CHAPTER 7 INTEGRATED REGIONAL DEVELOPMENT PLAN FOR MANGISTAU OBLAST

7.1 Structure of Mangistau Integrated Regional Development Plan

The integrated regional development plan of Mangistau Oblast is formulated under the development objectives and basic strategy established in Section 5.1. Specific projects and programs are formulated under the strategy by sector in line with the basic strategy. Implementation of the proposed projects and programs would collectively realize the levels of development specified by the socio-economic framework and the spatial structure dictated by the spatial framework presented in Section 6.2, and the development scenario described in Section 6.3.

The proposed projects and programs are structured into four initiatives. The Regional Spatial Structure Strengthening Initiative consists of such infrastructure projects that will collectively enhance the competitiveness of various economic activities by reducing economic transaction costs. The emphasis is placed on establishing a multi-modal transport system comprising roads, railways and terminal facilities, and on strengthening urban functions and selected rural service centers in line with the basic strategy. This will particularly facilitate the development of logistic industry.

The Industrial Cluster Development Initiative consists of support programs for the five industrial clusters in line with the basic strategy. The development of these clusters will generate more lucrative employment opportunities pursued by the first (economic) objective of the Mangistau regional development through the diversification of regional economy. It will also contribute to the second (social) objective to reduce disparities between urban and rural areas and between different segments of the society.

The Living Environment Improvement Initiative consists of projects and programs to generate additional livelihood opportunities, to improve the social services delivery, and to improve some physical infrastructure and environment. It responds directly to the third (environmental) objective of the Mangistau regional development, but will contribute to the second (social) objective as well.

The Mangistau Environmental Initiative addresses to the imminent and long-lasting environmental problems that the Oblast faces. It aims not simply to overcome these problems but through the process to establish Mangistau Oblast as the center of advanced environmental management in the Caspian Sea region. This initiative would be supported by the industries and residents of enhanced awareness, and thus contribute to the social as well as economic and environmental objectives.

The broad correspondence between the four initiatives and the three objectives of the Mangistau regional development is shown in Table 7.1.

Table 7.1 Broad Correspondence between Development Initiatives and Regional Development Objectives

Development Initiative	1.Economic objective: Generation of lucrative employment opportunities	2.Social objective: Reduction of disparities	3.Envirnmental objective: Improvement of living environment
Regional Spatial Structure Strengthening	√√	√	
Industrial Cluster Development	√√	√√	
Living Environment Improvement		√	√√
Mangistau environmental Initiative	√	√	√

Source: JICA Study Team

7.2 Regional Spatial Structure Strengthening Initiative

7.2.1 Artery roads improvement projects

(1) Development concepts

The development of artery road network for Mangistau should aim at the contribution to strengthening the international transport artery for Kazakhstan as a whole including the east-west and the north-south corridors, as well as the improvement of links between major settlements in the Oblast. It consists of the establishment of republican road network, improvement of intra-regional links, and improvement of local roads serving larger settlements as described below (Figure 7.1).

Figure 7.1 Locations of Project Roads

Establishment of republican road network

Republican roads constitute important part of the trunk road system in Mangisatu to provide links with other regions. At present, only 59% of the republican road length is paved as shown in Table

7.2. The highest priority may be accorded to the road section from Aktau to Atyrau by Beineu as this constitutes part of both the TRACECA and the north-south corridors.

Table 7.2 Pavement Ratio of Republican Roads in Mangistau Oblast

Road	Length by road pavement (km)				Total length (km)	% of paved road
	Paved		Unpaved			
	Asphalt	Black gravel	Gravel	Soil		
Republican	606	-	393	34	1,033	59

Source: Mangistau Branch of CTID, motor roads section of Mangistau Oblast, Aktau city Akimat

Improvement of intra-regional links

There exist several weak links between districts in Mangistau. The improvement of these sections will strengthen the republican road network. The Aktau-Shetpe road is not much used due to unpaved sections, while it provides the shortest link over the republican road. It also constitutes part of the TRACECA and the north-south corridors linked to Atyrau. Frequent bus services are provided on this road section.

The Zhanaozen-Seyutes-Beineu road linking two districts has unpaved sections. It provides links to Turkmenistan and Uzbekistan as well. This road is important also as a service road for cargoes carried by the railway. These intra-regional links are particularly important for the regional development of Mangistau as a whole.

Improvement of local roads serving large settlements

Some local roads serve as access roads for livelihood activities in larger settlements. The local roads to be paved to support the livelihood development of respective settlements are shown in Figure 7.2.

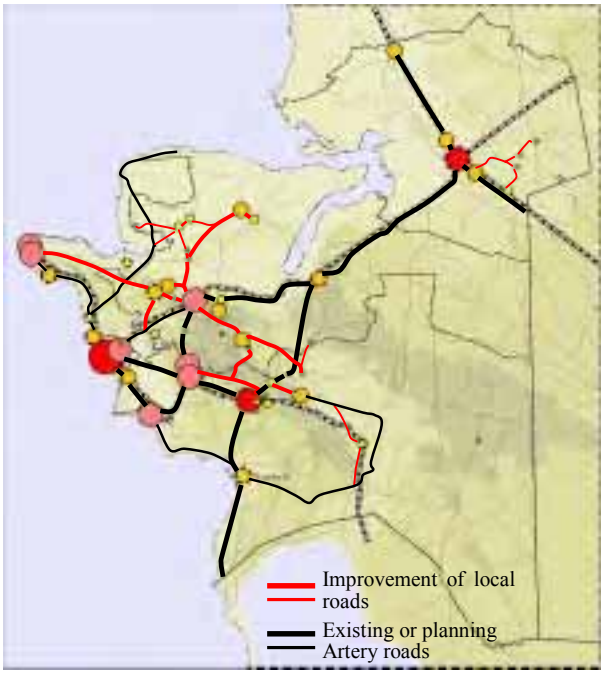


Figure 7.2 Major Settlements and Local Roads to Be Improved

(2) Design criteria

For the roads to be improved as part of the artery road network of Mangistau, design criteria are

established based on the criteria of Kazakhstan. The roads in Kazakhstan are classified into Category I through Category V according to traffic volume and road administration, and typical cross section is defined for each. The project roads fall in Category II through Category V as shown in Table 7.3. Structure standards for roads by category are summarized in Table 7.4.

Table 7.3 Classification of Project Roads

No.	Section	Administrator	Future traffic demand (pcu/day)	Category
1	Aktau-Beineu	Republican	10,200	II
2	Beineu-Atyrau border	Republican	4,000	III
3	Beineu-Uzbekistan border	Republican	3,400	III
4	Zhanaozen-Turkmenistan border	Republican	900	III
5	Zhanaozen-Seyutes	Republican	3,000	III
6	Aktau-Shetpe	Local	3,900	III
7	Kuryk-Kenderli	Local	500	IV
8	Zhanaozen-Kenderli circuit	Local	Little	IV
9	Local roads	Local	Little	IV-V

Table 7.4 Road Structure Standards

		Road Category					
		I-a	I-b	II	III	IV	V
Number of Lanes		4 6 8	4 6 8	2	2	2	1
Width	Lane (1 lane)	3.75	3.75	3.75	3.5	3.0	4.5
	Surfacing	16.5 24.0 31.5	16.5 24.0 31.5	9.0	8.0	7.0	4.5
	Carriage way	15.0 22.5 32.0	15.0 22.5 32.0	7.5	7.0	6.0	4.5
	Reinforce	0.75	0.75	0.75	0.5	0.5	-
	Shoulder	3.75	3.75	3.75	3.25	2.0	1.75
	Median	6.0	5.0	-	-	-	-
	Median side shoulder	1.0	1.0	-	-	-	-
	Right of way	28.5 36.0 43.5	27.5 35.0 42.5	15.0	13.5	10.0	8.0

Source: Road design standards in Kazakhstan

(3) Projects

1) Aktau-Beineu road upgrading

The Aktau-Shetpe section of 298km is subject to improvement by the project. This section corresponds to a part of the on-going Atyrau-Aktau road rehabilitation project of 900km supported by a loan from the European Bank for Reconstruction and Development (EBRD). This involves 300km section for pavement improvement, and 300km unpaved section undertaken by the Committee for Transport Infrastructure Department (CTID) of the Ministry of Transport and Communication (MTC). The total project cost is US$243 million, of which US$119 million is provided by the EBRD loan. The Aktau-Beineu road upgrading is estimated to cost US$81 million.

2) Beineu-Opornoy road upgrading

This project will improve the link between Beineu and Opornoy on the border with Atyrau. It also constitutes part of the Atyrau-Aktau road rehabilitation project as well as the Beineu-Shetpe road improvement project. The project cost is estimated to be US$64 million. It is administered by CTID, and the construction is undertaken by Turkish enterprises for completion in 2008.

3) Beineu-Uzbekistan border road improvement

The project will improve the existing road from Beineu to the border with Uzbekistan of 84km. This road section is considered of high priority in the western Kazakhstan according to the State Program of Road Sector Development approved in 2001. The project is administered by CTID. The project cost is estimated to be US$25 million, of which US$5.3 million is borne by the Government.

4) Zhanaozen-Turkmenistan border road improvement

The project will improve the republican road of 180km from Zhanaozen to the border with Turkmenistan. This road constitutes part of the north-south corridor connecting Aktau to Turkmenistan by Bekdash. It is specified as a high priority project in the western Kazakhstan in the 2001 State Program. The project is administered by CTID. The project cost is estimated to be US$53 million, of which US$13.3 million may be borne by the Government.

5) Zhanaozen-Sayutes road improvement

The project is to improve the existing local road of 95km from Zhanaozen to Sayutes. It involves the pavement and expansion works. The road is considered important for logistics and distribution functions for Mangistau, and thus the Oblast government is expected to take the initiative for the project implementation. The estimated traffic on the road is about 3,000pcu/day, and the road is classified as Category III. The project cost is estimated to be US$28 million.

6) Aktau-Shetpe road improvement

The project is to improve the existing local road of 40km from Akatu to Shetpe. At present, many traffic make detour to the republican road by Zetybai as the local road is of poor surface conditions. The initiative by the Oblast government is expected for its implementation. The estimated traffic volume is 3,900pcu/day, and the road is classifies as Category III. The project cost is estimated at US$12 million.

7) Kuryk-Kenderli road rehabilitation

The project will develop the road from Kuryk to Kenderli along the coast of 95km as a local road. It constitutes part of the Aktau to Turkmenistan border road, which provides the alternative to the current route through Zhanaozen. The traffic demand is estimated to be about 500pcu/day in 2015, and the road classification is Category III. The project cost is estimated at US$22 million.

The Zhanaozen-Kenderli circuit road and the local roads improvement are described under different initiatives and programs.

7.2.2 Railway network development projects

(1) Development concepts

The results of integrated logistics system for railway container transportation carried out by JICA in 2006 show that it is necessary to develop the new rail line between Beineu and Zhezqazghan for

the improvement of TRACECA corridor, the Dostyk railway terminal as the gateway of Kazakhstan, the logistic center in Aktau, and the expansion of Aktau international sea port in order to ensure the geographically advantageous position of Kazakhstan on the east-west transport corridors. Therefore, the priority rail projects in Mangistau should be considered by adjusting these proposals for the developments of railway sections as part of international corridors for logistic distribution and new lines linking to the seaports for oil export.

These new rail links may be justified as they are connected directly or indirectly to ports for oil shipment, where oil-related freight demand is expected to develop. The railway network development in Mangistau should take advantage of the development of oil-related freight in order to provide the comprehensive area coverage, eliminating the areas currently deprived of rail services (Figure 7.3). This will result also in the establishment of multi-modal transport system for Mangistau and Kazakhstan, which is an essential condition for the international logistic function.

Most larger settlements in Mangistau are located along the railway lines. The areas without rail services are the northern part of Tupkaragan including Fort Schevchenke, Bautino and Tauchik, the northern part of the Mangistau rayon and Kuryk. Of these areas, Kuryk will be served by the railway extension from the Yeralievo station under construction prior to the port development there. Moreover, in relation with the development of the Bautino port and the Sartyas port, a railway from Aktau to Fort Schevchenko and Bautino is expected to start, and a railway from Shetpe to Bautino by Tauchik is also planned.

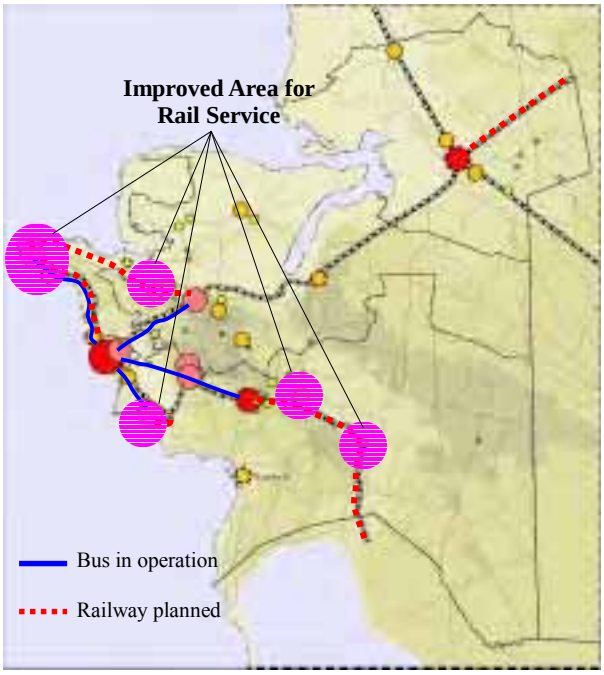


Figure 7.3 Missing Railway Links for Major Settlements

(2) Design standard

The railway systems in Bulgaria, Rumania and Turkey follow the European standard with the rail gauge of 1,435mm, while in Kazakhstan the rail gauge is 1,520mm as in all other TRACECA member countries (Figure 7.4). The present standard should be maintained for the new rail links in Mangistau as well.

Source: United Nations Economic and Social Commission for Asia and the Pacific

Figure 7.4 Railway Gauge System around CIS Countries

(3) Projects

1) Beineu-Shalkar line

The project is to establish a new rail link to reduce the length of the present TRACECA route of the east-west corridor (Figure 7.5). The total length is 1,079km from Beineu to Zhenzkangen by Shalkar, of which the length of about 120km passes through Mangistau. It is listed by KTZ as a high priority section. The Government announced the project outline in 2007, and a feasibility study has been carried out. It is reported that the travel time by railway from China to Europe will be reduced to 12 days after the completion of the project as compared to about 40 days by sea. The project cost from Beineu to Zhenzkangen is estimated to be US$1.5 billion, of which about US$700 million is for the Beineu to Shalker section. KTZ is making arrangements for implementation by concession.

Source: Reassessment of the Regional Transport Sector Strategy, ADB

Figure 7.5 New Rail Link for TRACECA Corridor

2) Zhanaozen-Turkmenistan border new line

The project will establish a north-south rail corridor linking the Persian Gulf to Russia and EU. Several alternatives were examined by the feasibility study, starting with the route from Yelarievo in Mangistau to Turkmenbashi in Turkmenistan. Finally selected is the route linking Uzen, Gyzylgaya, Bereket, Etrek and Gorgen for a total length of 697.5km, of which 140km is within the Kazakh territory (Figure 7.6). The freight demand is projected at 5 million ton per year initially to increase to 12 million ton in 2012. Passenger services are also conceived. The project cost from Kazakhstan to Iran is estimated to be US$1.5 billion, of which about US$300 million is within the Kazakhstan territory.

