed, conservation of soil fertility and prevention of accumulation of salt on soil surface. As shown in this cropping pattern, rice based cropping system is employed for rotation of crops cultivation, and paddy cultivation area occupies about half of the cultivated area, because paddy is the most suitable and benefitable crop under this condition. In addition

to this, rice consumption could be expected to increase because of change in composition of population by races. Now, rice eating race (Kazak) is increasing and wheat eating races (Russian, German, etc.) is decreasing. Moreover, MOA recommends rice based cropping system (around 50% of total cropped area) in Kzyl-Orda and most of farmers intent to cultivate paddy in accordance with the result of interview survey. Lucerne is also important considering the soil conservation and animal food and will be cultivated in about 30% of total cropped area. Wheat is also important for food and its cultivated area is about 10 % of total cropped area. Other crops such as vegetables, melons and safflower are also necessary., and their cultivation area is 10% of total cropped area.

The planted area of each crops is shown in Table E-12 and summerized below both under "with project" condition and "without project condition":

(Unit: ha)

Crop	Syrdarya		Terenezek		Zhalagash		Karmakshy		Total	
	Without	With	Without	With	Without	With	Without	With	Without	With
Paddy	390	1,490	3,730	11,830	3,770	17,200	4,220	12,800	12,110	43,320
wheat	290	680	1,720	3,550	2,000	5,160	2,240	3,820	6,250	13,210
Safflower	10	70	140	710	150	1,030	170	770	470	2,580
Vegetables	10	50	200	470	210	690	140	515	560	1,725
Melons	10	50	200	470	210	690	140	515	560	1,725
Lucerne	410	820	2,410	5,930	3,970	8,600	2,940	6,410	9,730	21,760
Maize*	10	170	360	710	580	1,030	520	770	1,470	2,680
Others	0	0	320	0	140	0	290	0	750	0
Total	1,130	3,330	9,080	23,670	11,030	34,400	10,660	25,600	31,900	87,000

3.6.5 Anticipated Yield and Crop Production

Present yields of crops in the Study Area remain at relatively low level and fluctuated year by year due to shortage of farm inputs, irregular irrigation water supply, poor crop husbandry and inadequate cropping season, especially during the period from 1993 to 1995. The low yield of crops during period from 1993 to 1995 had largely been affected by drastic decrease of farm inputs. The past trend of the yield of crops does not show a definite tendency. Therefore, it is very difficult to forecast the future crop yield under "without project" condition from the past trend of crop yield. Considering such unusual crop yields in recent five years, it is not correct way to estimate the crop yields based on the present yields for the "without project" condition. Therefore, the average crop yield for the period from 1986 to 1995 is taken as the yield of crop under the "without project" condition for each crop.

After completion of the project work, the yields of crops will increase through timely supply of irrigation water, adequate drainage and employing improved farming practices. The yields of crops under the "with project" condition are estimated on the basis of the present technology level, research outcomes for the yield potential, crop yields of developed countries which are situated in the same latitude as that of Kazakstan (Table E-13). The anticipated crop yields thus estimated for the "without project" and "with project" conditions are shown below.

(Unit:t/ha)

Crop	Syrdarya		Terenezek		Zhalagash		Karmakshy		Total	
	Without	With	Without	With	Without	With	Without	With	Without	With
Paddy	3.51	6.00	3.76	6.00	3.84	6.00	3.72	6.00	3.76	6.00
wheat	1.07	2.50	1.16	2.50	1.19	2.50	1.14	2.50	1.16	2.50
Safflower	0.20	1.20	0.24	1.20	0.26	1.20	0.17	1.20	0.22	1.20
Vegetables	3.04	10.00	3.76	10.00	3.08	10.00	3.74	10.00	3.45	10.00
Melons	6.08	20.00	7.52	20.00	6.14	20.00	7.48	20.00	7.03	20.00
Lucerne	3.07	6.24	3.42	6.24	3.42	6.24	3.20	6.24	3.34	6.24
Maize*	15.45	30.00	15.64	30.00	16.67	30.00	15.88	30.00	16.13	30.00

Future crop production after completion of the Project is estimated on the basis of the proposed land use, cropping pattern and anticipated yields of crops. The anticipated production in the Project Area are given in in Table E-14 and E-15 and summerized below.

Crop	(Unit:ton)									
	Syrdarya		Terenozeck		Zhalagash		Karmakshy		Total	
	Without	With	Without	With	Without	With	Without	With	Without	With
Paddy	1,370	8,940	14,020	70,980	14,480	103,200	15,700	76,800	45,570	259,920
wheat	310	1,700	2,000	8,880	2,380	12,900	2,550	9,550	7,240	33,030
Safflower	0	80	30	850	40	1,240	30	920	100	3,090
Vegetables	30	500	750	4,700	650	6,900	520	5,150	1,950	17,250
Melons	60	1,000	1,500	9,400	1,290	13,800	1,050	10,300	3,900	34,500
Lucerne	1,260	5,120	8,240	37,000	13,580	53,660	9,410	40,000	32,490	135,780
Maize*	150	5,100	5,630	21,300	9,670	30,900	8,260	23,100	23,710	80,400

The amount of crop production under "with project" condition is about ten times of those under "without project" condition. An increase of the amount of crop production is largely attributed to an increase of cropped area.

3.6.6 Animal Husbandry

Animal population has shown a decreasing tendency since five years in the Study Area. This decreasing tendency seems temporary due to drastic change of the farm management system in the process of privatization, but again starts to increase from the completion of privatization in early 1997. However, this increase will not be more than those in early 1990's, because the producing capacity of pasture land and marketability of livestock will be almost same as the present condition in future. In this study, therefore, it is assumed that the animal population in the Study Area will not change from the 1990's level for both "without project" and "with project" conditions.

3.6.7 Agricultural Supporting Services

(1) Agricultural Research

The government's tight budgetary condition seriously and adversely affects the activities of all the agricultural research institutes and actively has become quite limited. Accepting this condition as it is, the research activities should, within a limited budget, selectively focus on not only the development of technologies to solve the agricultural constraints faced by farms, but also the improvement of social, managerial and economic situation of farms and farmers.

The recommended research activities include, in particular, breeding of high yield and high quality varieties, production of high quality seeds, improvement of farming practices, soil fertility, post-harvest techniques and improved water management. Research on environmentally sound farming practices would also be necessary to improve the present environmental conditions in the Study Area including the deterioration of water quality, soil, and desertification. With regard to the improvement of social and economic situation, research priority should be given to the improvement of marketing system, land tenure and land holding, credit and farm economy.

In addition, a strong linkage among the agricultural research institutes, agricultural policy division and extension divisions needs to be established for the distribution and transfer of newly developed technologies.

Within the Study Area, the Demonstration Farm can be used as a local site for illustrating improved new variety and new cultural practices developed by agricultural research institutes.

(2) Agricultural Extension and Farmers' Training

Under command economy, agricultural extension was non-existent as such. Since information and decision making was centralized, the need for participatory training for farming in market economy was nil. Thus one key challenge of the transition in the Study Area is to create an agricultural extension program which is matched to the needs of a market economy. In market agriculture, accurate and timely information as well as relevant and current training are crucial to competitiveness and profitability. Such information and training is non-existent in the Study Area. Farm workers and peasant farmers have none of the skills in farm management, marketing, agricultural economics, water management, business planning, accounting or legal environment with which to complete effectively. As farms continue to evolve into different organizational forms of various sizes, it will be crucial to conceptualize agricultural extension as something which is extended to individuals rather than to farms; that is to say, that training and information must be directed not toward large units and their managers and specialists, but toward all of those involved in the rapidly changing agricultural enterprise. The improvement for agriculture training is developed in sub-Section 4.6.8.

(3) Agricultural Credit

The plan includes an agricultural credit program to make short term farm operating loans and mid-term loans to project farms for the purchase of tractor and farm machinery. The credit program could be managed by established commercial bank in the Kzyl-Orda Oblast.

However, there may be a problem finding a suitable bank carried out by consultants to the Asian Development Bank, serious deficiencies were found with regard to Agroprombank such as to preclude installing any type of term lending program in the bank without significant technical assistance.

The deficiencies of Agroprombank include the following:

- (i) Based on April 1996 audit report of National Bank of Republic of Kazakstan (NBRK), adversely classified assets (non-standard to loss) represent 48% of the total credit portfolio of T. 2.28 billion. Loans classified as loss represent 37 % of the portfolio.
- (ii) The bank is short T. 738 million in unfunded reserves.
- (iii) The bank has an excessive amount of bad loans and poor quality lending practices.
- (iv) The bank has no set formula for loan pricing and lack of knowledge concerning the cost of funds.
- (v) Reported net income for the first quarter of 1996 was T. 40.7 million, which was a 70% decrease from 1995.