Figure 7.6 Locations of Railway Projects

3) New rail link to Aktau port via SEZ

A new rail link to the Aktau port is considered within the port expansion project, as the present rail capacity for freight is already tight (Figure 7.7). Although KTS serves the Aktau port at present, reportedly the freight capacity is about 9 million ton per year. Even the present amount of oil handling at the Aktau port is more than 9 million ton, and increase of oil export up to 15-20 million ton is predicted after the completion of Aktau port expansion. The rail link is part of the planned extension of KTZ rail for nation-wide coverage in Kazakhstan in lieu of KTS, and a feasibility study has also be done as part of the port expansion. The rail link of KTZ will improve the situation of current monopolistic conveyance by KTS as well as increase the freight capacity to the Aktau port, and improvement of service by reduction of transportation fee is also expected. According to the feasibility study, an average transportation cost for freight will be reduced.

The logistics center proposed by another JICA study is planned in the SEZ next to the Aktau port, where the railway for freight is drawn and linked also to the Aktau port. It is desirable to develop the new rail of KTZ linking to the Aktau port via the logistics center in the SEZ. The length of new rail connecting to the Aktau port is approximately 15km. This rail project is supposed to be developed by KTZ or KazMunaiGaz, but cost sharing is a matter to be settled for the rail section passing through the SEZ. The total cost of project is estimated to be US$9 million, of which US$5 million is attributed to the railway of 15km length, and US$4 million is for development in the SEZ.

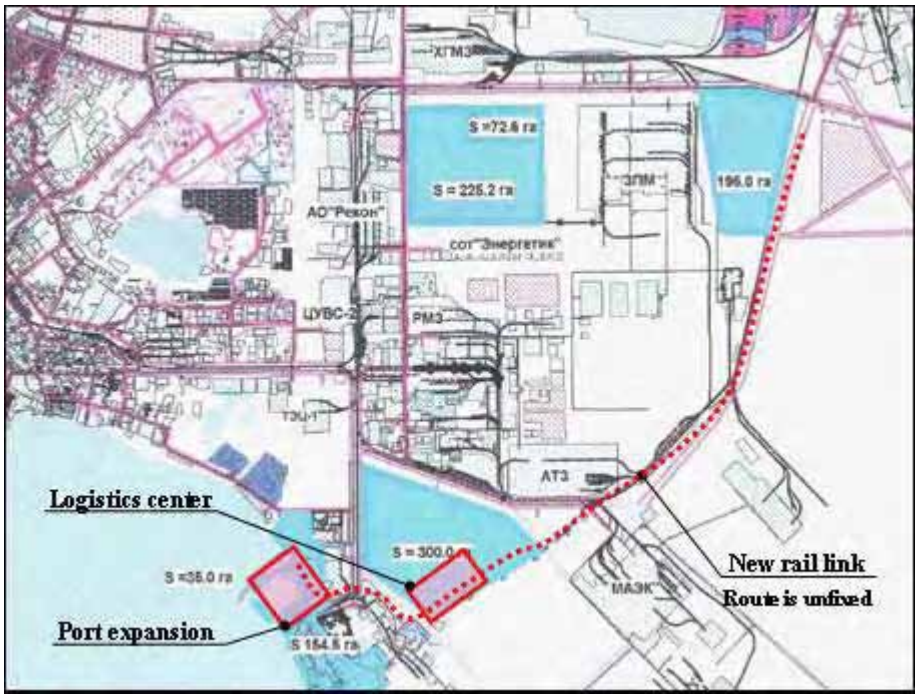


Figure 7.7 Location of New Rail Link to Aktau Port via SEZ

4) Yeralievo station-Kuryk port new line

This is a new rail link of 14.4km connecting the Yeralievo station to the Kuryk port to be developed. The railway will serve the transport of oil, raw materials and products from/to factories in the Kuryk port complex to be established. The freight demand is estimated to be 5.5 million ton per year initially. The project cost is estimated to be US$63 million, which the Karaikimunai oil enterprise is expected to cover.

5) Mangistau-Bautino new line

The Bautino port at present is used mainly as a base port for equipment transport by Agip KCO, which is exploring offshore oil fields. It is expected to be used to ship the oil from the Caspian Sea to the Aktau port at the time when commercial production starts around 2009. It may be used to ship oil to the Kuryk port as well. Linking the Bautino port to the trunk railway route will ensure redundancy of oil export in case of problems occurred in the main export route. The Bautino port will also provide passenger and freight services to the Fort Schevchenko and Bautino area. The freight demand is estimated to be 7.5 million ton per year initially. To enhance these transport activities, feeder connection to the trunk railway route is desired. Furthermore the area along the new line has good potential for livestock and other agricultural production. The new line will significantly help promoting those agricultural and agro-processing industries. The rail length is 135km, and the project cost is estimated at US$189 million.

7.2.3 Ports and airports development

(1) Development concepts

As the oil production in the northern Caspian Sea is expected to be increased significantly, port functions in the Mangistau Oblast need to be much strengthened not only for oil export and import and export of oil-related equipment, materials and products but also to support the development of linkage industries and the improvement of livelihood. Moreover, port functions of Mangistau are

expected to support the logistic functions of Kazakhstan as a whole, which are essential in serving the transit demand of general freight including containerized cargoes that are expected to increase rapidly.

To accommodate the rapidly increasing passenger demand, the airport functions in Mangistau need to be upgraded as well. The increase in passenger demand would accelerate in the medium term as Mangistau develops its high potentials for tourism including conference tourism, adventure tourism and cultural tourism among others. Moreover, as the Mangistau economy develops, increasing high value products of new industries would start to export by air, and a variety of goods would be imported to cater for high end demand of international tourists.

Existing port and airport facilities should be reinforced to meet the demand of oil and related industries and other services especially in Aktau and Fort Schevchenko/Bautino. New facilities should be developed to cater for emerging needs in Kuryk and Sarytash as currently planned. Additional port and airport facilities may be provided to meet specific requirements of local economies and livelihood such as airport facilities for tourism and fishery ports for individual fishermen.

(2) Major projects

Aktau port expansion

The project will expand the capacity of existing port to handle freight twice as much as the present capacity. The oil shipment capacity will increase from 10 million ton to 20 million ton annually. The project cost is estimated to be US$230 million except the portion already built as basic infrastructure and committed in past, which will be supported by a loan from EBRD. The project consists of provision of additional breakwater, dredging sea-lanes, provision of stockyard for freight, and construction of berths comprising four oil berths, two container berths, two banker berths and a berth for national border guard. Master planning and detailed design have been carried out for 18 months since June 2007, including the preparation of tender documents. A latest feasibility study recommends that two oil berths, which are provisional for full scaled four oil berths, will be needed by 2010 at least, and also shows the necessity of grain berth around 2014 and dry cargo berth around 2017.

As part of the ongoing master planning, the previous master plan emphasizing oil berths in the port expansion should be carefully reviewed. The Aktau port should be specialized more in handling general freight including transit container cargoes after the Kuryk port is completed together with the BTC oil pipeline. A feasibility study should be carried out to convert the oil berths to general freight berths, including the establishment of rail connection to the present oil berths.

Aktau international airport upgrading

After more than 30 years since the construction, the passenger terminal and other facilities of the Aktau international airport have been over-aged. The existing facilities cannot handle properly even the existing passenger and service demand. For instance, the runway does not fit the international standard for safety regulations. The project has two major components: runway extension and rehabilitation of passenger and freight terminals. For both of them, implementation by concession for 30 years has been adopted. The project cost is estimated to be US$201 million, which will be funded by the airport's own fund, and a loan from Kazkommertsbank. The Oblast has set aside US$10 million in the regional budget for the new terminal. The project components are summarized in Table 7.5.

Table 7.5 Project Outline of Aktau International Airport

Project	Expected capacity	Investment cost (US$10^6)
Reconstruction of main runway	3850×60m	
To accept Boeing 747 class jet takeoff		160
Construction of new passenger Terminal	350 passengers/hour capacity; 200 passengers for international flight and 150 for domestic flight	41

Source: International Aktau Airport, JSC

The construction work for the freight terminal started in February 2007 by concession. The passenger terminal construction is expected to follow for completion in 2008 and operation to start in 2009. The improvement of the runway is expected to start only after 2009 due to financial situation. Even after the expansion, the terminal capacity may be reached around 2020, if the present growth of passenger demand continues. It is recommended that a new expansion plan be prepared after the completion of the new runway.

Kuryk port development

The project is to establish a new port to export 60 million ton of oil from the northern Caspian Sea. The development plan for the Kuryk port complex to be established in the Kuryk village has already approved. Taking advantage of the deep-water harbor of 8-10m depth, oil berths can be constructed for 15,000t class tankers. The port will be utilized also for the export of products from industries related to oil and gas production and transshipment of import products. The project cost is estimated to be US$2,011 million for both industrial infrastructure and transport infrastructure as shown in Tables 7.6 and 7.7. The new railway development from Yeralievo to Kuryk will be implemented in advance.

Table 7.6 Expected Industrial Infrastructure for Kuryk Port Complex Development to Be Installed

Facility Name	Estimated investment cost (US$10^6)
1. Supporting base of sea oil operations	26.5
2. Ersai Caspian Shipyard	101.0
3. Kuryk oil terminal	433.9
4. Shipyard for repairing/building	86.0
5. Installation of complex preparation of oil and gas (UKPNG)	287.7
6. Terminal of Liquid gas	70.0
7. Fleet base of Kazmortransflot	19.4
8.Emergency base	45.0
9.Ecological mooring	5.0
Total infrastructure	1074.5

Table 7.7 Transport Infrastructure for Kuryk Port Complex Development

Facility Name	Outline of the facility	Estimated investment cost (US$10^6)
1. Railway (Yeralievo station to Kuryk)	14.4km	26.5
2. Motorroad of Aktau-Kuryk	60.0km	101
3. Motorroad of Yeralievo station to Kuryk	14.0km	433.9
4. Motorroad of Zhetybai-Kuryk	65.0km	86
5. Coastal road	9.0km	-
6. Village road	64.0km	287.7
Total		935.1

Source: Program of Complex Development of Seaport Kuryk and Kuryk Village of Karakia Rayon

Bautino port expansion and Sarytash port development

Additional port facilities have been provided next to the original port of the Agip KCO company to handle materials for oil drilling in off-shore oil fields. A ship maintenance workshop, breakwater, berth and dredging are under construction. These construction works are being carried out by joint ventures of Dubai companies and two Kazakhstan companies specialized in oil production and marine transport. The total project cost is estimated to be US$80 million, which would be supported by a loan from EBRD. Other plans prepared by Kazakh oil companies for the Bautino port expansion exist, but details are not determined. The oil export is also expected from the Bautino port in the future, but the oil handling capacity is limited at about 5 million ton annually.

The Sarytash new port is planned by a consortium of more than 60 companies as the oil shipment base. The plan has been approved by the Government, and the construction is expected to start in 2008. The access road from Tauchik to the port has been developed earlier as a Category IV road. The project including the transport infrastructure is estimated to cost US$500 million, of which about US$300 million are for the port itself. The railway development from Shetpe to Bautino, passing through near the Sarytash port is also planned in connection with the port development, but details are still to be worked out.

7.2.4 Aktau city development projects

(1) Background

As the capital city of Mangistau Oblast, Aktau is expected to play key roles in the regional development. Many projects to be implemented in Aktau have been identified in other sub-sections of this report, especially for the economic development such as industry and tourism, some strategic components in the field of human development and social infrastructure such as higher education, and environmental protection. Successful development of the Oblast largely relies on successful implementation of projects to be taken place in the Aktau city. These projects have to be implemented in a sustainable manner in harmony with the lives of citizens. Thus it is important to focus on how to ensure the quality of life in the development of Aktau city, which can be represented by the livelihood of the citizens and the physical living environment of the city such as housing.

(2) Living conditions

Urban livelihood

There have been constant growths of employment in recent years with better wages in most of the economic sectors. The nominal average monthly wages in January-December, 2006 was 73,683 tenge (KZT 73,683), showing growth of 16.5% from the performance in 2005. In period of January-June, 2007 the monthly average wages of one worker was KZT 78,829, increased from the similar period of 2006 by 17.3 %. These high levels of growth in average wage, however, were largely brought from the performance in some lucrative sectors such as finance and insurance services (KZT 229,577 in 2006), together with medium to large-scale enterprises in other sectors (KZT 76,474, which accounted for 25.5% of the total employment. Wide discrepancies are observed from the wages of low-income sectors, such as agriculture, social services and government employees, which accounted for 22.2% of the total number of employment in 2006 with average monthly wage of KZT 12,583. Also, there are households depending on pensions and welfare, as well as part-time jobs and informal self-employment. As of 2005, around 14 % of the population lived on income below the minimum wage.

Household finance

There are 16 banks operating in the city; one first level bank (joint-stock company "Petrobank", and 15 second level banks. Although it is expected that these banks provide credits for economic activities of citizens, such as starting of small business and construction of detached houses, people tend to avoid using their services due to high interest rates especially in recent years reaching nearly 20% for short-term credits. Instead, Aktau citizens collect necessary funds from their relatives and acquaintances, mostly basing on their properties as collateral security.

Housing

The policy of housing supply in Kazakhstan shifted from the direct provision of apartment units by the government to the individual construction of detached houses on the land plots provided by the government free of charge. In Aktau, provision of these land plots has been concentrated in the suburban areas, especially to the areas near the Mangishlak railway station (now in Munailinskii rayon) as well as the coastal areas to the north. In 2006, there was investment of KZT 7 billion in housing construction for 166,700m^2 of housing floor. Among them, KZT 4.4 billion, or 63% of total housing investment, was made by households. Housing investment by the government accounted for 17.9%. From 2003 to 2006, more than 487,000m^2 of residential floor was constructed, which accounts for 71 % of the total residential floor built in the same period.

The shortage of housing is a serious problem in the Aktau city, which reportedly is a cause for divorce of many young couples. The free provision of housing land plots has not kept pace with the demand growths. Plus the location of these land plots is increasingly becoming away from the center of Aktau city, largely stretching to Tupkaragan for more than 15km range. This is causing a spread of housing area without provision of proper infrastructure and utilities services.

Amenity and city beautification

Planting of trees in the public space is funded by the local government. Starting in 2004, tree planting along highways was initiated. In the end of 2007, there were 3,549 trees planted along highways on the area of 1.06ha. Regarding the solid waste management, collection of wastes has been sufficiently functioning except for some areas.

(3) Existing policies on urban management

After its establishment in 1963, the Aktau city has been constructed in accordance with a spatial development plan (General Plan), which has been revised twice in the past to reflect the change in socio-economic conditions of the city, as well as the policy changes in the central government. The latest General Plan of Aktau city was approved in 2005, revising the previous plan formulated in 1983. The current General Plan provides guidelines for physical development projects, covering development of new urban complex, town zoning, public facilities, and infrastructure and utilities construction, for the following planning periods:

- Conceptual development plan, up to the year 2030
- General Plan for the settlement area, up to the year 2020

The most important decisions brought by the latest General Plan include i) establishment of the New Aktau City, and ii) expansion of SEZ. The former was introduced to solve the social problems such as the shortage of housing, as well as to accommodate some strategic issues such as enhancement of higher education, provision of high-grade business district, and modern tourist districts, in a comprehensive manner. The latter was to provide space for manufacturing industries to be invested in and located at the capital of Mangistau Oblast. After the authorization of the General Plan, detailed planning was carried out by the respective project owners: KazEmir

for the New Akrau City, and Morport Aktau for the SEZ (Figure 7.8).

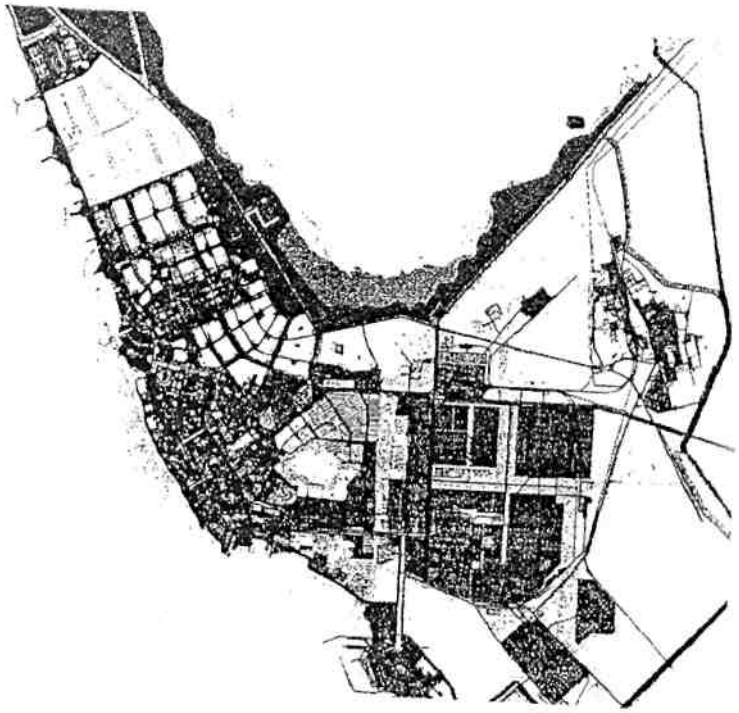


Figure 7.8 General Plan of Aktau City

(4) Issues on securing quality of life

Considerations on the New Aktau City development

The development of the New Aktau City seems on the track. The primary project owner is Kazemir Aktau, founded as a joint venture between Kazakhstan and The United Arab Emirates (UAE), and currently the largest property sector investor in Kazakhstan. In 2007, Saraya group, a UAE based real estate investor based on the global strategy for travel and tourism business joined to the project. As a master developer and land owner, Kazemir Aktau entrusted Millennium Development International, a subsidiary of Saraya Holdings, on the development management of the project, which in turn assembled a group of highly acclaimed international experts from USA, France, UK, Hong Kong, UAE and Lebanon in the fields of development management, master planning, engineering, environmental planning, architectural design, financial planning, legal, finance, marketing and sales to prepare the development strategies for the Project. The project was inaugurated in September, 2007, in the presence of the President of Kazakhstan with attendance of the Minister of Foreign Affairs of UAE.

The finance of the project relies largely on the so-called petrodollars, reinvesting by using the massive return gained from many real estate investment projects taking place in Dubai and other parts of the world. The future of the project, therefore, will be influenced by the trend of international crude oil market price, as well as property market in the major cities where those projects of key players for the Aktau New City are located. Nonetheless funding of the project seems rather stable judging from the size of the petrodollars as a mass.

Considerations on the future risk of existing residential area

The Aktau city will face a significant change of its urban structure led by the development of the

New Aktau City and expansion of the SEZ, along with major transport infrastructure developments and constant inflow of migrants. Along with the progress of development in both project areas, the commutes and business traffic will be generated, which mostly passes through the existing residential areas.

At the same time, some micro-districts constructed at the earliest stage of the city's development have been increasingly deteriorated. If fact, those early numbered micro-districts, such as MD-1, 2, 3, 3a and 3b, have already experiencing deterioration of facilities. These blocks are composed by relatively low density with low-rise structures.

Given the factors described above, along with the increase in supply of housing and office spaces by the progress of the Aktau New City development, the property value of the existing residential area will necessarily be affected. The current high property value led by the investment in oil and gas extraction industry, among other causes, makes solving the housing shortage problems more difficult. At the same time, many economic activities are going on based on the current high property prices. The large fluctuation of the property value in the existing residential area should be avoided in a pro-active manner.

(5) Need for upgrading of the existing residential area

To meet the housing demands by the local residents, it is not sufficient to rely on the supply by the construction of the New Aktau City, as the projects aims at a development of high-grade districts, which may not be affordable to the majority of local residents. At the same time, depreciation of property value for the old Soviet type apartments may take place after some time of the completion of initial stage development of the New City, as foreign expatriates and some local families would move to the new area. Since there is significant number of residents running business funded basing on their property, the sharp depreciation of property value should be avoided. To cope with these requirements the following measures should be introduced:

- New apartment type housing units should be provided in the existing built-up areas utilizing existing infrastructures.
- Pace of the provision of free land for Kazakh nationals should be slowed down to meet the schedule of infrastructure/utilities provision.
- Deteriorated blocks should be revitalized by provision of higher urban functions with higher spatial efficiency by redevelopment of some existing aged buildings.

(6) Recommended projects

The upgrading and revitalization of the existing built-up areas is necessary, aiming at a restructuring of urban spaces. A series of studies should be carried out to determine the details of the project. These studies include:

1) Projection of housing demand and supply,
2) Forecasting of property prices to be supplied by the New Aktau City,
3) Identification of deteriorated blocks and building facilities to be upgraded,
4) Identification of functions to be introduced in the project area,
5) Formulation of relocation program for existing residents,
6) Formulation of a redevelopment master plan for the project area,
7) Formulation of financial arrangements by using the project finance scheme, and
8) Invitation of private investors/developers to match the concept of providing affordable housing for on-site and ordinary citizens.

Preliminary ideas for the priority project

As pointed out earlier, micro-districts of No. 1, 2, 3, 3a and 3b were constructed in the initial stage of the development of Aktau. Among them, MD-3b accommodates a polytechnic school, among others, thus making up this and surrounding micro-districts to be widely recognized as students' blocks. There are some distinctive cafes and restaurants located in these blocks, creating a cozy atmosphere. The building facilities, however, are aged and increasingly deteriorated. Moreover these areas are becoming to be known as dangerous micro-districts recently, caused by occasional violence and unlawful activities.

These blocks are located in the eastern edge of the existing residential area, adjoining to the industrial zone where rapid development is expected by the success of the SEZ. Thus these blocks are ideal housing location for the workers of factories to be located in the SEZ. It offers ideal location also to accommodate a public transport station to connect the industrial zone and residential zones including the area of New Aktau City. At the same time, all or some parts of the functions of polytechnic school may be relocated to the New Aktau City area along with the establishment of the Caspian State University of Technology and Engineering.

Given the above, a pro-active upgrading of these districts is recommended. Possible functions to be introduced in the upgrading project include:

- Affordable housing for low to middle income groups,
- Dormitory type rented apartments for students,
- Several vocational schools,
- Bus station and taxi pool space,
- Plaza and parks surrounded by cozy cafes and restaurants,
- Amusement facilities and playgrounds for children,
- Modern supermarket and shopping complex, and
- A pedestrian walkway network connecting the bus station and core functions from the seaside.

It should be noted that almost all the existing residents would expect to live in the original location continuously. Thus a relocation program should be firstly formulated in accordance with the survey results of the existing residents' wishes. An apartment building with affordable units firstly will have to be constructed on a vacant land very close to the existing low-rise housing facilities for tentative or permanent relocation according to the residents' wishes. These procedures of urban renewal have been well developed in Japan and other nations, which experienced reconstruction of aged public housing facilities for many years.

Annex to Section 7.2: Traffic Demand Analysis

Future demand of passengers and freight is estimated by mode. First, the demand of passengers and freight is estimated for the airport, ports and railways. Second, the generation of car traffic is estimated based on the projected demand. Finally, the generated traffic is distributed to traffic zones defined for the purpose, and further allocated to road sections in accordance with possible traffic generation and attraction by the airport, ports and railway stations. The procedure is illustrated in Figure 7.A.1.

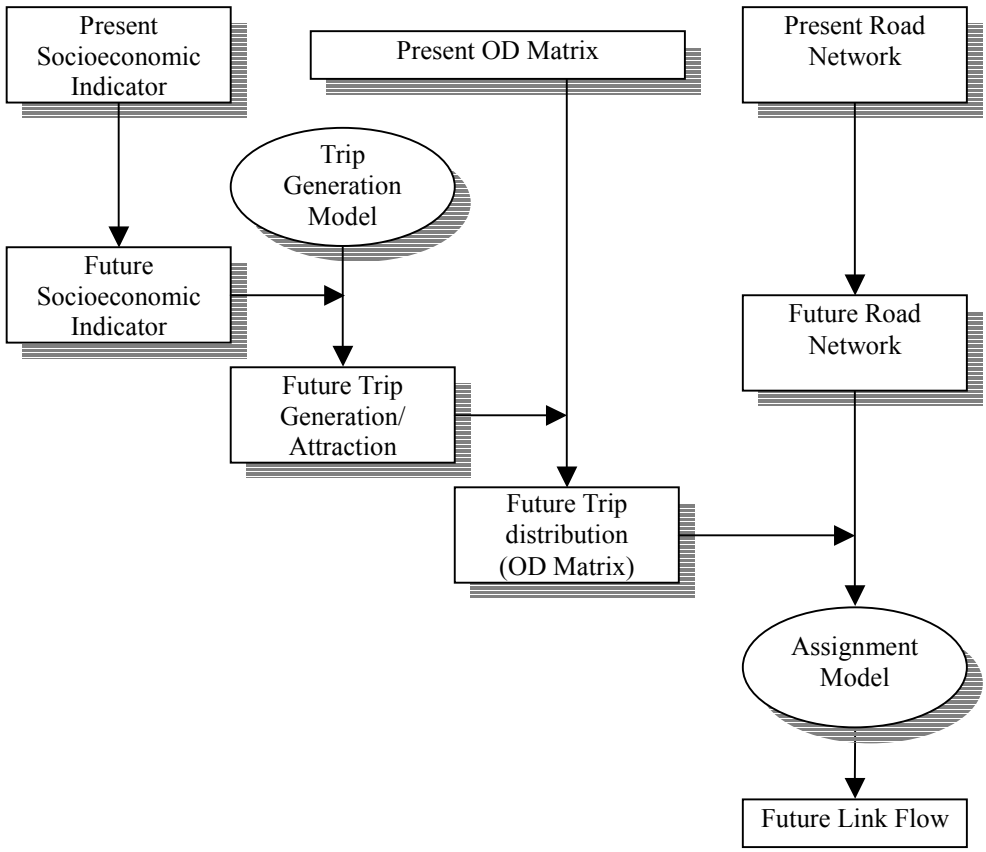


Figure 7.A.1 Future Demand Estimate Process

7A.1 Airport passenger and freight demand

(1) Demand projection

The number of passengers at the Aktau international airport reached a peak of 281,000 persons in 1995, and then declined to 75,500 in 2002. As the Oblast economy developed, the passenger demand increased at the average annual rate of 23% during 2002-06 to reach 174,900 in 2006. The amount of air cargoes handled at the airport increased at the average annual rate of 15% during 2002-06 to reach 3,357t in 2006.

The average annual growth of the GDP of Kazakhstan is forecasted to be about 8%, and the Government assumes the rates of increase in air transportation at 10% for international and 12% for domestic transport annually. In the present Study, the rate of increase in air transport is assumed at 10% per annum up to 2015. The passenger and cargo traffic would thus increase to 412,000 persons and 7,900t in 2015.

(2) Assessment of airport facilities

Airport facilities would have to be planned in accordance with the standards by the International Civil Aviation Organization (ICAO). By the standards established by the USSR, the Aktau airport is classified as a Category B airport (Table 7.A.1). The capacity of airport facilities is evaluated by reflecting peak-day and peak0hour ratios determined from current operation of the airport. The peak-day ratio is 17% over a week, and the peak-hour ratio is taken to be 15% at the Aktau airport.

Table 7.A.1 Categorization of Airports in Kazakhstan

Class	Runway (m)	Airport
A	3,200	Almaty, Karaganda
B	2,600	Aktau, Aktyubinsk, Kyzyl-Horde, Zhambul, Zhezkazgan, Semipalatinsk, Shimkent
V	1,800	Atyrau, Uralisk, Almola, Pavlodar, Arkalyk, Balhash, Kostanay, Kokshetau, Petropavlovsk, Taldy-Burial, Mouth-Kamenogorsk, Ekibastuz
G	1,300	-
D	1,000	Burunday
yeh	500	-

Source: International Aktau Airport JSC

The expansion plan for the Aktau airport will expand the passenger handling capacity to 350 persons per hour, consisting of 200 domestic and 150 international passengers. The number of aprons required is estimated to be three. The airport facilities utilization ratios in 2015 are calculated to be 60% for passenger terminal, 66% for domestic and 47% for international, and 76% for aprons (Table 7.A.2). Thus, the expansion plan seems appropriate.

Table 7.A.2 Assessment of Airport Facilities Utilization

	Passengers (both)		Aircraft movement
	Domestic	International	(one-way)
Annual volume	269,700	142,700	5,780
Peak-day volume	880	470	19
Peak-hour volume	132	71	3
Planning	200	150	4

Note: include charter flight which is about 10% of regular flight

If the number of passengers continues to increase at 10% per year, however, the capacity of passenger terminal would be saturated after 2015, when the passenger demand reaches 700,000 as predicted by the Government earlier for 2015. Further expansion of the Aktau airport would be necessary after 2020.

(3) Traffic generation by the airport

The traffic generation by the airport is estimated by assuming that air passengers use passenger cars, and air cargoes and airport staff are carries by trucks. The average number of passengers per car and the average load per small truck are determined based on the results of the traffic survey. The number of airport staff is as shown in Table 7.A.3.

Table 7.A.3 Number of Airport Staff

Department	No. of staff
Office and management personnel	24
Aerodrome and surface facilities exploitation service	17
Aviation-engineering service	36
Maintenance	25

Department	No. of staff
Logistic support	3
Medical-health-hotel service	12
Communication service	6
Combustive lubricating materials service	34
Flights lighting technical support service	19
Aviation safety service	73
Flight's search and emergency rescue support service	22
Special motor transport service	77
Heat engineering and sanitary technical support service	28
Transportation service	70
Production dispatching service	11
Total	457

Source: International Aktau airport JSC

The traffic from the airport is estimated to be about 1,000 vehicles per day at present. The traffic generation/attraction by the airport is projected to become 2,150 vehicles by 2015 as detailed in Table 7.A.4.