Concerning bank management, the report acknowledges several improvements in the past year such as 24% reduction in staff, and implementing system for monitoring costs of oblast branches, but concludes that the bank has poor earnings, weak financial health, weak management and an excessively high rate of default on its loan. This report is pessimistic as to the likelihood of the bank becoming a viable institution capable of responding to rural credit needs over the next few years.

Narodny Bank, the former State Saving Bank, is viewed more favorable by the consultants as being able to reach a large percentage of rural population through its existing outlet network and thus able to provide a range of financial services. There are 12 branch offices of Narodny Bank in Kzyl-Orda city and 9 branch offices in the Raions of Kzyl-Orda Oblast.

Narodny Bank is still 100% owed by the Government of Kazakstan. Its primary purpose was to attract personal savings from individuals and make social payments to citizens. As of April 30, 1996 the Narodny Bank controlled 53% of total bank deposits in Kazakstan, including 76% of demand deposits, 36% of time deposits and 35% of foreign currency deposits.

Based on the April 1996 audit report of NBRK, adversely classified assets (non-standard to loss) comprise only 6% of the bank's total credit portfolio of T. 8.1 billion and unfunded reserves were short by T. 246 million. Reported net income for the first quarter of 1996 was T. 477 million, 97% higher compared to the second quarter of 1995.

However Narodny Bank currently makes loan only for the short term, less than 3 months. The consultants found several deficiencies in lending procedure, such as undue outsider influence on the flow of funds, and concluded as in the case of Agroprombank that they could not recommend installing any kind of term lending program in the bank without significant technical assistance being provided prior to start up of the lending program.

Performance of these banks may improve prior to the implementation of the Kzyl-Orda Irrigation/Drainage and Water Management Project, so that it will be possible to manage the farm credit component through branches of one or both banks.

3.6.8 Marketing and Prices

The conceptual basis for the marketing plan includes the major elements of quality, product, fair price, and reasonable credit.

It was noted earlier that the recovery of rice from paddy at the main Kzyl-Orda rice mill, "Akmarzhan" is only 50%, compared to the international norm of 64-66%. Also, the 1st quality rice from this mill is 12% broken, compared to the international market price standard of Thai, 5% broken. On the international market, because of poor milling, Kzyl-Orda rice would be judged to be 3rd or 4th quality, meaning it probably would not sell outside the CIS or Russia, and there is a severe quality discount to the price.

Possible ways to improve marketing in the Study Area include formation of a marketing cooperative. This cooperative would include new rice milling facilities, and marketing services, such as seeking buyers, and handling and selling members' products. The cooperative could also provide credit to members for purchasing production inputs at a reasonable interest rate. The cooperative belongs to the members, so all profits accrue to the members in proportion to their share of sales.

With respect to marketing crops other than rice under with project conditions, Kzyl-Orda Oblast is deficit in production of wheat, vegetables, milk, and vegetable oils in terms of meeting the consumption requirements of its own population. Increased production of fodder from the project would be used to produce more dairy products and meat for local consumption.

Increased wheat production would most likely be milled into flour and consumed locally. However, if production of wheat in the future should exceed oblast requirements, the surplus can be shipped to Russia at a cost of about US\$21/ton; much less than the cost of shipping wheat from US or Canadian ports.

Vegetables would most probably be sold through local markets for consumption within the oblast. However, if higher yields could be achieved, there is a good market for surplus production in North Kazakstan and Russia.

Other than rice, the most promising crop for future development of an export market is melons. Kzyl-Orda melons have a reputation for sweetness and flavor. In the past, 60 to 65 thousand tons were exported to Russia by the Kzyl-Orda firm "Kokonis". The Russian market

could be restored with the increased supply of about 28,000 tons of melons projected to be available under "with project" conditions, provided shipping time to Russia is reduced in order to prevent excessive spoilage losses.

Production of safflower is projected to increase from 280 tons of seeds annually "without project" condition to 3,080 tons "with project" condition. Presently, the nearest mill for extracting oil from the seeds is in Shinkent, a distance of about 500 km. At a 40% recovery factor, the annual production of safflower oil from the project will be about 1.23 million liters. The average household consumption of edible oils reported from the farm survey was 9.5 liters per month, or 1.4 liters/person. At this rate of consumption, the project will produce enough oil to supply the annual requirements of about 73,000 people. The increase in vegetable oil production from the project will probably be consumed within the oblast. Any surplus can easily be sold elsewhere in Kazakhstan because edible oils are a major agriculture import.

4 The Feasibility Study on the Priority Project

4.1 Location and Administration of Priority Development Area

The Priority Development Area (the Project Area) is located in the Terenozek Raion of the Kzyl-Orda Oblast at 55 km west of the oblast capital of Kzyl-Orda. The Administrative center of the raion, Terenozek town, is located 13.3 km north of the Project Area on the major national east-west high way and railroad line. Two major farms in the Project Area, Ilyasov Production Cooperative (398 households) and Shagan PC (688 households), adjoin each other and are situated on an asphalt road south of Terenozek town. The Berlek Peasant Farm (56 households) is situated in the heart of Ilyasov Area. The Abouy Zhaksylyk Peasant Farm (3 households) and four Peasant Farms (Ilyas, Meras, Murat and Bebit - each 1 household) are located in within the boundary of Shagan Area.

4.2 Population and Labor Force

The Kazakhstan Census Bureau estimates the population of Kzyl-Orda Oblast at 676,800 for October 1996. Urban population is 64% and rural population is 36%. The Terenozek Raion, which encompasses the Project Area, has a total population of 29,700. In the Project Area, 97.5% of the population is Kazaks; the remainder is Russian, Korean, German, Chechen and Kalmik. Following table shows the population in the Project Area.

Location	Total	Male	Female	Children (<16)
Ilyasov Area				
Ilyasov PC	2,062	1,044	1,018	741
Berlek PF	233	122	111	90
Subtotal	2,295	1,166	1,129	831
Shagan Area				
Shagan PC	3,730	2,043	1,687	1,037
Ilyas PF	15	8	7	5
Meras PF	5	3	2	2
Murat PF	7	3	4	1
Bebit PF	8	5	3	3
Abouy PF	18	8	10	6
Subtotal	3,783	2,070	1,713	1,054
Total	6,078	3,236	2,842	1,885

Note: PC, Production Cooperative; PF, Peasant Farm

Source: Ilyasov and Shagan Production Cooperatives and Farm Survey

Labor activity in the Terenozek Raion is primarily in the agricultural sector and currently experiences low level of official unemployment. The Kzyl-Orda Statistics Department reports that there are currently 17,400 persons employed in the raion and 906 registered unemployed persons; the 1997 unemployment index is 5%. The Terenozek Raion Office of Labor Protection identifies 155 unemployed persons within the Project Area and an unemployment index of 4%. Actual unemployment is likely higher because not all unemployed

persons register for benefits. Unemployment benefits paid out to the unemployed in the Terenezek Raion in 1996 were T. 2 million and Terenezek Raion Office of Labor Protection reports that for unemployment compensation are lower this year than last, although they expect new claims to increase after the harvest season is over.

4.3 Present Conditions of Agriculture

4.3.1 Land holding and Land Tenure

All the state farms and collectives are privatized by the end of 1996 based on the legislative decree. All the properties had been allocated to employees of the former state farm by considering his post and longevity, however, land was still property of the state. During the period from January, 1997 to April, 1997, 80% of farm land has been equally allocated to all the individuals (more than 1 year old) living in the farm, including employees, pensioners and their family members, based on the Presidential Decree which was declared in December, 1996. Twenty percent of farm area is kept as a reserved land which is managed by raion administration. The village communal land is still managed by posyolok (village) administration.

There is a difference in the farm area per head among the former state farm, because there is a big difference in the population and farm area among the farms. The village communal land is still under management of village administration.

The Project Area encompasses a total area of 40,230 ha of which 13,690 ha are arable and 13,490 ha are pasture. The remainder consists of bush, swamp, building area, canals and roads. A portion of the total area (15%) is held in reserve for inheritance by the children of current shareholders (5,680 ha). The present land holding is shown below.

	Total	Arable land	Pasture	Others	Land per head
(Unit: ha)					
Ilyasov Area					
P C Ilyasov	8,930	4,620	2,980	1,330	4.7
P F Berlek	1,140	580	380	180	4.7
Raion Reserve	2,410	1,280	740	390	
Village Land	3,450	0	1,160	2,290	
Subtotal	15,930	6,480	5,260	4,190	
Shagan Area					
P C Shagan	12,471	5,457	4,157	2,857	3.2
P F Ilyas	50	49	1	0	3.3
P F Meras	39	5	34	0	9.8
P F Murat	50	45	5	0	7.1
P F Beibit	20	2	15	3	2.9
P F Abouz Z.	20	2	18	0	1.2
Raion Reserve	3,270	1,650	1,270	350	
Village Land	8,380	0	2,690	5,690	
Subtotal	24,300	7,210	8,190	8,900	
Total	40,230	13,690	13,450	13,090	

Source: Terenezek Raion, P C Ilyasov and Shagan, P F Berlek and farm survey

Note: P C: Production cooperative, P F: Peasant farm

The right of farm land belongs to the individuals in the Peasant Farms, however, in the Production Cooperatives it is temporarily entrusted to the farm manager.

4.3.2 Present Land Use

The present land use of the Project Area was clarified based on the 1:12,000 scaled land use map recently prepared by the Study Team based on the aerial photo (1997) and information collected from the Raion Committee on Land Resource and Management Committee and the

related farm (1997). The land use pattern has also been further confirmed through the field survey and analysis of agricultural statistics.

The present land use in the Project Area in 1996 is shown in Table E-16 and Figure and Figure E-5 and summarized below.

Land use Category	Ilyasov*		Shagan*		Total area	
	Area (ha)	Ratio (%)	Area (ha)	Ratio (%)	Area (ha)	Ratio (%)
(1) Agricultural land	11,740	74	15,400	63	27,140	67
O. R. A.**	6,480	41	7,210	30	13,690	34
Pasture	5,260	33	8,190	34	13,450	33
(2) Non agricultural land	4,190	26	8,900	37	13,090	33
Marsh	970	6	1,170	5	2,140	5
Shrubs	530	3	2,400	10	2,930	7
Canals and collectors	970	6	1,150	5	2,120	5
Roads and streets	190	1	190	1	380	1
Built up	120	1	420	2	540	1
Others	1,410	9	3,570	15	4,980	12
Total	15,930	100	24,300	100	40,230	100

Source: JICA study team Estimation based on the land use map

Note: *: Former state farm Ilyasov and Shagan, **: Original rice rotation area

The Project Area occupied an area of 40,230 ha, of which 27,140 or 67 % of total area is used for agricultural purpose including livestock grazing and hay making. While, the non agricultural land area is 13,090 ha which includes marsh and swamp, bush and forest, village, road, rivers, irrigation and drainage canals and desert.

The area ratio of agricultural land to the total and that of rice rotation area to the total are higher for Ilyasov Area than Shagan Area.

The original rice rotation area (original irrigation area) in the Project Area is 13,690 ha, 6,480 ha in Ilyasov Area and 7,210 ha in Shagan Area as shown below.

Land category	(Unit: ha)		
	Ilyasov	Shagan	Total
Original rice rotation area	6,480	7,210	13,690
Presently irrigated area*	3,530	4,960	8,490
Presently abandoned area*	2,950	2,250	5,200

Source: JICA study team Estimation based on the land use map

Note: * in 1996

According to the above table, 5,200 ha or 38% of the rice rotation area is abandoned by some problems in 1996, such as water shortage due to deterioration of irrigation canal system, soil salinization and water logging caused by poor drainage system and poor management of irrigation and other reasons such as delay of arrival of irrigation water to the field, worn-out agricultural machinery and shortage of agricultural input.

Following table shows the areas abandoned by respective causes.

Causes	(Unit: ha)		
	Ilyasov	Shagan	Total
Shortage of water	300	180	480
Salinity	400	300	700
Water logging	280	400	680
Others*	1,970	1,370	3,340
Total	2,950	2,250	5,200

Source: Production Cooperative "Ilyasov" and "Shagan" and Terenezek raion office

Note *: including worn-out agricultural machinery and shortage of input

In 1996, abandoned area (no planted area) is 5,200 ha, however it increased to 6,220 ha in 1997.

4.3.3 Cropping Pattern

As stated in Sub-section 3.3.3, since meteorological and soil condition is very severe for growth and production of crops only limited crops such as paddy, wheat, some vegetables and lucerne are mainly cultivated.

Of the original rice rotation area of 13,690 ha, 8,490 ha was used for crop production in 1996 as shown in Figure E-6. The planted area of each crop in and surround the Project Area in 1993 to 1997 are shown in Table E-17 and summarized below:

Planted area 1996

Crops	(Unit: ha)				
	Ilyasov	Shagan	Total	Terenozok	Kzyl-Orda
Paddy	1,500	2,000	3,500	10210	66,030
Wheat	440	1,700	2,140	3820	35,910
Lucerne	1,400	1,000	2,400	6930	62,730
Vegetables	190	170	360	1192	13,530
Other crops		90	90	937	5,400
Total	3,530	4,960	8,490	23,089	183,600
CI	0.56	0.70	0.63		

Source: Production Cooperative "Ilyasov and "Shagan" and National Statistics Agency

Note: Vegetables includes potato and melons CI: Cropping intensity

In the Project Area, paddy, wheat and lucerne are major crops, followed by vegetables (including potato and melons) and other crops area is very limited or negligible. The planted area of paddy occupies 3,500 ha or more than 40 % of total planted area. Wheat and lucerne areas occupy 2,140 ha and 2,400 ha, respectively. Vegetables are mainly cultivated in the kitchen garden and its area is 360 ha. In surrounding area of the Project Area, paddy is also a leading crop followed by lucerne and wheat. The cropping intensity in Ilyasov and Shagan Areas are 0.56 and 0.70, respectively, and 30-44% of original rice rotation area is not utilized for crop production in 1996.

Recently, the planted areas of major crops show a decreasing tendency. Total planted area in 1993 was approximately 13,330 ha and had decreased to approximately 8,680 ha in 1996. In 1997, the planted area has again decreased to 7,280 ha. Cropping intensity was 0.97 in 1993 and it decreased to 0.63 in 1996. The planted area of major crops from 1993 to 1997 are shown in Table E-17 and summarized below:

Year	(Unit: ha)						
	Paddy	Wheat	Vegetables	Lucerne	Others	Total	CI
1993	5,470	2,700	810	3,100	1,060	13,140	0.97
1994	5,170	2,500	680	3,200	1,010	12,560	0.93
1995	4,400	2,400	590	3,400	660	11,450	0.85
1996	3,500	2,140	360	2,400	90	8,490	0.63
1997	3,780	1,100	280	2,100	20	7,280	0.55

Source: Production Cooperative "Ilyasov" and "Shagan"

Note: Vegetables includes potato and melons

According to the above table, the paddy area has sharply decreased, while, a slight decrease is observed in the areas of wheat and lucerne during the period from 1993 to 1996. The planted area of minor crops is sharply decreased in the same period.

4.3.4 Farm input and Farming Practices

In the Project Area, a large-scale mechanized farming is predominant, because the field plot is very large, and labor force is less compared to the cropped area. Due to shortage of budget, however, the farms can not have enough spare parts for repairing and can not replace spoiled machinery, and as a result the cropped area is decreasing year by year. Following table shows a summary of the number of major agricultural machinery and their working conditions as of the end of 1996.

Item	Total	Condition			Needs urgent replacement
		Good	Fair	Poor	
Ilyasov					
Wheel tractor	39	34		5	5
Crawler tractor	24	18		6	4
Wheel combine harvester*	25	12	2	11	10
Crawler combine harvester	na	na	na	na	na
Shagan					
Wheel tractor	51	31	14	6	18
Crawler tractor	46	24	18	4	4
Wheel combine harvester	40	5	31	4	4
Crawler combine harvester	10	5	1	4	4

Source: Production Cooperative "Ilyasov" and "Shagan"

Note: *, includes crawler combine harvester

Many agricultural machinery are not in good condition, and average working year is nine. Especially more than half of combine harvester is not good condition and almost of them are now requested for replacement. According to farm interview, shortage of working hour of combine harvester becomes the limiting factor for determination of paddy cultivation area.

Operation and maintenance of agricultural machinery are carried out by maintenance service section of the farm by supervision of engineer. There is a work shop for maintenance of machinery where some qualified mechanics are working.

Cropping season and cultural practices of major crops is presented in Sub-section 3.3.4

The quantities of farm inputs and labor requirements for major crops cultivation are also presented in Sub-section 3.3.4

In recent years, due to absence of guaranteed price support and inputs from the state, declining trade with Russia, and high interest rates on credit for farm input, farms and farmers are facing an economic crisis, and as a result they can not afford to buy the proper quantities of chemical fertilizers and agro-chemicals and other input. In 1995, no chemical fertilizer was applied in almost all the farms, only 40 and 60% of recommended amount of chemical fertilizers were applied in 1996 and 1997.

In the production cooperative and big peasant farms, cropping schedule and cultural practices are planned by specialist (agronomist) and farm management is carried out by farm worker under supervision of agronomist and brigade leader.