Table 7.A.4 Traffic Generation/Attraction at Aktau Airport

Vehicle type	Sort	Per unit	Present		2015		Note
			Pas/crg	Veh.	Pas/crg	Veh.	
Passenger car	Flight passenger	1.4 person/veh.	570	814	1,350	1,928	Survey results
	Airport staff	2.4 person/veh.	457	190	457	190	Survey results
Truck	Cargo	1.6t/veh.	11.0	14	24.6	30	Survey results
Total	-	-	-	1,018	-	2,148	-

Note: Assumption about the airport staff is that it would remain the same as present.
4t truck × 40% (loading ratio) = 1.6t/veh.
No. of passengers/passenger car = 2.4 including the driver
No. of vehicles = (passengers/unit) × 2 (both)

7A.2 Aktau port freight demand

(1) Freight demand projection

The amount of cargoes handled at the Aktau port increased at the average annual rate of 20% during 1990-2005. Oil is the dominant cargo, but the oil handling capacity is 8-10 million ton per year, which was exceeded in 2004. The expansion plan supported by the EU fund is expected to double the handling capacity for completion around 2011. According to the forecast by EBRD, the amount of freight to be handled at the port would be 24.7 million in 2015, of which oil accounts for 20 million ton (Table 7.A.5).

Table 7.A.5 Port Cargo Trend and Future Demand

(Unit: 1000t/year)

Commodity	1999	2000	2001	2002	2003	2004	2005	2010	2015
Oil	2,067	3,386	5,035	5,552	6,971	8,289	8,913	9,000	20,000
Metal	235	702	1,060	571	836	1,012	1,025	1,250	1,550
Grain	8	20	84	209	5	13	33	1,500	1,500
Others	38	43	23	23	23	34	71	520	1,295
Ferry cargo		26	199	593	246	345	350	350	350
Total	2,348	4,175	6,402	6,948	8,080	9,692	10,393	12,620	24,695
growing rate(%)	-	78	53	9	16	20	7	4	14

(2) Transport mode by commodity from/to the Aktau port

It is reported that about 60% of oil handled at the Aktau port is transported by rail and the remaining 40% by pipelines. The capacity of oil pipelines to the port from Karazanvas and Uzen is about 13 million ton a year. The structure of commodity transport by mode is shown in Table 7.A.6

Table 7.A.6 Commodity Transport by Mode of Transportation in 2015

Commodity	Modal share (%)				Note
	Pipeline	Railway	Truck	Others	
Oil	40.0	60.0	0.0	0.0	Present share
Metal	0.0	84.5	15.5	0.0	WB report
Grain	0.0	21.5	78.5	0.0	WB report
Others	0.0	21.5	78.5	0.0	WB report
Ferry cargo	0.0	21.5	78.5	0.0	WB report
Total	32.4	56.6	11.0	0.0	Weighted avg.

Source: Transport Sector Strategy Policy Notes, World Bank, March 2006
Investor's guide 2005, Transport and Communication network

(3) Assessment of Caspian seaport facilities

According to the Country strategy for oil products, about 100 million ton of oil products will be transported throughout the Country, of which 60 million ton will be produced in the western Kazakhstan. Of this amount, 38 million ton will be exported from the Caspian seaports. The Aktau port alone cannot handle the oil export even with the expansion. The expansion for oil export is constrained by the limited space and the need to handle other cargoes for the SEZ.

At present, the Kuryk port development, expansion of the Bautino port, the new port at Sarytas and associated pipelines development are planned and partly implemented to expand the oil handling capacity in the Caspian Sea. While the Aktau port expansion will strengthen the function to handle general cargoes including containerized cargoes, the infrastructure for oil export to complement the Aktau port needs to de developed urgently for completion by 2015.

(4) Traffic generation by the Aktau port

The traffic generation by the Aktau port is projected for trucks to carry cargoes and passenger vehicles for commuting staff. The following formula is applied.

$$\text{Designed traffic demand} = \text{Annual freight volume} \times \frac{\alpha}{W} \times \frac{\beta}{12} \times \frac{\gamma}{30} \times \frac{1+\delta}{\varepsilon}$$

Where W: Actuary loading cargo volume (t/car)
α: Car modal share = car traffic volume / all mode traffic volume
β: Monthly variation rate = peak-month cargo volume / average monthly cargo volume
γ: Daily variation rate = peak-day cargo volume / average daily cargo volume
δ: Related to car rate = number of related car / total number of truck
ε: Actual loading rate = number of truck with loading / total number of truck

Parameter value is set according to the data in Tables 7.A.7 and 7.A.8. In the projection, transport of oil by truck is not considered. The commuting traffic is projected assuming that the number of port staff will increase from 470 at present to 700 in 2015. The average number of passengers per car and the average load per truck are determined based on the results of the traffic survey conducted near the port. The total number of vehicles is projected to increase from 630 at present to 2,250 in 2015 as shown in Table 7.A.9.

Table 7.A.7 Truck Volume Forecast

Present 2005	Annual volume (ton/year)	W (ton/car)	Parameter					Traffic volume (veh./day)
			α	β	γ	δ	ε	
Metal	1,025,000	18.0	0.155	1.2	1.2	0.5	0.5	106
Grain	33,000	18.0	0.785	1.2	1.2	0.5	0.5	17
Others	71,000	18.0	0.785	1.2	1.2	0.5	0.5	37
Ferry Cargo	350,000	18.0	0.785	1.2	1.2	0.5	0.5	183
Total	1,479,000							344

Future 2015	Annual volume (ton/year)	W (ton/car)	Parameter					Traffic volume (veh./day)
			α	β	γ	δ	ε	
Metal	1,550,000	18.0	0.155	1.2	1.2	0.5	0.5	160
Grain	1,500,000	18.0	0.785	1.2	1.2	0.5	0.5	785
Others	1,295,000	18.0	0.785	1.2	1.2	0.5	0.5	678
Ferry Cargo	350,000	18.0	0.785	1.2	1.2	0.5	0.5	183
Total	4,695,000							1,806

Table 7.A.8 Passenger Car Volume Forecast

Vehicle type	Object	Per unit	Present		2015		Note
			Pas/crg	Veh.	Pas/crg	Veh.	
Passenger car	Port staff	3.2 persons/veh.	470	290	700	440	Survey results

Note: Per unit based on the results of Traffic Survey;
No. of vehicles = (Passengers/unit) × 2 (both directions)

Table 7.A.9 Summary of Car Volume Generated by the Aktau Port

Vehicle type	Present (veh./day)	Future (veh./day)
Passenger car	290	440
Truck	340	1,810
Total	630	2,250

7A.3 Railway freight demand

(1) Freight volume projection by region in Mangistau

Of the five railway stations in Mangistau Oblast, three stations can handle the container freight: Mangistau, Aktau port and Uzen. No facilities exist at these stations to transfer general cargoes to trucks. As the containerized freight is expected to increase rapidly for efficient shipment, facilities for transfer of general freight from trains to trucks need to be developed to strengthen the container handling function at the railway freight stations.

The amount of railway freight from/to Mangistau Oblast is 14.4 million ton/year, and it is expected to increase to 32.6 million ton in 2015 (Table 7.A.10). Of the total freight volume, about 80% is for export and import, while 20% is local demand in Mangistau (Table 7.A.11). Most export and import demand are handled at the Aktau port, and other domestic demand is handled at the Mangishlak, Beineu, Shetpe and Uzen stations.

For the projection of railway freight, the distribution between domestic and international freight volume is assumed to be the same in the future as the present. Also, the freight composition is assumed to be the same in 2015 as the present shown in Table 7.A.12). Coal, mineral and oil are transported mainly as bulk cargoes, and other commodities are transported as general cargoes including containers. Overall, 75% of railway freight is bulk cargoes.

Table 7.A.10 Railway Freight Demand in Mangistau

Unit: 1000t/year

Type	Present	2015	Growth rate (2015/present)
Dispatch	7,904	16,011	2.0
Arrival	6,487	16,570	2.6
Total	14,391	32,581	2.3

Source: Study on integrated logistics system and marketing action plan for container transportation, JICA study team

Table 7.A.11 Domestic and International Freight Volume by Railway in Mangistau

Unit: 1000t/year

Share	Present	2015	Notes
Domestic	3,384 (23.5%)	7,178 (22.0%)	All freight of railway sta. except Aktau port sta.
International	11,007 (76.5%)	25,403 (78.0%)	Mainly, Aktau Port sta.
Total	14,391 (100.0%)	32,581 (100.0%)	

Table 7.A.12
Railway Freight Composition for Domestic and International Freight in Mangistau

Item	Domestic (%)	International (%)
Coal	49.0	37.0
Mineral	19.0	20.0
Oil	7.0	19.0
Construction materials	9.0	0.0
Grain	1.0	6.0
Others	15.0	18.0
Total	100.0	100.0

Source: JICA Logistics Study Team

Most bulk cargoes, typically oil, are transported to a plant or factory by exclusive feeder lines from railway yard for efficiency. The general cargoes have potentials to be containerized and carried by trucks from railway stations. The analysis here focuses, therefore, on general cargoes and freight demand at each railway station. The railway freight volume by commodity at present and its projection for 2015 are summarized in Table 7.A.13. The total amount of freight is allocated to railway freight stations in proportion of population in the respective hinterland as shown in Table 7.A.14.

Table 7.A.13 Railway Freight Volume by Commodity in Mangistau

Unit: 1000t/year

Item	Domestic		International	
	Present	2015	Present	2015
Coal	1,658	3,517	4,073	9,399
Minerals	643	1,364	2,201	5,081
Oil	237	502	2,091	4,827
Construction materials	305	646	0	0
Grains	34	72	660	1,524
Others	507	1,077	1,981	4,573
Total	3,384	7,178	11,007	25,403
Bulk cargo	2,572 (76%)	5,455 (76%)	9,026 (82%)	20,830 (82%)
General cargo	812 (24%)	1,723 (24%)	1,981 (18%)	4,573 (18%)
	Mangishlak, Shetpe, Beineu, Uzen sta.		Mainly, Aktau Port sta.	

Notes: Bulk cargo includes coal, minerals and oil; general cargo includes construction materials, grains and other; general cargo also includes container style.

Table 7.A.14 Estimate of Railway Freight Volume by Railway Station in Mangistau

Unit: 1000t/year

Station	Hinterland	Population	Share	General cargo	
				Present	2015
Mangishlak	Aktau city	194,300	49.8%	404	858
Shtepe	Mangistau rayon				
Tupularagan rayon	45,600	11.7%	95	201	
Beineu	Beineu rayon	39,900	10.2%	83	176
Uzen	Zhanaozen city				
Karakiyan rayon	110,300	28.3%	230	488	
Aktau Port	Foreign country	-	-	1,981	4,573
Total	390,100	100.0%	2,793	6,296	

The containerized cargoes at present constitute only 9.4% of the total railway freight for general cargoes. Since about 80% of all the cargoes is minerals such as coal and oil, it is difficult to increase this ratio although 55% is targeted for the Country as a whole. For the projection, it is assumed that containerized cargoes will occupy 17% of all the railway freight in 2015. The amount of containerized cargoes is projected to increase from 263,000t per year at present to over 1.0 million ton in 2015 (Table 7.A.15). This corresponds to the increase in the number of containers from 17,530 TEU at present to 71,330 TEU in 2015 (Table 7.A.16).

Table 7.A.15
Containerized Railway Freight Volume by Railway Station in Mangistau

Unit: 1000t/year

Station	General cargo			
	Present		2015	
	Total	Container (9.4%)	Total	Container (17.0%)
Mangishlak st.	404	38	858	146
Shetpe st.	95	9	201	34
Beineu st.	83	8	176	30
Uzen st.	230	22	488	83
Aktau Port st.	1,981	186	4,573	777
Total	2,793	263	6,296	1,070

Table 7.A.16 Container Volume by Railway in Mangistau

Unit: TEU/year

Station	Container volume			
	Present		2015	
	Ton	TEU	Ton	TEU
Mangishlak st.	38,000	2,530	146,000	9,730
Shtpe st.	9,000	600	34,000	2,270
Beineu st.	8,000	530	30,000	2,000
Uzen st.	22,000	1,470	83,000	5,530
Aktau Port st.	186,000	12,400	777,000	51,800
Total	263,000	17,530	1,070,000	71,330

Average weight of 20ft container: 15t/TEU
(Maximum weight regulation is about 30t/TEU)

(2) Assessment of railway facilities

Most terminal facilities at railway freight stations are not improved to handle containers and transfer cargoes to trucks as the demand is very limited. Even at the Mangishlak station with the

largest number of containers handled except the Aktau port station, the demand is less than 10 TEUs per day on average. Generally, there is only a platform for freight handling at freight stations outside Aktau. As the demand for containers to be handled at these stations is projected to increase by 3.8 times by 2015, however, the container terminal and transfer function would need to be enforced.

(3) Traffic generation by railways

To calculate the traffic generated by railways, the number of containerized cargoes is converted to the number of trucks by one truck per 1 TEU and the average freight load per truck is set for other general cargoes based on the results of the traffic survey. The number of trucks for general cargoes is thus calculated to be about 100 per day at present except those from the Aktau port, of which about 60 vehicles are generated from the Mangishlak station. This is projected to increase to 270 vehicles per day in 2015 (Table 7.A.17).

Table 7.A.17 Truck Volume at Each Railway Station

Present	Container		Except container		General cargo	
	Freight (TEU)	Truck (vehicle)	Freight (ton)	Truck (vehicle)	Truck volume (per year)	Truck volume (per day)
Mangistaushlak	2,530	2,530	366,000	20,330	22,860	63
Shetpe	600	600	34,000	1,890	2,490	7
Beineu	530	530	30,000	1,670	2,200	6
Uzen	1,470	1,470	83,000	4,610	6,080	17

2015	Container		Except container		General cargo	
	Freight (TEU)	Truck (vehicle)	Freight (ton)	Truck (vehicle)	Truck volume (per year)	Truck volume (per day)
Mangistaushlak	9,730	9,730	712,000	39,560	49,290	135
Shetpe	2,270	2,270	168,000	9,330	11,600	32
Beineu	2,000	2,000	146,000	8,110	10,110	28
Uzen	5,530	5,530	405,000	22,500	28,030	77

7A.4 Road traffic demand

(1) Demand forecast model

The road traffic demand is forecast by following the procedure illustrated in Figure 7.A.1. First, a trip generation model is developed to generate future trip generation/attraction. Second, the future trips are distributed into a future OD matrix to be constructed based on the present OD matrix estimated by the traffic survey. Then, the future traffic demand with OD is assigned to road sections of the future road network.

(2) Trip generation/attraction

The trip generation model was constructed based on the present traffic generation/attraction and the population distribution. Future trip generation/attraction is estimated by applying the model to the future socioeconomic indices. The vehicle trip generation/attraction in 2007 and 2015 is compared in Table 7.A.18. The trip generation/attraction by zone is derived by dividing respective trip generation components with the population and the GRDP as relevant.

Table 7.A.18 Comparison of Generation/Attraction Volume, 2007 and 2015

Zone	2007 (vehicles/day)	2015 (vehicles/day)	Growth rate (future/present)
City Aktau	8,968	16,504	1.8
City Zhanaozen	3,768	7,338	1.9
Beinau	1,316	3,832	2.9
Oporny	560	1,824	3.3
Shetpe	1,918	3,292	1.7
Sayutes	1,370	2,452	1.8
Tauchik	1,322	2,382	1.8
Kuryk	1,342	3,652	2.7
Zhatybai	2,010	3,646	1.8
Fort Schevchenko	1,136	2,288	2.0
Karazanvas	438	1,022	2.3
Aktau Port	638	2,242	3.5
Airport	1,014	2,146	2.1
To Atyrau	1,228	2,506	2.0
To Uzbekistan	786	1,604	2.0
To Turkmenistan	502	1,026	2.0
Total	28,316	57,756	2.0

Source: JICA study team
Traffic volume from Aktau Port and Airport is estimated by section.
Traffic volume from rail freight station in Uzen, Beineu and Shetpe is added.

(3) Trip distribution

The generating and attracting traffic volume in each zone is distributed by what is called the Fratar method which determine the future OD matrix by assuming the distribution pattern in the future is the same as the present pattern.

(4) Traffic demand on inter-region roads

The traffic demand on major roads is calculated by applying the traffic assignment model, which reflects the projected population and GRDP. The results are shown and compared with the existing traffic in Figure 7.A.2. As seen from the figure, the Aktau-Zhetybai section has the largest traffic exceeding 91,000 vehicles per day in 2015, followed by the section near Beineu with 87,000 vehicles and the Shetpe-Sayutes section with 80,000 vehicles.

(5) Future road design

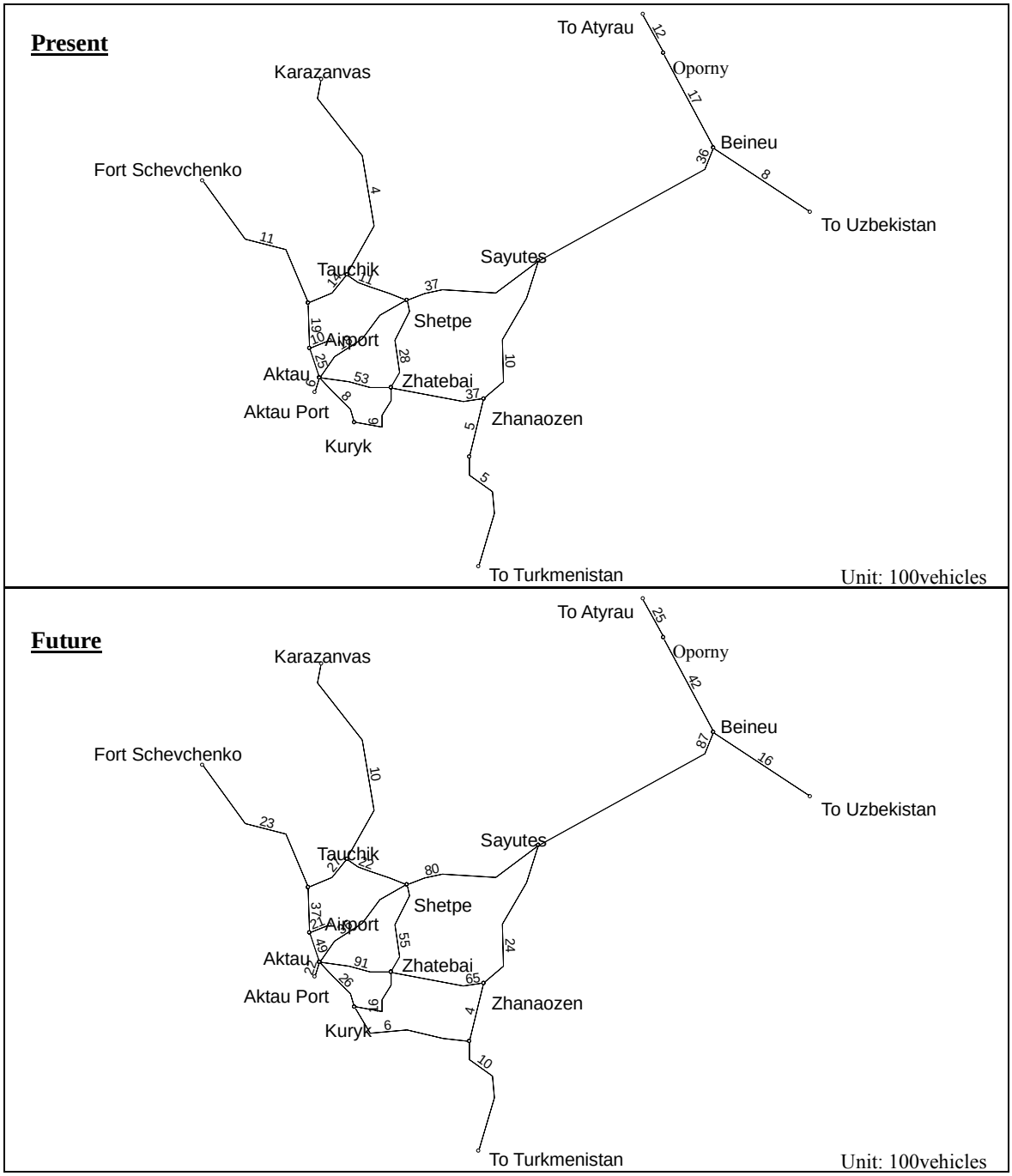
According to the road design standard of Kazakhstan, roads with more than 14,000 passenger car units per day are designed generally as four lane roads (Table 7.A.19). No road sections in Mangistau correspond to this class. The Aktau-Beineu and Aktau-Zhanaozen sections, however, may exceed the standard soon after 2015, and therefore should be considered for widening and improvement.

Table 7.A.19 Road Categories and Road Capacity

Category	Design volume		Applicable road
	pcu/day	vehicles/day	
Ia	>14,000	>9,000	More than 4 lanes & republican roads
Ib	>14,000	>7,000	More than 4 lanes & republican roads
II	6,000-14,000	3,000-7,000	Republican roads
III	2,000-6,000	1,000-3,000	Republican & local roads

Category	Design volume		Applicable road
	pcu/day	vehicles/day	
IV	200-2,000	100-1,000	Republican & local roads
V	<200	<100	Local roads

pcu: passenger car unit



Source: JICA Study Team

Figure 7.A.2
Estimated Traffic Demand of Inter-region Roads

7.3 Industrial Cluster Development Initiative

7.3.1 Logistics cluster support program

(1) Institutional framework for the logistic triangle

In order to realize the development of the logistics cluster, introduction of a special district system as an institutional framework is proposed to the logistic triangle area. The special district system here means the system providing preferential regulations and incentives to a specific area designated for the purpose.

In the special district, namely within the boundary of logistic triangle as well as Bautino Port, Kuryk Port, Tazhen (border point at Uzbekistan) and Temir Baba (border point at Turkmenistan), distribution and logistics activities will be enhanced through deregulation and incentives. Specific measures for the special district are described below.

Joint incentive package by Mangistau Oblast and the Central Government

A joint incentive package between Mangistau Oblast and the Central Government is to be introduced for logistic service providers that expand or newly develop facilities such as logistic center, truck terminal and warehouse in the logistic triangle area as well as Bautino Port, Kuryk Port and the border points. This gives preferences of exemption or reduction of corporate income tax, land tax and property tax, equivalent to those of SEZ. Introduction of a subsidy program by Mangistau Oblast to logistic service providers that employ a certain number of Oblast residents anew is an additional option.

The trend towards outsourcing of logistics services continues. The specialized service providers, so-called third-party logistics (3PL) service providers, offer firms many advantages, including reducing the need for capital investment, reducing working capital needs, and enabling penetration into new markets more quickly and with smaller capital. The range of services by 3PL is shown in Table 7.8. Consequently, the demand for stability, consistency, and flexibility has led to an increasing use of 3PL. In line with this trend, Mangistau Oblast must attract and develop word-class providers of customized logistics services in order to attract firms to set up their logistics bases in the logistic triangle area.

Table 7.8 Services Offered by 3PL Providers

Classical Services	Advanced Services	Full Services
Warehouse management	Pick and pack	Order processing
Transportation	Assembly/packaging	Order planning
Dispatch	Returns	System/IT
Delivery documentation	Labeling: price and bar code	Invoicing
Customs documentation	Stock account	Payment collection
		Logistics consulting
		Shipment tracking
		Materials planning

Source: OECD, Logistics Integration in the Asia-Pacific Region, 2000

In order to collaborate with the linkage industries cluster, manufactures that expand or develop logistic-related facilities in the logistic triangle area can be entitled to receive the joint incentive package.

Measures by Customs Office

The content of this section may not be for the authority of Mangistau Oblast, but for the Customs

Control Committee under the Ministry of Finance. However, implementation of these measures is important for the development of logistics cluster in the mid-term or long-term perspective.

(a) Simplified and fast-truck customs procedures

It was recognized that complicated and non-transparent customs procedures represented major non-physical barrier to trade and created problems in the relationship with the business community. These points are indicated in the sub-contracted Distribution and Logistic Industry Survey.

The customs office or the Customs Control Committee has already placed great importance on customs reforms and modernization to improve trade facilitation and transit in order to enhance the overall regional trading environment. In the Conference on Customs Reforms and Modernization held in April 2004 at Beijing, representatives from the Kazakh customs office presented and submitted a paper on customs reform and modernization initiatives and future plans of Kazakhstan. The paper stressed the simplified customs procedures as follows. These mechanisms should be promptly introduced on a pilot basis at the logistics triangle area.

One-Stop Clearance: This will enable freight transport community to complete all the necessary border-crossing procedures at one place in reduced time. One-stop clearance also saves public resources for border management.

Single Invoice: A unified security and payment form has been introduced that covers all potential payments in relation to both clearance and transit movements.

3-Stage Customs Clearance: The traditional customs clearance procedures inherited from the former Soviet Union involved a 5-stage clearance process. A new three-stage customs clearance and control mechanism has been introduced on a trial basis. Such a mechanism delineates the documentary and physical aspects of clearance, thereby shortening the duration of the whole process for same-day clearance.

(b) Promotion of private-public partnership

The development of a simplified customs transit system that ensures border security and timely delivery needs the full cooperation of the business community. Customs office should start a negotiation for agreements with trade associations. Also, it should be taken into account to outsource part of customs services to the private sector.

(c) Fully utilization of the output of World Bank Project for Customs Development

According to the World Bank News Release (No: 2007/08/KZ), the World Bank approved a US$18.5 million loan for the Kazakhstan Customs Development Project in November 2007. The project aims to reform and modernize customs administration in Kazakhstan: to increase revenue collection; improve transparency of customs operations and reduce potential for corruption; and promote use of internationally accepted practices to further integrate the Country into the world economy, and strengthen its investment climate and competitiveness.

The project with an overall value of US$62 million is co-financed by the Government of Kazakhstan in the amount of US$43.5 million, and has three main components. The project period is from 2008 to 2013. Thus, the output of this project can be fully utilized to activities of customs office in this logistic triangle area.

In addition to preferential treatments of regulation and incentives in the preceding sections, the following programs should be arranged or formulated by Mangistau Oblast in order to enhance the logistics triangle area.

Logistics Enhancement Program

Mangistau Oblast should formulate the Logistics Enhancement Program which may be drafted by a committee or the Logistics Development Board comprised of Aktau Port, Railway companies, SEZ, logistic center and related business companies/associations and representatives of the Central Government. The program aims to position the logistics triangle area at the forefront of logistics services in the Country by showing new logistics capabilities and enhancing competitiveness in conjunction with the "Land, Sea and Sky" concept and the future industrial and urban setting. Similar arrangements for development of the transport logistic center (TLC) are already seen among Mangistau Oblast, Aktau Port and other agencies concerned.

Training program

Every logistics area and port in the world is putting forth great efforts to train personnel. An effective education and training program for the staff of Mangistau Oblast and related entities/organizations including SEZ will be needed in order to produce logistics specialists that not only have strong language capabilities and the ability to work effectively with information technology, but also a solid foundation in all aspects of the supply chain, including warehouse management, inventory management, customer services, transport, purchasing, budgeting, accounting and forecasting. This training program may be a component of the above-mentioned Logistics Enhancement Program.

(2) National policy framework

The content of this section may be beyond the authority of Mangistau Oblast. It is, however, imperative for the development of the logistics cluster in the mid-term or long-term perspective.

Cross-border transport agreement

In terms of effective cross border trade, distribution and transport, it is proposed to formulate the agreement among the surrounding countries, while the agreement between Kazakhstan and the Kyrgyz Republic on transit of goods by road transport, which ensures the movement of goods to and from Kyrgyzstan without escort or a deposit by having a guarantee mechanism, was signed in March 2004.

As far as Mangistau Oblast is concerned, this agreement will be directly effective at the border areas with Uzbekistan and Turkmenistan.

The Cross-border transport agreement in the Greater Mekong Sub-region (GMS), signed in 2004, among Cambodia, China, Lao, Myanmar, Thailand and Vietnam is a good example. The GMS agreement is a compact and comprehensive multilateral instrument, which covers all the relevant aspects of cross-border transport facilitation.

These include:

(a) Single-stop/single-window customs inspection (i.e., joint inspection, mutual recognition of inspection, split arrangement: authorities from one country specialize in a particular function, while the authorities from the other country specialize in another function, e.g., according to traffic direction (outbound/inbound) or type of carriage (passenger/cargo) and so on),

(b) Ease of cross-border movement of persons (i.e., visas for persons engaged in transport operations),

(c) Exemptions from physical customs inspection, bond deposit and phyto-sanitary and veterinary inspection, and

(d) Unification of road and bridge design standards, road signs and signals.

As for joint inspection/control, which can drastically simplify and reduce processing time by avoiding the repetition of similar operations on both sides of the border, the Kyrgyz Republic and Kazakhstan have already entered into an agreement on joint control at the Kordai-Akzhol in July 2004 on a pilot basis. Kazakhstan has also developed a data exchange agreement with the People's Republic of China at the Korgas-Horgos border.

The cross-border transport agreement is an efficient and effective system for operation of regional transit. Concerned authorities and agencies including the private sector such as customs brokers, chambers of commerce and logistics and transport companies/associations should address this issue and share experiences in the region.

Effective implementation of trade agreement

Bilateral trade agreement (BTA) with neighboring countries and regional trade agreement (RTA) in order to eliminate tariffs and other trade barriers are the final form of institutional framework for development of trade and distribution.

Kazakhstan has already applied or signed bilateral trade agreements with Kyrgyzstan, Georgia, Moldova, Russian Federation, Tajikistan and Ukraine. As for regional trade agreement, on the other hand, Kazakhstan is involved in the Economic Union of the CIS in 1994, Eurasian Economic Commonwealth or Euro-Asian Economic Union (EurAses) in 2000, Shanghai Cooperation Organization (SCO) in 2001, and so on. Further, Kazakhstan signed a series of protocols to the international convention on the simplification and harmonization of customs procedures.

Several studies by international organizations, however, stressed that these agreements are not effectively implemented among CIS countries including Kazakhstan mainly due to the following reasons. Thus, concrete steps for solutions to these problems should be taken in the long-term perspective.

(a) Confusing web of commitments: simultaneous negotiations at bilateral, regional and multilateral level
(b) Little involvement of business sector
(c) Scarce human and financial resources for negotiation and implementation
(d) Lack of adequate level of domestic market reforms to support BTA/RTA
(e) Lack of economic complementarities among CIS countries
(f) Lack of political will to implement

(3) Rationale behind the proposed policy and institutional framework

Distribution and Logistic Industry Survey

The survey for senders/receivers of product such as manufacturers and wholesalers in Almaty, Astana and Aktau was conducted between October in 2007 and January in 2008 by a Kazakh consultant. As shown in Table 7.9, in Almaty and Astana, the answer with the highest share is “difficulties with distribution/transportation itself (including high costs)” expressed by 12 firms (33 %), followed by “complex customs procedures” by 11 firms (31%) and by “shortages of trade links with foreign partners” and “search of buyers” by seven firms (19 %) each. High transportation cost and complex customs procedures seem to be significant issues for senders/receivers of product.