4.3.5 Yield and Production

The yield of major crops in the project area from 1993 to 1996 are shown Table E-18 and summary of 1996 is shown below:

Crops	(Unit: t/ha)				
	Ilyasov	Shagan	Average	Terenozok	Kzyl-Orda
Paddy	3.83	5.02	4.51	3.39	2.88
Wheat	1.65	0.40	0.65	0.45	0.35
Lucerne	1.54	1.81	1.65	2.80	2.91
Vegetables	8.00	9.00	8.49	10.02	12.87

Source: Production cooperative "Ilyasov and "Shagan" and

Note: Vegetables includes potato and melons

The yield of wheat, lucerne and vegetables are very low compared with world average (2.4 t/ha for wheat, 6 t/ha for lucerne, 20 to 30 t/ha for vegetables). Only paddy yield exceeds average world yield (3.7 t/ha). Paddy yield in the Project Area is much higher than those of raion average and oblast average. While the yield of lucerne is lower than those of raion average and oblast average. The yield of major crops except paddy and vegetables shows a decreasing tendency in the period from 1993 to 1996 as shown below. The yield of paddy shows a decreasing tendency up to 1995, however, the paddy yield suddenly increased in 1996. In 1996, a relative large amount of fertilizers was applied to paddy compared with preceding years.

Year	(Unit: t/ha)			
	Paddy	Wheat	Vegetables	Lucerne
1993	3.63	1.14	6.33	3.33
1994	2.62	0.48	8.26	2.74
1995	2.43	0.74	6.51	1.55
1996	4.38	0.65	8.47	1.65

Source: Production Cooperative "Ilyasov" and "Shagan"

Note: Vegetables includes potato and melons

The amount of production of major crops in the project area from 1993 to 1996 are shown Table E-19 and summary of 1996 is shown below:

Crops	(Unit: ton)				
	Ilyasov	Shagan	Total	Terenozok	Kzyl-Orda
Paddy	5,740	10,030	15,770	34,610	190,170
Wheat	720	680	1,400	1,780	12,570
Lucerne	2,160	1,810	3,970	19,400	182,540
Vegetables	1,520	1,530	3,050	11,940	174,130

Source: Production cooperative "Ilyasov and "Shagan" and National Statistics Agency

Note: Vegetables includes potato and melons

The following table shows the production of major crops in recent four years, from 1993 to 1996.

Year	(Unit: ton)			
	Paddy	Wheat	Vegetables	Lucerne
1993	19,870	3,090	5,130	10,330
1994	13,560	1,200	5,620	8,780
1995	10,690	1,770	3,840	5,280
1996	15,770	1,399	3,050	3,970

Source: Production Cooperative "Ilyasov" and "Shagan"

Note: Vegetables includes potato and melons

The amount of production of major crops has largely decreased during this period mainly due to decrease of planted area. The amount of production of major crops in 1995 is only 50 to 75 % of those in 1993. The amount of production of major crops except paddy in 1996 decreased compared with 1995. There is a big difference in the decreasing rate of production among the crops. The production ratio of each crop in 1996 to 1993 is 80 % for paddy, 45% for wheat, 60 % for vegetables and 38 % for lucerne.

4.3.6 Post Harvest, Agro-Processing and Storage Facilities

As stated in Sub-section 3.3.6, main agro-processing activity in the Project Area is rice milling. There are a big rice mill JSC "Akmarzhan" and many small rice mills in and around of the Project Area. However, recovery ratio of rice from paddy is very low and quality of rice is also very low, except newly established rice mill in Shagan Area. In the Project Area, there are following agro-processing facilities.

	Capacity (per day)	Production(ton)	
		1995	1996
Ilyasov Area			
Rice mill	3 ton	90	160
Flour mill		na	na
Shagan Area			
Rice mill-1	20 ton	1,466*	3,327*
Rice mill-2**	50 ton		
Flour mill		673	686
Macaroni shop	300 kg	0	14
Milk plant	1,000 kg	120	60
Bakery	300 kg	16	16
Ice cream shop	100 kg	3	1.6
Sausage shop	100 kg	12	20
Butter shop	50 kg	0.8	0.5

Source: Production cooperative Ilyasov and Shagan

Note: * shows rice produced old rice mill, **: under construction

The performance of new rice mill in Shagan farm is at international level. The recovery of rice from clean paddy is 65 % including 6% of broken rice. Up to 1996 a larger part of paddy produced in the Project Area were processed at JSC "Akmarzhan". Agro-processing facility other than paddy is mainly used for local consumption.

As stated Sub-section 3.3.6, there is many storage facilities for agricultural commodities in and around the Project Area. In the Project Area, following storage facilities exist.

	(Unit: ton)	
	Ilyasov	Shagan
Raw rice	5,600	8,500
Cleaned paddy	700	1,100
Polished rice and seeds	350	550
Byproducts	500	1,300
Wheat	110	300

Source: Production Cooperative Ilyasov and Shagan

At present, crude fodder being kept on out doors, and fertilizers are applied just after purchasing. Therefore, there are no storage facilities for crude fodder and fertilizers. Fertilizers are temporarily (very short period) kept in the brigade office.

4.3.7 Animal Husbandry

Animal husbandry is also one of the main agricultural activities in the Project Area. The animal population by farms and farm category in the area are shown in the following table:

Area	Cattle	Sheep	Horse	Pig	Camel	Poultry
Ilyasov Area						
P. C. Ilyasov	586	0	151	0	0	0
Individual	930	2,012	332	0	0	5,500
Peasant farm Berlek	0	0	0	0	0	0
Individual	111	64	14	0	0	0
Sub-total	1,627	2,076	497	0	0	5,500
Shagan Area						
P. C. Shagan	1,314	10	183	0		
Individual	1,835	4,165	335	24	0	3,500
Ilyas	15	150	1	0	0	0
Meras	5		3	0	0	0
Abnov Zhaksyly	2	10		0	0	0
Murat	1	5	1	0	0	0
Beibit	1	10		0	0	0
Sub total	3,173	4,350	523	24	0	3,500
Total	4,800	6,426	1,020	24	0	9,000

Source: Production Cooperative "Ilyasov" and "Shagan" and Terenezek raion office

In the Project Area, cattle, sheep and goat are important animals. Forty percent of cattle are fed in the big farm, while almost all of sheep, goat and poultry are fed by individuals. From the above table, it could be said that individuals play an important role in animal husbandry. Since a large number of ruminant animals are being fed in the area, a large amount of grasses is required.

In and surrounding area, i.e., Kzyl-Orda Oblast and Terenezek raion, animal population, except poultry, has shown a decreasing tendency since last four years. This decreasing tendency seems to be temporary due to drastic change in the type of farms due to privatization of agriculture. The animal population of the farms (state and collective farms and production cooperative) has decreased during this period, however, that of individuals and peasant farmers has drastically increased as shown below.

	Farm (production cooperative, state farm and collective farm)						(Unit: '000 head)	
	Cattle		Sheep and goat		Horse		Poultry	
	Oblast	Raion	Oblast	Raion	Oblast	Raion	Oblast	Raion
1994	61.2	9.4	670.7	36.0	40.9	4.0	40.1	0.0
1995	44.0	8.4	517.9	33.8	34.8	3.3	49.6	0.0
1996	24.2	6.7	303.0	28.1	21.7	3.1	0.0	0.0
1997	11.4	5.0	208.6	35.0	15.8	2.7	9.7	1.0

	Individuals and peasant farm						(Unit: '000 head)	
	Cattle		Sheep and goat		Horse		Poultry	
	Oblast	Raion	Oblast	Raion	Oblast	Raion	Oblast	Raion
1994	121.2	11.2	308.4	26.1	22.5	1.7	143.1	13.7
1995	122.7	11.2	302.9	26.6	24.6	1.6	170.0	21.1
1996	139.5	12.8	357.9	32.1	34.4	1.9	189.4	29.0
1997	155.0	14.7	539.4	41.9	40.9	2.6	205.4	40.2

Source: State Statistical Agency

Since grasses in grazing land are not available to animals in winter, a large amount of crude fodder should be stored in summer for winter feeding. A large farm area, therefore, is required for fodder crop cultivation. At present, 25 % of farm area is being used for fodder production, but the farm area for fodder production is now decreasing.

4.4 Present Conditions of Agro-Economy

4.4.1 Marketing and Prices

The principle cash crop produced by Project farms is rice, which may be marketed through the "Tabys" Commodity Exchange. "Tabys" has been in operation for less than two years. The 1997 harvest will be the second paddy crop for which the Tabys will assist in marketing. Tabys was organized under initiative of the Oblast Administration for protection of the commodity producers and consumers. The main commodities exchanged by Tabys are rice, wheat, wool, and livestock skins.

Tabys maintains contacts with other exchanges to get market information, primarily Almaty and North Kazakstan. Prices of commodities are published every day in the newspaper, and sometimes presented over television.