Table 7.9 Issues or Problems in Business for Senders/Receivers in Almaty and Astana

Issues or problems	No.	%*
1. Difficulties with distribution/transportation (including high costs)	12	33.3
2. Lack of information on internal markets	6	16.7
3. Lack of information on external markets	2	5.6
4. Shortages of trade links with foreign partners	7	19.4
5. Complex customs procedures	11	30.6
6. Incompliance of product to international standards	3	8.3
7. Insufficient demand in the internal market of Kazakhstan	4	11.1
8. Insufficient demand in the regional market (Central Asia, CIS, please define)	1	2.8
9. Search of buyers	7	19.4
Total (multiple answers: total number of samples=36)	56	-

*Ratio of the number of answers to the number of samples (36)

In Aktau, on the other hand, the answer holding the highest share is "complex customs procedures" by seven firms (70 %), followed by "difficulties with distribution/transportation itself (including high costs)" by six firms (60 %), "search of buyers" by three firms (30 %) and "insufficient demand in the market of Mangistau Oblast" by two firms (20 %) as shown in Table 7.10.

Table 7.10 Issues or Problems in Business for Senders/Receivers in Aktau

Issues or problems	No.	%*
1. Difficulties with distribution/transportation (including high costs)	6	60.0
2. Lack of information on markets in Mangistau Oblast	0	0.0
3. Lack of information on external markets	0	0.0
4. Complex customs procedures	7	70.0
5. Insufficient demand in the market of Mangistau Oblast	2	20.0
6. Search of buyers	3	30.0
Total (multiple answers: total number of samples=10)	18	-

*Ratio of the number of answers to the number of samples (10)

World Bank survey

The Survey on "Creating Global Value Through Efficient Trade Logistics" by World Bank (2005) stressed significant trade barriers in Central Asian countries including Kazakhstan pertaining to trade policy include a complex tariff schedule and relatively high tariffs; escalation of tariffs; frequent and unpredictable changes in the tariff schedule; high implicit tariffs and so on. Moreover, the World Bank report "Connecting to Compete" in 2007 which measures the effectiveness of trade logistics in various countries showed that Kazakhstan is ranked 139th of 150 countries in the area of customs effectiveness. In an attempt to find a breakthrough to these situations, the World Bank started the Kazakhstan Customs Development Project in 2008, as shown in the previous section.

UNESCAP survey

The Study on Trade Facilitation in Selected Landlocked Countries in Asia (2007) by UNESCAP recommended the following measures for Kazakhstan.

(a) Trade and customs legislation review
The lead agency such as the Ministry of Industry and Trade should review trade and customs legislation and implement changes in keeping with developments in the external trade and global investment environment. Continued reforms are needed to overhaul the remnants of the old Soviet system and to ensure Kazakhstan's commitment to international conventions and standards.

(b) Simplification of trade documents
Steps can be taken to simplify and harmonize documents and procedures. This step will be

part of a long-term objective to introduce automation and ICT in an effort to expedite document processing and to introduce computerized transit or customs procedures.

(c) Customs declaration and clearance procedures
Taking steps to implement a system for self-assessment and self-declaration, which is commonly performed as part of trade regulation in most developed countries, can shorten the processing of customs declarations. To reduce non-tariff barriers and to speed up clearance times, one-stop shops for import and export clearance using the single window concept can be introduced.

(d) Improvement in quality of customs services and higher standards
The customs office has improved its transparency by placing rules, regulations and decrees related to customs on its website. Dissemination of this information through the website could reduce corruption.

(e) Trade security and risk management
Risk management techniques can be introduced to improve security at the borders. Training activities are also needed to assist agencies to manage risk through specific methods and interventions that facilitate trade on one hand and ensure compliance on the other.

(4) Infrastructure development

The development plan for the transport logistics center (TLC) presented below is based on the final report of another JICA study for the Project of the Integrated Logistics System and Marketing Action Plan for Container Transportation. Thus, this project is not included in the action plan of this master plan study.

Transport logistic centers (TLC) for containers

1) Background

One of the priorities of the Ministry of Transport and Communication is to provide assistance in order to formulate the national network of modern TLC's. Designated areas are Aktau, Astana, Almaty, Karaganda, Shymkent, Aktobe and the Dostyk railway station. The TLC in Almaty was already opened in September 2007. On realization of the project of TLC in Aktau, Mangistau Oblast has elaborated the concept "Land-Sea-Sky."

2) Description

(a) Location: SEZ near Aktau Port (Figure 7.9)

(b) Area size: 300ha (100ha in Phase 1)

(c) Multi modal transport: A multi-modal transport function will be provided, considering the location advantage of Aktau City

(d) Freight demand: The demand for TLC is estimated at 2.44 million ton in 2010 and 4.24 million ton in 2017, respectively, based on total of volume of three categories as shown in Table 7.11.

(e) Phased development: The development will be implemented by phase with 100ha in Phase 1, which comprises container management (60ha), railway and its management area (20ha), main building, warehouse and others (20ha).

Source: Study for the Project of the Integrated Logistics System and Marketing Action Plan for Container Transportation, JICA, December 2007

Figure 7.9 Location of Aktau Logistics Center

Table 7.11 Estimated Freight Demand for TLC

Unit: 10^6t

Category	2010	2017
Freight volume related to SEZ	1.72	2.88
Freight volume related to Aktau Port	0.5	1.14
Freight volume related to final consumption in Aktau City	0.22	0.22
Total	2.22-2.44	4.02-4.24

(f) Information and communication systems:

- External network connection by optic fiber cable or satellite communication network will be provided for all tenants.
- LAN between buildings is connected by cables and is constructed together with other utilities inside underground conduit.

(g) Cost estimation: The cost for Phase 1 development is estimated at KZT 12,894 million. The details are shown in Table 7.12.

Table 7.12 Estimation of Cost in Phase 1 for TLC

Unit: KZT 10^6 (2007 prices)

Item	Management Area	Cost
Facilities	Railway	420
	Container	6,179
	General/common facilities	894
	Infrastructure (road, etc.)	4,335
	Sub-total	11,828
Equipment	Rubber tired gantry	560
	Reach stackers	120
	Side loader	25
	Fork lifts	90
	Mobile crane	150
	Trucks and others	121
	Sub-total	1,066
Total cost		12,894

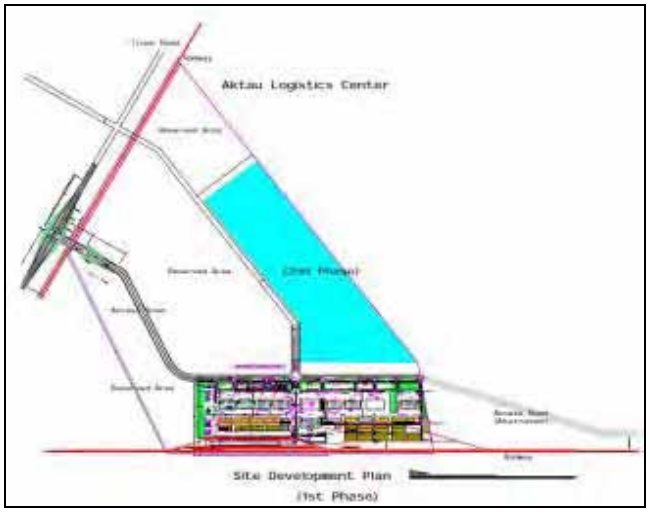
Source: JICA Study Team

(h) Environmental consideration: Judging from the characteristics of the planned TLC facilities, the elements that exert serious and negative influences on natural and social environment are not found.

(i) Economic and financial appraisal: This project is considered to be viable economically and financially. Economic internal rate of return (EIRR) is 29 %, while financial internal rate of return (FIRR) on total investment is 21 %. FIRR on equity varies from 25 to 55 %.

3) Key for implementation

Mangistau Oblast and authorities concerned go into action for implementation of the TLC. The company for management of TLC was already established. As of the end of October 2007, the company is looking for a well-experienced operator for TLC as a partner and has a plan to conduct a feasibility study. The layout is presented in Figure 7.10.



Source: Study for the Project of the Integrated Logistics System and Marketing Action Plan for Container Transportation, JICA, December 2007

Figure 7.10 Layout of Aktau Logistics Center

Regional border trade center/frontier trade center

This trade center is proposed mainly because the Distribution and Logistics Industry Survey indicated several firms have a plan for expansion of offices/plants in Aktau or Mangistau Oblast and a considerable number of manufactures and wholesalers face problems such as (a) lack of information on internal and external market, (b) shortage of trade link with foreign partners, and (c) search for buyers.

The center should be implemented as a public-private joint venture in order to promote efficient economic and trade activities in Mangistau Oblast, other oblasts and surrounding countries. The center will accommodate (a) rental sales offices for manufacturers, wholesalers, retailers, logistics related industry and others, (b) offices for trading information with ICT, (c) exhibition facilities for manufactured or processed products including local brand goods and (d) meeting and conference space for business transactions. The representative offices for trade and investment promotion in pan-Caspian countries and China should also be invited. This center may be established adjacent to the TLC in SEZ.

Regional truck terminals

The establishment of regional truck terminals with container depot is proposed in Zhanaozen,

Beineu and Shetpe in order to improve efficiency in distribution of commodities and to reduce the burden of transportation cost for manufactures and traders. These terminals may be developed by the private sector, but the support from Mangistau Oblast and railway companies is preferable. A private-public joint venture is one approach for the development.

Regional truck terminals need to be installed or equipped with facilities such as berths for loading and unloading cargo, handling space or platform for sorting cargo, container depot and reserved space for temporary storage as well as an administrative office and a common office for transportation companies.

Title	**Regional border trade center**
1. Location	SEZ area adjacent to Transport Logistics Center (TLC)
2. Implementing Agency	Private companies and Mangistau Oblast
3. Objectives	1) To strengthen traders and logistics industries in Mangistau Oblast 2) To promote trade in Mangistau Oblast with the surrounding countries/regions in cooperation with TLC and SEZ
4. Expected Effects	1) Attainment of the position of a logistic hub in the surrounding countries/regions 2) Improved efficiency in economic activities in Mangistau Oblast
5. Phasing	Phase 2
6. Investment Costs	KZT 960 million (Total floor area of 20,000m^2)
7. Descriptions	

The Government designates Mangistau Oblast as the western gateway of Kazakhstan due to its strategic location and existing infrastructure, particularly the Aktau port as the only international port of the Country that can be utilized all the year round. Both the main north-south and the east-west corridors/routes pass through the Oblast domestically and regionally.

The sub-contracted Distribution and Logistic Industry Survey indicated 6 firms (17 percent of respondents), manufactures and wholesalers in particular, have a plan for expansion of offices/plants in Aktau or Mangistau Oblast from the view point of distribution of their products and commodities. On the other hand, a considerable number of manufactures and wholesalers face problems such as (a) lack of information on internal and external market, (b) shortage of trade link with foreign partners and (c) search for buyers.

In response to current situations discussed above, the Regional Border Trade Center is proposed. This trade center should be implemented as a public-private joint venture in order to promote efficient economic activities in Mangistau Oblast, other oblasts and surrounding countries through trade and distribution. The center will accommodate (a) rental sales offices for manufacturers, wholesalers, retailers, distributors and others, (b) offices for trading information with ICT, (c) exhibition facilities for manufactured or processed products including local brand goods and (d) meeting and conference space for business transactions. The representative offices for trade and investment promotion in Caspian Sea Rim countries and China should also be invited. This center may be established adjacent to TLC in SEZ.

Invitation of various traders and buyers from other oblasts and surrounding countries is a key for implementation in accordance with development of TLC and deregulation of trade policy. The operator of this center may be a private sector, but some space that does not produce income may be maintained by public sector.

In Urumqi, the capital city of Xinjiang Uyghur Autonomous Region, there are large scale wholesale markets and trade centers, which handle furniture, building material, electronic appliance and articles for daily use. The total floor area in these markets amounted to 600,000m^2. The markets attract many buyers and traders from Central Asian Countries. The proposed Regional Border Trade Center will have the similar function, although the scale is small.

Title	**Regional freight truck terminal project**
1. Location	Uzen station, Beineu station, Shetpe station
2. Implementing Agency	Transport department, Mangistau oblast, KTZ
3. Objectives	To support the transshipment to truck and handling containerized cargo expected to increase at the regional railway freight station in future.
4. Expected Effects	1) Increase of mixed modal transportation, long-distance railway and short-distance truck 2) Supply of high-level service about physical distribution such as door-to-door style, small lot transport and just in system.
5. Phasing	Phase 2
6. Investment Costs	US$37.6 million
7. Descriptions	

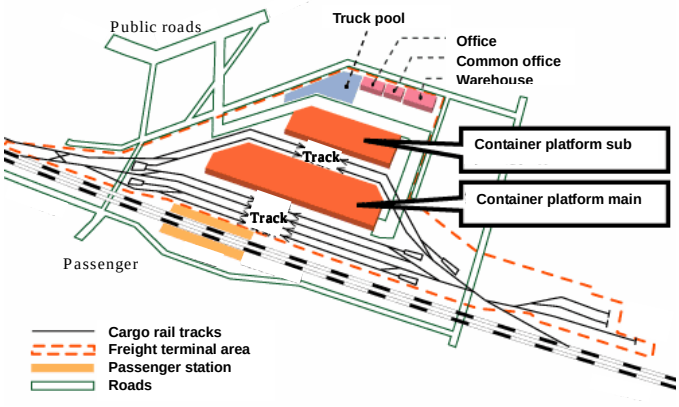
(1) Outline
The freight terminal of three rural areas except around Aktau, Magishlak station which has already handled containers will be planned with introduction of container handling and transshipment to truck.

(2) Handling container volume in future

Railway station	Hinterland	Freight volume / Truck volume in 2015		
		Container (TEU/year)	Except container (t/year)	Truck (vehicles/day)
Uzen station	Zhanaozen city Karakiyan oblast	5,530	405,000	77
Beineu station	Beineu oblast	2,000	146,000	28
Shetpe station	Mangistau oblast Tupukaragan oblast	2,270	168,000	32

(3) Required area space and function
Required facilities are as follows and its total scale is about 50,000m^2 about each terminal.
a) Track and sidetrack
b) Container platform
c) Truck pool
d) Truck way
e) Cargo warehouse
f) Administrator office, Common office for transportation company
g) Maintenance garage

(4) Landscape image



7.3.2 Linkage industries support program

(1) Promotion of the Morport Aktau SEZ

Comparative analysis on SEZ's

SEZ's may be classified into several types based on their characteristics. Three broad types are: one that centers on trade utilizing a free port, another such as export processing zone (EPZ) for products manufacturing, and the third that provides services (e.g., IT, finance, commerce, etc.). The SEZ with a free port may be represented by those in Hong Kong and Singapore. The SEZ centering on manufacturing may be represented by those in Malaysia and Indonesia. As a SEZ of IT, Bangalore in India is a typical example. The SEZ of finance is represented by those in Bahrain and Dubai. As a SEZ of the commerce centering on a cargo distribution, the Jubel Ali of Dubai, and Mauritius may be representatives. These SEZ's are compared in Table 7.13.

Table 7.13 Comparison of Special Economic Zones of Different Types

		Trade		Manufacturing		Services	
Aspect	Free port	Special economic zone	Industrial free zone / EPZ	Enterprise zone	Information processing zone	Financial services zone	Commercial free zone
Physical characteristics	entire city or jurisdiction	entire province region or municipality	enclave or industrial park	part of city or entire city	part of city or "zone within zone"	entire city or "zone within zone"	warehouse area, often adjacent to port or airport
Economic objectives	development of trading center and diversified economic base	deregulation; private sector investment in restricted area	development of export industry	development of SME's in depressed areas	development of information processing center	development of off-shore banking, insurance, securities hub	facilitation of trade and imports
Duty free goods allowed	all goods for use in trade, industry, consumption	selective basis	capital equipment and production inputs	no	capital equipment	varies	all goods for storage and re-export of import
Typical activities	trade, service, industry, banking, etc.	all types of industry and services	light industry and manufacturing	all	data processing, software development, computer graphics	financial services	warehousing, packaging, distribution, trans-shipment
Incentives - taxation - customs' duties - labor laws - other	simple business start-up; minimal tax and regulatory restraints. Waivers with regard to termination of employment and overtime. Free repatriation of capital, profits and dividends preferential interest rates	reduced business taxes; liberalized labor codes; reduced foreign exchange controls. no specific advantages; trade unions are discouraged within SEZ	profits tax abatement and regulatory relief; exemption from foreign exchange controls. free repatriation of profits. Trade union freedom restricted despite the fact that EPZ's are required to respect national employment regulations.15 years exemptions on all taxes (max.)	zoning relief; simplified business registration; local tax abatement; reduction of licensing requirements. Trade unions are prohibited. Government mandated liberal on hiring and firing of workers	de-monopolization and deregulation of telecomm; access to market-priced INTELSAT services. a specific authority manages labor relations. Trade union freedom restricted	tax relief; strict confidentiality; deregulation of currency exchange and capital movements. free repatriation of profits	exemption from import quotas. reinvested profits wholly tax-free
Domestic sales	unrestricted within freeport outside freeport, upon payment of full duty	highly restricted	limited to small portion of production			limited to small portion of production	unlimited, upon payment of full duty
Other features	additional incentives and streamlined procedures	developed by socialist countries	may be extended to single- factory sites				

		Trade		Manufacturing		Services	
Aspect	Free port	Special economic zone	Industrial free zone / EPZ	Enterprise zone	Information processing zone	Financial services zone	Commercial free zone
Typical examples	Hong-Kong (China), Singapore, Bahamas freeport, Batam, Labuan, Macao	China (southern provinces, including Hainan and Shenzhen)	Ireland, Taiwan (China), Malaysia,Dominican Republic, Mauritius,Kenya, Hungary	Indonesia, Senegal	India-Bangalore, Caribbean	Bahrein, Dubai, Caribbean, Turkey, Cayman	Jebel ali, Colon, Miami (USA FTZ) Mauritius, Iran

Source: FTZA

Factors for successful SEZ's

The prime factors determining the success of SEZ's differ from one SEZ to another and from country to country. One regulatory reform has supported the success of SEZ's in China. Bangladesh was successful in operating a traditional EPZ as a manufacturing base to generate 140,000 employment opportunities. The Philippines have developed large scale SEZ's under the SEZ authority. Mauritius utilized a preferential market access of the island country to promote its EPZ. A newest SEZ in Korea is using a physical distribution hub function as the core function. SEZ's in Malaysia and Dubai are also considered successful cases, where the former changed functions of the SEZ as the industrial structure has advanced.

The success factors reflect international market situations, domestic market conditions and various initiatives by respective governments. Political stability is the fundamental factor and a prerequisite for the successful SEZ development. Other more specific factors include the location, existing infrastructure, the level and the size of host country market, the availability and the quality of labor force. While the success of SEZ's is supported by the strong government leadership made visible by the related institutions, the SEZ operation may be hampered by bureaucratic procedure, corruption and other less visible factors.

Measures for the Morport Aktau SEZ promotion

The promotion of the Morport Aktau SEZ faces difficulties due to the lack of effective marketing strategy. The Department of Morport Aktau SEZ, established by the Presidential decree as the management entity, needs to be empowered to attract foreign direct investments in cooperation with KAZINVEST, the official agency of Kazakhstan for investment promotion. In developing effective marketing strategy, it is important to clarify the satisfaction of basic requirements by prospective investors and emphasize advantages for them.

The basic requirements include clear administrative procedure for registration and business operation at the SEZ, availability of human resources in sufficient quantity and quality, and incentive measures comparable to SEZ's or similar facilities elsewhere. The third condition is considered largely satisfied by the Aktau SEZ, but the other conditions need to be improved. Given the limited human resources available locally and the lead time required for training qualified workers, the restriction on the employment of foreign workers dictated by the Law on Employment and Rules of Hiring Foreign Labor Force should be relaxed for the SEZ with a time limit. The foreign workers should be utilized for on-the –job training of Kazakh workers. At the same time to encourage the employment of Kazakh workers, subsidies should be introduced for training, employment of Kazakh workers and R&D program by companies located in the SEZ.

To improve the administrative efficiency of the SEZ, a one-stop consulting center may be established within the SEZ as a window of relevant ministries. It should be linked on-line with related Central Government agencies in Astana, and also foreign agencies. An automatic system should be introduced for on-line application and approval of investments with a standard format.

Possible advantages of the Aktau SEZ that may be established include the following:1)preferential market access to the Caspian Sea rim and other neighboring countries, 2) logistic center as the core

function, and 3) abundant utilities at low costs.

The satisfaction of basic conditions and the advantages of the Aktau SEZ should be known widely to potential investors. For this purpose, the website of the SEZ should be much improved. It should provide information on FDI laws including corporate law, tax law and labor law, related legislative amendments, decrees and declarations, achievements of foreign investments and their evaluation by investors, and others.

(2) SME's industrial estate development

SME upgrading system

The SME upgrading system is recommended based on the recognition that the innovation of the SME's in Mangistau cannot be expected on the individual enterprise bases due to their limited capacities with respect to credibility, financial security and technical capability. A breakthrough should be obtained by grouping of SME's.

The SME support measures such as consultancy, training, financing and business supports currently provided separately by different agencies should be integrated and provided to SME groups or cooperatives for effectiveness. This can be naturally realized for the SME's located in the SME's industrial estate. In this way, purpose-oriented SME promotion linking innovation and business development can be expected.

The SME upgrading system consists of sub-systems of project finance, group finance, and group consultancy linked with finance, which combined would work as a unified innovative system for SME's. These sub-systems and system effects are described.

Project finance and group finance

A conventional financing is on mortgage to minimize risk on the part of financier. Project financing is proposed as a method for risk hedge through risk sharing by a group of SME's and risk taking by either Atameken or Akimat. This provides the only breakthrough to the traditional financing. Also, loans may be provided collectively to the group rather than individually to overcome the typical problem of "too many and too small" loans for large administrative cost to the financier. This financing mechanism would reduce the risk as well as administration cost on the part of financier due to joint and collective liability by the SME group, and ensure more effective capital investment and risk minimization on the part of borrowers.

Project financing provides a loan secured on properties of the project financed by the loan, which should be refunded from the cash flow of the project operation expected in the future. In this way, the financier naturally share the risk associated with the project with the borrower. This mechanism would be strengthened if the Akimat shoulders part of the risk through formal arrangements.

SME groups with legal status

For this mechanism to work, the financier's confidence and trust on the management capacity of the borrower and the project must be built up. As a prerequisite for collective financing and supports to SME groups, the legal status of SME groups should be clarified. It is desirable that SME groups should be established as legal entities, which should follow established guidelines for commercial business operation with good management capacity including compliance with auditing and accounting standards.

Official consultancy and guidance

Any financing is subject to some assessment and screening of potential borrowers such as financial status and value of mortgages. In case of project financing, it is important to ensure that large-scale investments for innovation of production processes are viable technologically as well as financially. Therefore, official consultancy and guidance become essential conditions for the project finance. Such consultancy and guidance for SME's need to be provided for analyzing existing conditions the SME's, formulating an implementation plan for production innovation and management, evaluating marketability and business development plan, and others. In particular, a mechanism for collective consultancy and guidance to SME groups should be established.

Technology transfer

A SME group is expected to work as a technical center for development, exchange and transfer of technology. The Akimat is expected to support these processes by the private sector financially.

Facilitation of grouping

In practice, the grouping of SME's would be the most difficult task involved in the SME upgrading system. Various devices may be applied to facilitate the SME grouping. Public relations and information dissemination need to be undertaken on the potential advantages of grouping. The long-term low cost large fund that may be made available would be the strongest incentive for SME's to group.

Promotion activities by Atameken would be instrumental for owners and managers to participate in the SME grouping to improve their management and production. Specifically, the Akimat should formulate and advertise a regional or industrial promotion plan, along which SME owners are invited to implement the schemes constituting the SME upgrading system. It is advisable that the existing SME services activities by the Akimat are effectively utilized such as technical service center and SME financial services.

(3) Business incubation development

Business incubation comprises hardware such as office spaces and facilities for new business, and software in the form of an incubation manager. In Aktau, there exist many unused facilities that can be used for the former, and therefore the latter should be prioritized. Business incubation consists of the following functions.

1) Management assistance: support for training, networking with external actors, marketing, accounting, legal aspects etc.
2) Financial assistance: support for financial analysis on new business, fund sourcing, proposal writing for funding, business planning, and joint-venture making
3) Technical assistance: consultancy, group research promotion, cooperative arrangements with research institutes, support for access to research outcomes etc.
4) Infrastructure assistance: office spaces and equipment, common facilities, laboratory, library and other support facilities

For these different functions, division of works needs to be clarified between the private sector, academics and the government. The key issue in business startup, development and stable operation is financing, and the utilization of existing sources such as investment fund, national innovation fund and SME development fund or other schemes needs to be examined in detail.

The public initiative is indispensable for training incubation managers. Training programs should

be developed by the Aktau State University, training institutes and the Oblast Akimat, and a budget should be obtained. Regional cooperation should be called of business entities in Mangistau, researchers at the university and vocational training institutes, and potential investors. A technical evaluation committee should be formed to examine business seeds and ideas. The program to implement the business incubation development is summarized in Table 7.14

Another way to train incubation managers is to utilize the existing aid schemes of donors. For instance, the Kazakhstan-Japan Center for Human Development in Almaty and Astana offers various business training courses. Even courses may be tailor-made to suit the needs identified for Mangistau Oblast, to which appropriate experts will be dispatched.

Table 7.14 Business Incubation Implementation Program

Target/Subject	Short term: 2008-2010	Medium term: 2011-2015	Long term: 2016-2030
Development target	Drafting of incubation program plan	Development of incubation managers and incubators	Development of supporting network and program follow up
Incubation program	• Establishment of implementation committee for study of entrepreneurship program implementation manners • Study for collaboration manner of entrepreneurship program between Akimat and University, Academy, etc. in Mangistau Oblast • Preparation (i.e., organization reform, budget allocation for employment of incubation managers, PR materials) of "enterprise development and supporting unit"	• Establishment of "technical evaluation committee" for study of seeds and idea on entrepreneurships and idea • Implementation of entrepreneurship education curriculum in under/postgraduate programs for students and local residents • Implementation (i.e., finding and collection of seeds and idea on entrepreneurships) of "enterprise development and supporting unit"	• Evaluation for entrepreneur program and incubation manager development program by technical evaluation committee • Extension of program from Aktau to rayons • Consultation of business plan, exchange information by grouping among enterprises, entrepreneurships, job-change, job hunting, etc.
Incubation managers	• Study of incubation manager development scheme • Public advertisement and selection of incubation managers	• Implementation of in-service training for incubation managers • Expansion of number of incubation managers	• Extension of program from Aktau to rayons • Establishment of incubator manager development scheme
Incubators	Study of incubators' conditions (place, office size, number of office, rental charge, other conditions, etc.)	Establishment of incubators	Extension of program from Aktau to rayons
Financial support	Study of new financial support scheme including existing ones	Financial support implementation for entrepreneurs	Review and upgrade of scheme

Source: JICA Study Team

(4) Information and consulting services

The manufacturing sub-sector in Mangistau is dominated by SME's providing products and services for local consumption. SME's should be targeted for supports in industrial development and economic diversification of Mangistau as they are potentially significant employment

generators. At present, the access by SME's to business information is very limited, while the Oblast Akimat is making efforts to collect relevant information.

An "enterprise development and support unit" may be established within the Private Business Industry Department of the Akimat as a one-stop consulting center especially for SME's. The unit would provide information services covering incentive measures available, data on existing enterprises, marketing opportunities and prices, and services available at different sections of the Akimat. It should also provide consulting services related to business planning, accounting and financial management, procurement, marketing, and business partnership arrangement. The unit may be staffed by experienced private business.

The unit should become a center for close collaboration between enterprises, research institutes and the Oblast Akimat for Mangistau brand development (Figure 7.11). They would collaborate, for instance, for tourism campaign linked with international agents, inter-business exchange seminar, and business-academics coordination. The unit would be instrumental for networking SME Development Fund, Caspy, Oblast Chamber of Commerce and Industry, Atameken and other related organizations.

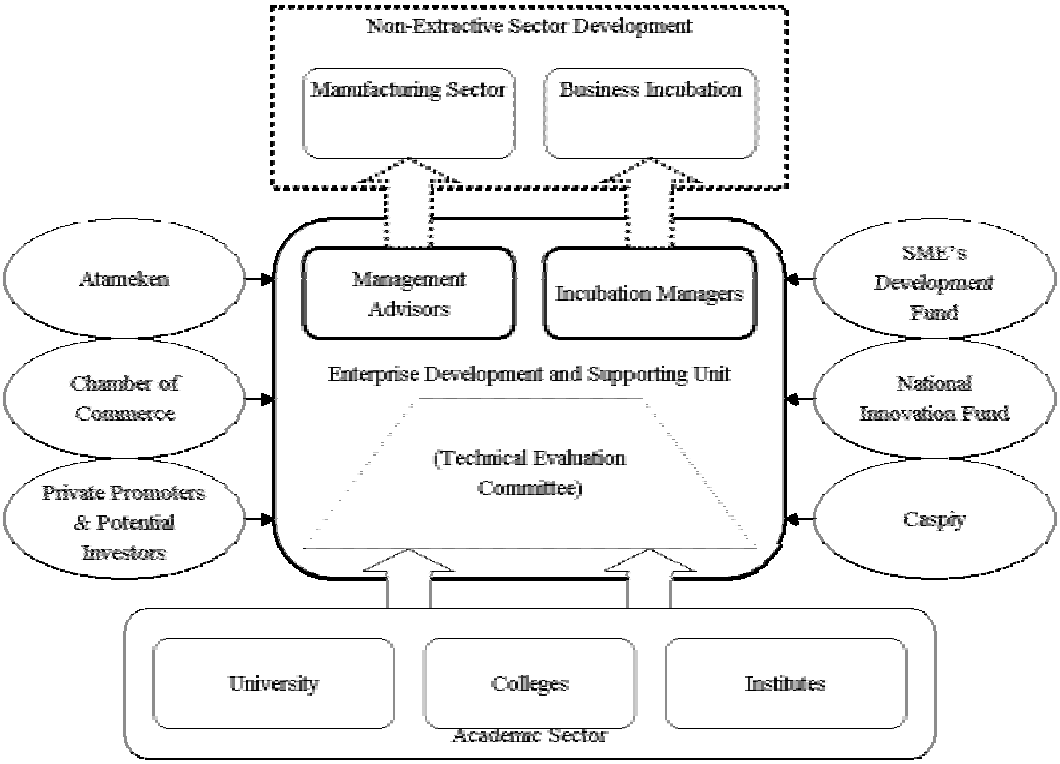


Figure 7.11 Image of Non-extract Sector Development Collaboration Unit

For business training, the Kazakhstan-Japan Center for Human Development may be effectively utilized. Several courses are available for entrepreneurship development and SME management.