Tabys maintains a register of buyers located in Kazakstan, Siberia, Aralsk, Uzbekistan, Byelorussia, Kirgystan and other former CIS countries. Communication is by fax, modem, or telephone. For the first half of 1997, Tabys made 500 transactions involving 8,000 tons of paddy and rice. About 400 of the transactions were for rice, and the balance for paddy.

If the Manager of a farm wants Tabys to find a buyer, he/she can submit a brief one page document entitled "Demand for (sale/purchase) Goods on Trading CE Tabys," which specifies commodity to be sold, quantity, where located, asking price, where to be delivered, when to be delivered and a Quality Certificate with the signature of the storehouse. Based on the Certificate and the Demand document, Tabys is assured of the quality and availability of the commodity. Then Tabys will notify prospective buyers.

If a buyer is located, Tabys provides the contract document for the buyer and seller to execute. If delivery by the seller is not on time, the contract requires the seller to pay a penalty of 20% of the value of nondelivered goods. If the buyer fails to pay on time, he pays a penalty of 15% to the seller and 5% to Tabys. Controversy over the Contract is settled by the Arbitration Commission of Tabys. On the day of contract signature, Tabys will register the transaction. Tabys charges a fee of 0.1% of the value of the transaction to both buyer and seller.

The prices are determined absolutely on a free market basis by negotiations between buyers and sellers. There is no way for Tabys to determine or influence the price.

There are also a lot of private businessmen who make their own contracts with farmers, without help from Tabys.

The Marketing Service Section of the Oblast Agriculture Department has just recently been established. This Section obtains information about the price of rice in other cities of Kazakstan and passes that information to raion offices and farmers. They have a specialist in Tereozek Raion, but, he has no experience. The marketing specialist is to work with the "Association of Goods Producers" representing the farmers. But they have not been organized or had their first meeting yet. It appears that the Oblast Department has not decided yet what marketing services it will provide. The raion marketing specialist needs guidance and training from the Oblast Department.

The farm gate prices for paddy and wheat of US\$ 200/ton and US\$ 150/ton for 1997 were calculated from international market prices projected by the World Bank as shown in Tables E-20 and E-21.

All crops and livestock products produced in the Project farms are consumed internally except for paddy. However, the following is an update on the marketing of melons and vegetables.

The JSC "Kokonis" purchased 7,000 tons of melons and watermelons from Kzyl-Orda farmers in 1996 and sold them in Russia and North Kazakstan. They expect to purchase and sell about the same amount in 1997. There are also independent dealers purchasing melons from farmers. Altogether, about 63,000 tons of melons and watermelons were purchased from

Kzyl-Orda farmers in 1996. Kokonis pays farmers T. 6-7/kg for melons in the early and late parts of the season, and T. 3 /kg during the peak harvest. In Russia the melons sell for T. 40-42/kg, and T. 15/kg in North Kazakstan. Shipments are by both truck and rail. Spoilage is 5 to 10%.

Kokonis also buys vegetables from Kzyl-Orda farmers, such as carrots, onions, and eggplant and sells them in Kzyl-Orda markets and other urban markets.

4.4.2 Agricultural Inputs Distribution

Agricultural inputs include fertilizer, pesticides, fuel, seeds, tractors and machinery, and labor. The systems for supply and 1997 prices of these inputs are discussed in this section.

(1) Fertilizer.

Marketing of fertilizer in and around the Project Area is described in Sub-section 3.4.2. The actual amount of supply of fertilizer was 60% of total nutrient requirement. The Shagan PC were only able to obtain 60 to 70% of their requirement of fertilizers because of lack of supply from "Kunarlylyk". They hope next year to get 100%. This year Ilyasov PC applied only 10% of the recommended quantity of fertilizer.

Kunarlylyk will try to supply 100% of the farmer's requirements in 1998, but, the problem is shortage of cash to pay manufacturers at the time of order. Kunarlylyk sells fertilizer to farmers as a barter exchange for paddy and buys from supply companies either in cash or barter of paddy or rice.

Fertilizer prices for 1997 from JSC "Kunarlylyk" are listed in following table. The most common source of nitrogen (N) is Ammonium Sulfate which has a price of T. 28.57/kg or US\$ 381/ton of actual N. The price of phosphorous is T. 32.6/kg of nutrient, or US\$ 435/ton. Kzyl-Orda soils are high in potassium, and consequently none has been applied for several years.

Name	Nutrient Content	Tenge/ton
Ammonium Sulfate	21% N	5-7,000
Nitro-Ammono-Phos	23% N, 23% P	15,000
Double Phosphate	46% P	15,000
Ammonium Nitrate	34% N	10-15,000
Ammonium Phosphate	10-12% N, 42-45% P	15,000

Prices include VAT of 20%.

Source: JSC "Kunarlylyk"

(2) Agricultural chemicals

Kunarlylyk also supplies the only two herbicides used in Kzyl-Orda, Fatzet and Basagran. Both are for post emergence application to paddy, and produced by the German Company BASF. According to the Oblast Agriculture Department, herbicide treatment was required on 20,333 ha out of 70,040 ha sown (30% coverage) in 1997. In Terenezek Raion, Basagran was applied to 2,550 ha and Fatzet was applied to 200 ha. The application rates are 3 liters/ha for Basagran, and 2 liters/ha for Fatzet. The price of Basagran is US\$10.66/kg, and the price of Fatzet is US\$37/kg. Kzyl-Orda farmers do not use any insecticides.

In 1997 Shagan PC purchased 2,400 liters of the herbicide (Basagran) which was applied to 800 hectares of paddy field. They bartered 208 tons of paddy at T.14.5/kg for the herbicide. Ilyasov PC applied Basagran on 200 ha.

(3) Fuel

Gasoline and diesel fuels are supplied by the new Canadian company "Hurricane Petroleum Company" which bought out "Yuzhneftigas". The exchange value of paddy for fuel are summarized in following table. Compared to 1996, the terms of trade for paddy versus fuel have further deteriorated, as was true of 1996 compared to 1995. The value of paddy is 16% less, as compared to an increase of 10% for diesel, and 18% for gasoline.

Item	1996		1997		% Change
	Tenge/ton	US\$/ton	Tenge/ton	US\$/ton	
Diesel	10,200	150	12,375	165	10
Gasoline	15,500	228	20,250	270	18
Paddy	17,000	250	15,750	210	-16

a/ Exchange rates: 1996 \$1=68 tenge, 1997 \$1=75 tenge.

Source: Oblast Agriculture Department

In 1996, one ton of paddy would purchase 1.1 tons of gasoline and 1.67 tons of diesel. In 1997, one ton of paddy exchanges for only 0.78 tons of gasoline, and 1.27 tons of diesel.

(4) Seeds

Paddy seeds are produced in State Seed Farms in Kzyl-Orda. Wheat, maize, lucerne and potato seeds are purchased from northern regions. Melon, and vegetable seeds are obtained from Shimkent and Uzbekistan. Seeds are inspected by the Oblast Seed Inspection Station. Paddy growers can use their own paddy as seed for two years, but, should replace it with new certified seed every third year in order to maintain high production. According to the Oblast Agriculture Department, farms supplied 88% of their seed requirements in 1997 from their last year's paddy and the remaining 12% of seeds were purchased. Seed prices are listed in following table.

Crop	Seeding Rate (kg/ha)	Price (T./kg)	Price (US\$/kg)
Paddy *1	300	20-30	0.33
Wheat	200	12--16	0.19
Maize grain	20	70-80	1
Maize silage	30		
Lucerne	16	100-200	2
Melon *2	3-4	600-650	8.33
Potato	3000	15-20	0.23
		20-22 *3	0.28
Onion *2	10--11	1100-1200	15.33
Carrot	8	1100-1200	15.33
Safflower	80	100	1.33

*1: Certified.

*2: Purchased from Shimkent and Uzbekistan.

*3: Price quoted by "Kokonis".

Source: Kzyl-Orda Oblast Seed Inspection Station

(5) Tractors and Machinery

Two companies supply tractors, farm machinery and spare parts in Kzyl-Orda, "Kazselhoztehnika" and "Agropromtehnika". The equipment is imported from Russia, Ukraine, and Byeloruss. Prices to farmers include 20 percent value added tax and dealer's commissions.

The Director of Agropromtehnika said farmers have not bought any tractors or machinery for four or five years. Instead of buying, farmers lease equipment for five years from the State Leasing Fund. The farmer pays an annual fee ranging from 17 to 25% of the

cost of the machine. Farmers must qualify for the equipment lease and contract with Agropromtekhnika.

Practically all the sales of spare parts to farmers are for paddy. Agropromtekhnika in turn may sell the paddy or barter with it to plants that supply parts.

Updated tractor and machinery prices from Agropromtekhnika are listed in Table E-22. Depreciation and repair costs were calculated from these purchase prices on rates of machine use and projected life of equipment under MOA "normative standards", except the estimated life of crawler tractors was increased to 10 years, and 9 years for wheel tractors based on advice from Shagan PC. Depreciation was based on the straight line method assuming 10% salvage value. Annual repair costs were based on 5% of new cost for powered equipment, and 2.5% for non-powered equipment.

(6) Labor

Oblast data on 1997 farm labor wage rates are not available because the farms no longer report this information to the Oblast Agriculture Department. Wage rates reported by the two production cooperatives in the Project Area vary significantly. Probably because of its poor condition wages are much lower on Ilyasov PC. Following are the wage rate for farm labor in Ilyasov and Shagan PC.

Wage Rates for Farm Labor in Ilyasov PC

Category	Tenge/day	US\$/day
Combine Driver, Category 8	156.5	2.09
Crawler Tractor Driver, Category 7	129.8	1.73
Wheel Tractor Driver, Category 7	116.0	1.55
Crop and Animal Husbandry, Category 7	104.9	1.40

Source: Ilyasov Production Cooperative.

Wage Rates for Farm Labor in Shagan PC

Category	Tenge/day	US\$/day
Tractor Driver	367.0	4.89
Milk Maid	190.0	2.53
Irrigator	196.0	2.61

Note: Based on 25 working days/month.

Source: Shagan Production Cooperative.

4.4.3 Crop Budgets

The main crops produced on Project farms are paddy, lucerne, wheat, vegetables and melons. Crop budgets under present conditions were prepared to determine the income from these crops. Yields used in the budgets were the average over the most recent three year period 1994-96 reported by the farms (Sub-section 4.3.5).

The financial crop budget for paddy under present conditions is shown in Table E-23. The price for paddy is US\$ 200/ton as previously stated. The gross crop value in the budget also includes rice straw which has a nutritional value of 0.10 fodder units/ton. For comparison, oat grain has a nutrient value of one fodder unit. The value of a fodder unit is US\$ 136.30 which includes the net return from feeding dairy, beef and sheep. The rationale for including livestock profits in the value of fodder is that livestock production in the Project Area would not be possible without the fodder produced from irrigated land. The cash sale price of a ton of lucerne hay is T. 30/15 kg bale, or T. 2000 /ton of hay. This works out to T. 4,000 /fodder unit (US\$ 53.33).

Costs for commercial fertilizers or chemicals are included in the crop budgets under present conditions at input levels presented in Section 4.3.4. In the case of paddy, this includes

150 kg of nitro-ammo-phos, and 50 kg of double super phosphate. Herbicides were included at the rate of 3 kg Basagran/ha, although this rate is high, because only about 1/3 of the paddy was treated with herbicides in 1997. No insecticides are presently applied to crops in Kzyl-Orda. The wage rate for labor is US\$ 0.70 per hour for machine operations and US\$ 0.37 per day for irrigation and other hand labor. Depreciation and repair of tractors and machinery are based on 1997 prices for new equipment quoted by dealers in the Project Area. Machine use is based on "normative standards" of the Ministry of Agriculture for machine life, capacity in terms of area coverage, and performance, except the life of tractors was increased to 10 years for crawlers and 9 years for wheel tractors. Depreciation is by the straight line method with 10% salvage value. Annual repair cost is 5% of purchase cost for power units such as tractors, swathers, combines, and trucks, and 2.5% for towed equipment.

Fuel consumption is based on the MOA "normative standards"; seeding rates are from the Oblast Seed Inspection Station; and labor requirements are from the MOA as reported earlier Sub-section 4.3.4.

Twenty percent VAT is included in the price of everything purchased by the farm, and it is also charged on every sale. Farms are charged 20% VAT on sales, but, credited for VAT previously paid on production inputs.^{8/} The VAT tax on paddy in Table E-23 (US\$ 53.68) reflects this adjustment to the tax paid. A social cost tax for pensions amounting to 32% of the total wage bill is also included in the budget. The net return per ha is US\$ 204.29 and the labor requirement per ha is 5.6 days.

The results of financial crop budgets for other crops under present conditions are summarized below (Table E-23 - E-28).

Crop	Gross Value *1	Production Cost	Labor Days	Net Return
Rice	\$738	\$534	5.6	\$204
Lucerne	136	181	4.1	-45
Wheat	151	298	3.3	-147
Vegetables	914	773	59.3	141
Melons	453	440	26.4	13

*1 Includes byproducts.

Paddy, vegetables and melons are the only profitable crops. Net losses from lucerne and wheat are caused by very low yields. These negative returns indicate that present yields over a period of several years will not be sufficient to sustain investment costs of farm equipment or wages at the level budgeted.

4.4.4 Farm Economy

The budget for a 6,800 ha farm under present conditions is shown in Table E-29. The average cropping pattern in the Project Area of 13,690 ha over the period 1994-96 representing present conditions is 28.4% paddy, 19.2% lucerne, 13.7% wheat, 3% vegetables, and 2% other crops. An average of 33.7% of the cropland has been idle over the past three years.

In addition to the VAT and social cost tax which were included in the crop budgets, a land tax is assessed in the farm budget at the rate of T. 100 (US\$1.33) per ha. Income tax is charged at the rate of 10% of profits which are determined based on sales minus production costs.^{2/}

The net return from the 6,800 ha farm is US\$116,870, or US\$17.19/ha. All of the crops except rice and vegetables are losing money for the farm because of low yields as stated in Sub-section 4.4.3.

^{8/} Information on VAT, land tax and income tax is from the Agronomist, Project Implementation Unit, MOA, Almaty.

^{2/} Ibid.

The crop budgets include labor costs of US\$0.70 per hour for machine operation, and US\$0.37 per hour for irrigation and hand labor plus the social cost for pensions. The total cost of wages is US\$125,880 and the cost of pensions is US\$59,200 for the 6,800 ha farm. The number of workers reported from the farm survey averages one worker per 4 ha. Including US\$125,880 from wages and US\$116,860 of net farm income, the average return per worker under present conditions is US\$143.

The preceding results are indicative of the productivity of Shagan PC and Ilyasov PC under present conditions. Shagan PC is better off than the situation depicted here, and Ilyasov PC is worse off. The farm budget does not reflect that workers are directly consuming much of the production of the farm and the farms also exchange paddy for most of their off-farm consumption goods or production inputs, thus reducing cash transactions, and resulting in less value added tax and income tax than shown in the budget. Also the crop budgets include an annual charge for depreciation of tractors and machinery purchased at current prices, which the farms are not actually paying at the present time. Nonetheless, the results of this analysis indicate that farms in the Project Area are not producing enough income under present conditions to sustain the workers and their families living on them.

There are six other farms in the Project Area. The largest of these, Berlek, consists of 56 families farming in the same manner as the larger farms on 1,161 ha, of which 494 ha are cultivated. 1997 was the first crop year for this farm. The preceding estimates of income per ha and per worker over the period 1994-96 are also representative of the present condition of this farm.

There are five small peasant farms in the Project Area. Four of them are single family farms, and one of them is comprised of three families. According to the Farm Survey conducted in autumn of 1996, one of these farms, consisting of 2 ha of cultivated land out of 20 ha total land ownership has ceased operation as a farm.

The present condition of the remaining 4 small farms could be analyzed individually since there are so few of them, but, this would violate their owners' rights of privacy and confidentiality. Therefore, they have been aggregated into a group as shown below.

Crop	Area (ha)	Production (ton)	Yield (kg/ha)	Price (T./kg)	Gross Value (T. 000)	Net Value (T. 000)
Paddy	30.0	51.0	1,700	15.0	765	230
Apples	5.0	10.0	2,000	10.4	104	45
Potato	0.7	7.5	10,714	10.0	75	42
Maize Silage	0.5	1.5	3,000	1.8	3	0
Subtotal	36.2				947	316
Crops						
Non-cultivated	122.8					
Total Land	195.2					
Livestock sold					157	79
Milk (liters)		7,560	28/day	20	151	76
Subtotal Livestock					308	154
Total Value					1,255	470
Water Charges (\$17/ha)						-46
Land Tax (100 tenge/ha)						-16
Net Return Before Income Tax						408
Income Tax (10%)						-41
Net Income After Taxes						367

Source: Farm Survey

Assuming all the crop labor except picking apples is done by the farm families, there is an additional wage income included in production costs of T. 94,000. Therefore, the total net income after taxes is estimated at T. 460,000. There are 29 men and women over the age of 16

living on these four farms. Assuming they all are workers, the average income/worker is T. 15,860, or US\$233 at the 1996 exchange rate.

This analysis indicates that, on average, the surviving small private farms are doing better than the larger ones under present conditions, despite a relatively small proportion of irrigated land relative to their total holdings. Of course, the high value per ha of the potato and apple crops is influencing the results. Also, much of the crop and milk production are used for home consumption, so taxes and cash income are probably less than estimated.

The financial condition of the two Production Cooperatives in the Project Area is quite different. Shagan PC is in good financial condition and able to borrow money this year to finance purchase of a rice mill, one elevator, 2 tractors, 3 reapers, and a combine. Ilyasov PC currently has a debt of T. 35 million. Last year their debt was T. 79 million. The PC can not get any credit because of the debt, and uses all of its production to repay debt, so there is no profit and nothing to sell for cash.

Shagan PC is currently T. 4 million in debt that is due November 1, 1997. Shagan PC obtained a loan of US\$286,000 under the ADB medium term credit program, of which US\$240,000 was spent for purchase of a German manufactured rice mill with 20 ton/day capacity. The remaining approximately US\$40,000 was spent for arranging the purchase of the rice mill. Terms of the loan are to be repaid in 4 years at 11% interest. The interest rate is composed of 7% to ADB, 2% to Agroprombank, and 2% to the Organization of Agro Leasing.

The Shagan PC manager is currently negotiating to buy a combine that costs US\$140,000. The down payment is 35% of the cost and the remaining 65% is due in five months. He has applied for a loan from Kzyl Orda Agroprombank to cover the first 35% down payment under 6 month term at 32% annual rate of interest.

Shagan PC owes the State Agriculture Support Fund amounting to T. 1,072,000 due on December 15, 1997 and has a long term debt of T. 88,000 tenge due in year 2004. Ilyasov PC owes the fund 1,910,000 tenge due on December 15, 1997 and has a long term debt of T. 258,000 in 2004. Balance sheets of assets and liabilities of the two Production Cooperatives are presented in Tables E-30 and E-31.

4.5 Present Conditions of Agricultural Supporting Services

4.5.1 Agricultural Research

Agricultural research and extension are defined as the production and dissemination of new scientific agricultural information and new technologies through systematic means to reach farmers directly and thereby improve their production techniques and technologies in order to increase yields, reduce inputs, control pests and weeds, improve soils, maintain the ecology, maximize irrigation efficiency, improve labor productivity, rationalize marketing, and increase household income and welfare. This traditional understanding as used in most nations does not apply directly to the case of Kazakhstan. Although the scientific sector of agriculture was well developed under the Soviet Period, the research generated was unevenly distributed and consumed. Primarily, scientific agricultural research was directed to increasing yields of state farms by disseminating research findings and recommended practices directly to oblast officials, farm managers, and specialists.

The responsibility for agricultural research is with the Kazakstan Academy of Sciences which operates an agricultural division. This academy has been reduced in size and budget and a number of research farms have been privatized. Before 1994, there were two research institutes in the Kzyl-Orda Oblast - the Kzyl-Orda Agriculture Research Institute and the Soil Research Institute. Presently, there is only one institute, the Pre-Aral Scientific Research Institute for Agro-Ecology and Agriculture (Pre-Aral Institute).

This institute has nine research departments and employs 85 personnel of which 33 are scientists as shown below. The number of institute employees has been declining during the period of national independence. In the 1980's there were 166 employees. The institute has an annual budget of T. 11 million.

Department	Scientists	Staff	Total
Director's Office	0	2	2
Reclamation & Soil Fertility	4	4	8
Land Tenure	4	7	11
Vegetables & Melons	4	1	5
Fodder Crops	3	6	9
Paddy & Seed Production	5	6	11
Agro-Economics	3	0	3
Animal Husbandry	5	0	5
Astrakhan Sheep	4	2	6
Ecology & Information	1	3	4
Administration	0	10	10
Supporting Services	0	13	13
Total	33	54	87

Source: Pre-Aral Institute

The Pre-Aral Institute undertakes research on new crop varieties, seed improvement, vegetable production, animal husbandry, soil conservation and fertility, agro-economics, land tenure, and agricultural machinery. It also is a provider of breeder seeds for paddy seed production. It produced 2,000 tons of paddy seed in 1996 on its research farms.

The institute currently collaborates with the only two state research farms in the oblast: the Karaultubinsky Research Farm located near Kzyl-Orda town and the Tagushensky Research Farm located 200 km from Kzyl-Orda town in the Zhanakorgan Raion. These two farms produce breeder paddy seed for the oblast, produce crops for the market, and each operates an experimental plot of 100 ha. Research is conducted on rice, wheat, lucerne, and animal husbandry. Previously, staff scientists also carried out test plots on state farms, but this is no longer the case. The following table identifies area and production.

Item	(Unit: ha)	
	Tagushensky	Karaultubinsky
Total Area (ha)	14,237	4,911
Total agricultural land	12,140	4,568
Cultivated area	5,910	1,281
Paddy	2,110	450
Lucerne	1,200	200
Wheat	700	200
Other crops	1,900	431
Hay	190	760
Pasture	6,040	2,016
Other agricultural land	0	511

Source: Pre-Aral Institute

4.5.2 Agricultural Extension and Farmer Training

Extension services to farmers, as carried out in western nations, do not exist in Kazakhstan, but several donor agencies are planning for their development in the future. These findings were issued in the form of reports and pamphlets. In the project area, the Pre-Aral Institute is not publishing any research documents for farm use. The last pamphlet was issued in 1993. Managers and other officials of farms may presently request copies of previous pamphlets and reports at no cost. To raise revenue, the Pre-Aral Institute is planning to charge for all research reports in the near future.

Occasionally, research findings are published in scientific journals such as the *Agricultural Bulletin of Kazakhstan*. These scientific journals are not regularly read by farm managers or technicians.

The institute, budget permitting, could offer 1 - 2 seminars per year to agricultural officials such as raion and oblast department of agriculture officials, farm managers, farm specialists, and brigade leaders. In the past, these were reportedly conducted on experimental plots administered by the institute. Peasant farms and private family farmers have never been invited to participate in these seminars as the institute director does not think that such farms are within his mandate.

Thus, agricultural extension and farmer training are not occurring in the Kzyl-Orda Oblast or Project Area. There are no written reports issued directly to farmers and there are no materials being disseminated via radio or television broadcast. No on-site training is being provided to farmers by the Pre-Aral Institute or the Ministry of Agriculture. The raion and oblast departments of agriculture are also not providing seminars or written training materials to farmers. Peasant farms are not being provided with any technical assistance or training.

The Ministry of Agriculture is administratively responsible for agricultural training. It has the mandate to arrange demonstrations or seminars for specialists from collective farms. The link between research and training is absent because the Kazakstan Academy of Sciences, which is responsible for agricultural research, is completely independent of the Ministry of Agriculture. In addition, such training as was provided was for large collective farms and cooperatives. The ministry provides no training for private family farms or peasant farmers. Thus, this project proposes a agricultural extension component.

In the Project Area, the Kzyl-Orda Oblast Department of Agriculture is responsible for the development of agriculture and animal husbandry. The department is organized into six divisions and employs 40 staff. The organization of the department is shown in Figure E-7. The six departments include:

- (i) Department of Production - collection of data on crop production and animal husbandry and recommendations on improved practices.
- (ii) Department of Veterinary - diagnostic, medical, and preventive veterinary measures; animal epidemiology; and contagion control.
- (iii) Department of Technical Policy, Service, and Safety - Registration of machinery, machinery inspection, machinery operator certification, and fire and traffic safety.
- (iv) Department of Economic Reform - data collection and analysis on agricultural reform, monitoring of debt, food consumption, production forecasting, and provision of assistance to small and medium agricultural businesses.
- (v) Department of Marketing - marketing assistance to commodity producers and trade associations.
- (vi) Department of Finance and Investments - accounting, financing, control and liquidation of debts for electrical power, spare parts, fuel, and inputs.

4.5.3 Agricultural Credit

Agroprombank is the only source of agriculture cash loans for Kzyl Orda farmers except for special State Fund loans to small farmers which are described later. Agroprombank is a private bank, with funds generated by deposits and returns on loans. The Bank has 6,225 staff and 236 branch offices. As of January 1, 1996, Agroprombank had T. 6.9 billion in assets and credit investments totaling T. 2.3 billion. The Kzyl Orda Branch has outstanding loans of T. 200 million as of the 1st of August broken down as 40% agriculture, 20% industry, 30% small business and 10% other. All of their loans are short term, one year or less. This year the interest rate on loans is 30%, compared to 45-50% last year.

Of the T. 80 million loaned to agriculture, T. 26 million was for sowing, T. 21 million to Shagan PC for a rice mill, T. 21 million to Bessaryk PCA in Zhanakorgan Raion for a rice mill, T. 2.33 million for a rice mill to Daolet, a small private farm in Terenozek Raion, 2.25 million to Besaspapzhushaly settlement in Karmakshy Raion for a flour mill, and T. 1.12 million to Besaryk Farm Association in Syr Darya Raion for a flour mill. All of these loans, except the T. 26 million for sowing were financed by the ADB mid-term credit line through Agroprombank. The bank will loan an additional T. 20-25 million to Kzyl Orda farmers for harvest expenses.

Agroprombank requires 150% collateral on the value of their loan. If a farmer fails to pay when the loan is due, the Bank will take possession of his paddy and other collateral and sell it to satisfy the loan. Loans must be repaid in cash, not barter.

According to the Deputy Manager, there is no shortage in the supply of funds for making loans. They receive funds through the ADB mid-term credit line, which were loaned for purchase of three rice mills and two flour mills mentioned above. Kazkommercbank also used the ADB credit line to finance a loan of T. 15 million to Aidan Limited Partnership in Kzyl Orda city for purchase of a flour mill. Exim Bank loaned T. 4.425 million for a bakery to the private enterprise "Togzhan" in Zhanakorgan Raion, also financed by the ADB mid-term credit line.

There are no other bank sources of cash credit available to Kzyl-Orda farmers. Barter credits in exchange for paddy are made by Hurricane Petroleum Company for fuel, JSC "Agropromtekhnik" for tractor and machinery spare parts, and JSC "Kunarlylyk" for fertilizers and pesticides.

In December, 1994, the Kazakstan Government created the State Fund for Financial Support of Agriculture to improve the economic condition of private farms. The fund is administered by the Ministry of Agriculture. Of T. 85 million Kzyl Orda farm debt due to this fund on December 15, 1996, 60% was paid. The T. 34 million in arrears was carried over to this year and the total amount due for payment on December 15, 1997 is T. 105 million. The total remaining debt of Kzyl Orda farms to the State Fund is about T. 150 million, a relatively small amount compared to the total debt of T. 6 billion owed by all Kazakstan farms.

In 1996, the State Fund paid out T. 32 million to Kzyl-Orda farmers. Of this amount, T. 22 million was paid as fertilizer subsidies, and T. 6 million as herbicide subsidies. In 1997 the fund paid T. 10 million to Kzyl Orda farmers by subsidizing 40% of the cost of herbicides. No fertilizer subsidies were paid in 1997.

In 1997, the State Fund loaned T. 5.9 million to 34 small peasant farms. The loans are mostly for T. 100,000 - 150,000 (US\$ 1,333 - 2000) per farm, although one farm received T. 1 million (US\$ 13,333). In 1996, the same amount was loaned to 35 farms. The loans are repayable in 3 to 5 years at 10% interest. The loans are for sowing, fertilizer, spare parts, etc. There is no loan program for large farmers.

In 1996, T. 600 million (about US\$ 8.6 million) was allocated from the State Budget for the State Leasing Fund for the purpose of purchasing tractors and farm machinery and leasing them to farmers.^{10/} Approximately T. 30 million from the fund was available to Kzyl-Orda (about US\$0.5 million).

Execution of the Fund requires three contracts; 1) factory, 2) with farms, 3) with the leasing fund. Each Oblast has a leasing company which contracts with the leasing fund, machinery factory, and farms. The leasing company must have a bank guaranty and approval of the Oblast Akim. Agropromtekhnik is the leasing company for Kzyl-Orda.

^{10/} Central Department of Technical Policy and Service, MOA.

Terms to the farmers under the leasing fund are five years for repayment on machinery costing more than T. 700,000 (US\$10,000), and three years for machinery costing less. In the first year of a five year loan the farm pays 20% of the principal, up to 8% of the machine cost to the leasing company, 4% of the machine cost to the leasing fund, and 2.5% of the machine cost for insurance. In subsequent years the farm pays 20% of the original principle, plus 2.5% on the remaining debt. So, for example on a machine costing US\$10,000, the annual payment schedule is summarized in following table:

Year	Principal	Machine cost*1	Machine cost*2	Insurance	Remaining Debt	Total
1st	2,000	800	400	250		3,450
2nd	2,000				200	2,200
3rd	2,000				150	2,150
4th	2,000				100	2,100
5th	2,000				50	2,050
Total	10,000	800	400	250	500	11,950

Source: Agroprombank

*1: to leasing company

*2: to leasing fund

The total cost to the farm over the five year period for this US\$10,000 machine is US\$11,950, including US\$1950 for interest, fees, and insurance. The internal rate of return of this schedule of payments for the machine is 6.9%.

4.6 Agricultural Development Plan

4.6.1 Farm household and Agricultural Labor Force

Based on the farm survey, the average farm size and the family size as well as the labor force per household in the Project Area are estimated as follows:

Item	Ilyasov*3	Shagan*4
Average Farm Size*1 (ha/ household)	11.5	8.0
Average Farm Size*2 (ha/ household)	14.3	10.4
Average Family Size (persons/household)	5.1	5.8
Average Labor Force (persons/household)	3.0	3.2

Note *1: Present condition, *2: Include reserve land

*3: P. C. Ilyasov and P. F. Berlek, *4 : P. C. Shagan and peasant farms

According to the data collected from Oblast Statistics Office, the population the Project Area remained steady from 1994 to 1996 due to both higher death rate and emigration. The labor requirement is expected to decrease under future "without project" condition, because of reduction of irrigated area as mentioned in Sub-section 3.6.3. As a result, number of emigrant from the Project Area will increase. Under future "with project" condition, however, the labor requirement would increase after implementation of the Project, because of increase of the planted area, though slightly. As a result, the emigration would be restrained to some extent, and the present labor force mentioned in the above will not be much changed in future.

The present labor requirement in the farming practice is very low, since completely mechanized cultivation is being employed in the Project Area as mentioned in Sub-section 3.3.4. In future, the labor requirement under the "with project" condition will also be low. Therefore, the above average labor force per household would be enough to cover the labor requirement under the both present condition and "with project" condition.

4.6.2 Future Land Use

At present there is 13,690 ha of original rice rotation area, which includes 5,200 ha of presently abandoned area in 1996. Under "with project" condition, however, all the abandoned area will be recovered to normal cultivation area, and all the original rice rotation area will be

used for crop production. On the contrary, under "without project" condition, the actually irrigated area will continue to decrease due to increase of abandoned area, as shown below.

(Unit: ha)					
Area	1992	1993	1994	1995	1996
Ilyasov	6,110	5,240	4,890	4,960	3,530
Shadan	6,440	6,230	6,000	5,850	4,960
Total	12,550	11,470	10,890	10,810	8,490

Source: Committee on Water Resource, Ilyasov and Shagan
Production Cooperative

The future decrease of the irrigated area is forecasted based on the above table and shown in Figure E-8. According to this forecast, the presently irrigated area will decrease from 8,490 in 1996 to 2,310 ha which is the average of the area to be decreased during the project life of 50 years and deemed to be the irrigation area under the "without project" condition. Based on the above study result, the future land use for both "with project" and "without project" conditions is estimated as follows:

Farm	Without Project			With Project		
	Abandoned	Irrigated	Total	Abandoned	Irrigated	Total
Ilyasov*	5,700	780	6,480	0	6,480	6,480
Shagan**	5,680	1,530	7,210	0	7,210	7,210
Total	11,380	2,310	13,690	0	13,690	13,690

Note: *, P. C. Ilyasov and P. F. Berlek, **, P. C. Shagan and peasant Farms

4.6.3 Proposed Cropping Pattern

For the establishment of profitable and sustainable cropping system, paddy, wheat, safflower (or sunflower), vegetables, melons and lucerne are selected as the proposed crop after consideration of the soil and climatic conditions, growth period, profitability, demand of food stuff, crop rotation, soil conservation, soil fertility and environmental balance. Particularly for the soil and climatic conditions, selection of crop is made in consideration of tolerance to salinity and to high temperature in summer. Then, the recommendable cropping system is established as shown in Figure E-9, taking into account the crop rotation, requirement of livestock feed, conservation of soil fertility and prevention of accumulation of salt on soil surface. Lucerne is also important considering the soil conservation and animal food and will be cultivated about 30% of total cropped area. Wheat is also important for food and its cultivated area is about 10% of total cropped area. Other crops such as vegetables, melons and safflower are also necessary, and their area is 10% of total cropped area.

The area of each crop under "with project" condition and "without project condition" is shown below:

Crop	(Unit: ha)					
	Ilyasov*1		Shagan*2		Total	
	without	with	without	with	without	with
Paddy	390	3,240	770	3,610	1,160	6,850
Wheat	100	850	220	940	320	1,790
Safflower	10	130	30	140	40	270
Vegetables*3	80	320	120	360	200	680
Lucem	200	1,940	390	2,160	590	4,100
Total	780	6,480	1,530	7,210	2,310	13,690

Note: *1; P. C. Ilyasov and P. F. Berlek, *2; P. C. Shagan and peasant Farms

*3; Includes melons