Business financing is another area where the Oblast Akimat can support SME's possibly through the enterprise development and support unit. At present, the Akimat does not involve in the practice of financial schemes of the State Government, and most local enterprises do not even know the existence of the schemes. An indirect financing scheme should be considered, whereby the Akimat and Kazyna can cooperate. Through the close collaboration with local enterprises for the information services, the Oblast Akimat would be in a good position to guarantee the credibility of some local enterprises with respect to management. Such finance-management linkages would

lead to the establishment of regional champions for best business practices in different fields.

Title	**Business incubation development program**
1. Location	Aktau and rayons
2. Implementing Agency	Oblast Akimat and University
3. Objectives	1) To promote employment expansion 2) To contribute to the development of regional economy
4. Expected Effects	1) Development of personnel potentials in Oblast 2) Diversification of manufacturing goods with value added 3) Creation of community vitalization and harmonization
5. Phasing	Phase 1-3
6. Investment Costs	KZT 4 million per annum
7. Descriptions	

It is of necessity to create new industries that could generate employment opportunities in order to promote manufacturing in Mangistau Oblast. There will be two keys to successful business incubation. One is the creation of incubation facilities (incubators); the other is nomination of incubation manager in charge of giving support to opening and developing business.

The fundamental functions of business incubation consist of i) management assistance, ii) financial assistance, iii) technical assistance, and iv) infrastructural assistance. A basic framework for business incubation shall be studied and monitored by the Technical Evaluation Committees consisting of representatives from the private sector, university, Kazyna, Caspiy, Akimat and other related organizations.

A business incubation assistance program will be required to take the following actions.

1) Creation of entrepreneurs to open business: The role of Akimat is to support individuals and groups with an intention to open project/business. For this purpose, the "EDSU (Enterprise Development and Supporting Unit)" will promote the opening of business.
2) Creation of business seeds and business ideas: The tie-up between industry and university will be strengthened to form a base to discover business seeds and ideas and facilitate research development. Business incubation seminars will be conducted with the involvement of academic staff from universities and institutes, aiming at promoting business seeds and ideas among students and residents.
3) Creation of incubation managers: An incubation manager has an indispensable role in managing incubators, developing and implementing assistance programs. It is of urgent necessity to propose and implement a training program for incubation managers in Mangistau Oblast.
4) Expansion of incubators: Offices must be supplied to entrepreneurs in the industrial estate for SME's being developed by "Atameken" or existing factories/shops not operating in Aktau.
5) Building a cooperative network: A cooperative network amongst public, private, and academic sectors will be constructed. The Akimat will take responsibility for total coordination among the network
6) Budget preparation: Incubation managers shall make a budget aid program, by promoting activities such as discovery of available funding (Kazyna) in Mangistau Oblast and other areas
7) Post-graduation support and follow-up for businesses: Collaboration system will be built between those graduated and up-comers.

Title	**Enterprise development and support unit establishment**
1. Location	Aktau, Zhanaozen, Boyneu, etc.
2. Implementing Agency	Akimat
3. Objectives	1) To facilitate business information exchange 2) To strengthen public, private and academic sectors for promotion of non-extractive sector development

4. Expected Effects	1) Empowered manufacturing sector development and planning 2) Expansion of employment opportunities
5. Phasing	Phase 1-3
6. Investment Costs	KZT 40 million per annum
7. Descriptions	

More effective dissemination of business information will require re-examination from viewpoint of customers (SME's as end-users). Collection and dissemination of enterprise basic data should be conducted by Akimat. Such data will be open to public regularly, allowing up-coming business people to have opportunities for business transactions between enterprises and empowerment in competitive environment.

The "EDSU (Enterprise Development and Supporting Unit)" as "one-stop-consulting-center" will be established and provide business people with necessary information for enterprises. Data collection from each enterprise will be operated through direct visit and hearing by staff. The Akimat should promote support of businesses that are willing to make effort in productivity improvement, expansion of new market, management renovation, development of new products, etc. As providers of such services, professional business experts called "Enterprise Management Advisors" will be hired and stationed in the EDSU to coordinate technical needs and seeds, assess market potentiality, etc.; find issues in financial and management aspects and; coordinate assistance strategy for enterprises in need.

In facilitating cooperation between public, private and academic sectors, it is important to coordinate and meet their needs. As a measure, "inter-business exchange seminars" will be organized to bridge managing people from various working fields. Another measure is to build a mechanism to put advertisement in magazines and/or e-mail magazines issued by related agencies.

As for financial support by existing fund, it has a role that the private sector cannot easily play, e.g. private venture fund. Therefore, it should be considered to create an easy mechanism to get loans. First, current "SME Development Fund" has disadvantage for borrowers in getting loans due to high interest rate. Therefore, the Akimat shall share a part of interest to reduce burden for enterprises. Second, the current financial schemes require mortgages that are difficult for the borrowers to pay. Therefore, the Akimat should support to be their mortgage. The enterprise management advisor will provide, according to necessity, advice and assistance on promotion of financial scheme, necessary procedures, and application manner, etc.

It is necessary to generate climate in which many SME's in Mangistau Oblast are motivated for management improvement. To lead "one-stop- consulting-service" to better functioned, human resources with rich experience in private sector should be involved to establish the EDSU. The EDSU will be based first in Aktau, and then expanded to cover rural areas (rayons).

7.3.3 Derivative industries support program

(1) Supply of natural gas for gas chemistry

Production and expansion plan of natural gas

Kazakhstan intends to expand the natural gas production from 29.6 billion m^3 in 2007 to 114 billion m^3 by 2020, according to the president of KazMunayGas. This will increase the share of Kazakhstan in the world production of natural gas significantly from 0.8% in 2006. Of the increased production, 80% will be exported after the removal of sulfur content and refining, and 16% or 18.7 billion m^3 devoted to domestic consumption but not in Mangistau.

The proven natural gas reserve in Mangistau, 11.5 billion m^3, accounts only for 0.4% of the total proven reserve of 3.0 trillion m^3 in Kazakhstan. Additional reserves are expected, although not

confirmed yet. The present consumption of natural gas in Mangistau is much smaller than the amount necessary for establishing natural gas chemistry. After the expansion of the natural gas production by 2020 as mentioned above, there will be sufficient supply for gas chemistry. Besides, some gas used for power generation at oil fields may be replaced by nuclear power to make additional gas available for industrial use.

Consumption of natural gas

The natural gas consumption for industrial, housing and other uses is planned to expand to 3.12 billion m^3 in 2020 and 3.71 billion m^3 in 2030, of which 64% is for heat and energy producing enterprises (Table 7.15). Of the total consumption in 2020, 2.50 billion m^3 or 80% will be produced by Tolkynneftegaz Co., Ltd., and 95% of the production is expected for sale as tank gas. The volume of flare gas is small since the gas contains low sulfur and used more readily as fuel.

Table 7.15 Projection of Gas Consumption in Mangistau Oblast, 2007-2030

Year	Population	Municipal enterprises	Industrial enterprises	Heat and energy producing enterprises	Total
2007	132.276	14.332	285.719	1687.572	2119.899
2008	140.875	19.652	304.326	1699.110	2163.963
2009	143.211	19.953	611.272	1734.106	2508.542
2010	150.486	20.102	857.130	1756.905	2784.623
2015	154.081	29.769	860.774	1838.978	2883.602
2020	166.623	32.192	931.213	1989.900	3119.928
2025	180.916	34.953	1011.1	2162.150	3389.119
2030	198.426	38.337	1109.017	2367.782	3713.562

(2) Proposed methanol derivative industries for Mangistau

Demand-supply for methanol derivatives

Major methanol producing regions in the world are Asia, Middle East, and South America, where the total production increased at over 10% per annum during 2003-06 (Table 7.16). The major methanol producing countries are all natural gas producers. The world demand for methanol increased at the average annual rate of 4.2% during 2003-06, although the demand in North America and Europe declined (Table 7.17).

The demand for methanol concentrates in a few derivative products with 60% for formaldehyde, acetic acid and MTBE (Table 7.18). Formaldehyde is a basic raw material for many kinds of chemicals such as paints, polyacetal plastics, a component of urethane-elastomer MDI and others. Acetic acid is used also as a basic material for chemical products such as adhesives, modifiers of PVC and polyethylene. MTBE is used as a gasoline additive to enhance the octane value, but its use was reduced significantly in the USA due to change in regulation.

Table 7.16 Supply of Methanol in Major Areas in the World

(Unit: 10^6t)

Supply in Area	2003	2004	2005	2006	'06 share (%)	Av. growth ('03 to '06)
Asia	5.8	7.3	7.6	9	24	15.8
Middle East	6.1	7.1	7.8	8.7	24	12.6
North America	4.9	4.4	2.6	1.5	4	-32.6
South America	7.5	8	9.8	11.5	31	15.3
Europe	3.4	3.3	3.4	3.0	8	-4.1
Others	5.0	3.9	3.9	3.3	9	-12.9
Total	32.7	34.0	35.1	37.0	100	4.2

Table 7.17 Demand for Methanol in Major Areas in the World

(Unit: 10^6t)

Demand in Area	2003	2004	2005	2006	'06 share (%)	Av. growth ('03 to '06)
Asia	10.9	12.7	13.9	15.1	40.8	11.5
North America	9.5	8.9	8.8	8.1	21.9	-5.2
Europe	6.8	6.7	6.6	6.6	17.8	-4.1
Others	5.5	5.7	5.8	7.2	19.5	9.4
Total	32.7	34.0	35.1	37.0	100.0	4.2

Table 7.18 Demand for Methanol Products

(Unit: 10^6t)

Demand for uses	2003	2004	2005	2006	'06 share (%)	Growth/yr ('03 to '06)
Holmaldehide	10.7	11.5	12	12.2	33.0	4.5
Acetic Acid	3.1	3.3	3.4	3.8	10.3	7.0
MTBE	7.4	6.7	6.4	6	16.2	-6.8
MMA	1	1.1	1.2	1.2	3.2	6.3
Others	10.5	11.4	12.1	13.8	37.3	9.5
Total	32.7	34.0	35.1	37.0	100.0	4.2

The application of MMA is increasing to attain 6.3% per annum during 2003-06. While the demand is still small, its properties as a plastic glass with surface brightness, hardness against scratching, and transparency are valuable for automobile industry, LCD panel for digital machine display and other uses. The basic material of MMA is acrylic acid, which is also a starting material for AA polymer having a large market of high water absorbent polymer such as disposable diapers for babies.

Model methanol derivative industries

The gas chemistry operation in Mangistau should be established for methanol derivatives of high value-added. A model may be derived from a Japanese firm operating worldwide a chain of methanol related business with the annual turnover of US$2.4 billion based on methanol plants in major natural gas producing countries such as Saudi Arabia, Indonesia and Venezuela (Figure 7.12). The chain encompasses not only production but also transport, storage, marketing and logistics, and R&D.

A case for Mangistau is worked out here for the production of methanol, formalin and MMA. The production, use of input, and investment cost are summarized in Table 7.19. The annual production consists of 415,000t methanol, 20,000t formalin and 50,000t MMA. The production of polyacetal is also included. The properties and applications of methanol derivative products are summarized in Table 7.20.

The details of methanol production are given in Table 7.21, based on the data obtained from an engineering company in Japan. The investment cost varies depending on the process, location and other specifics of a company. The natural gas is steam reformed at the temperature around 871°C and under the pressure 18-22 atm to obtain synthetic gas feed. Methane is synthesized over a proprietary ICI copper-based catalyst at 249-282°C and 70-110 atm. Methane is condensed from reaction gasses, and the un-reacted gases are recycled after taking out a purge stream, used as the fuel in the reformer furnace.

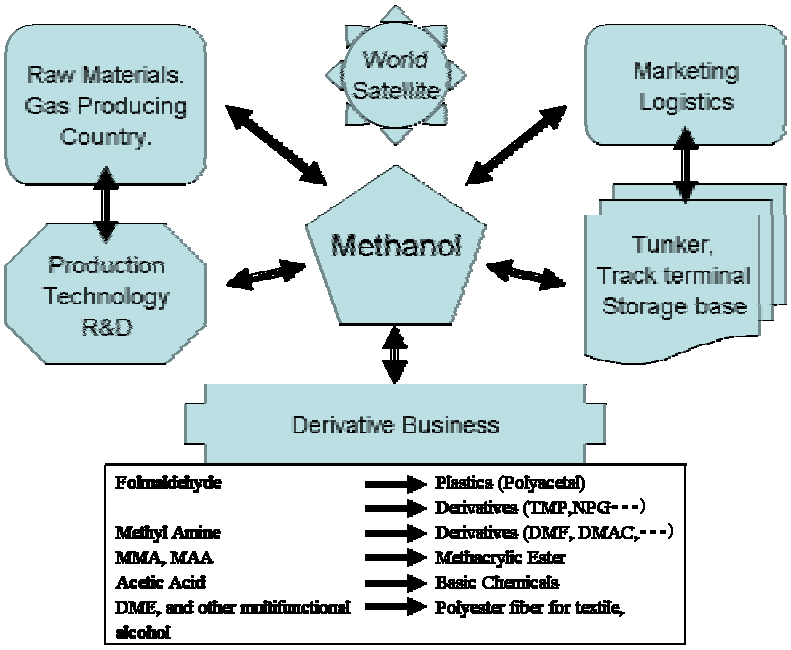


Figure 7.12 A Model for Methanol Chain Business

Table 7.19 Model Production of Methanol, Formalin and MMA in Mangistau

Methanol	Production	415,000t/year	Formalin	Production	20,000t/year
	Investment	US$230 mil.		Investment	US$30 mil.
	Annual consumption of natural gas	380 mil. m^3		Consumption of methanol	85,000t
	Other input			Other input	
	Plant coolant	136,000t/day		Plant coolant	24t/day
	Process water (clean water)	1500t/day		Steam	303t/day
	Power generation	4,150kWh		Power generation	30kWh
MMA	Production	50,000t/year	Polyacetal	Production	100,000t/year
	Investment	US$90 mil.		Investment	US$62 mil.
	Consumption of methanol	17,000t		Consumption of methanol	134,000t/year
	Auxiliary material: Isobutylene	370,500t		Auxiliary material: E Oxide	5.500t/year
	Others input			Others input	
	Plant coolant	54,100t/day		Plant coolant	162,000t/day
	Steam	530t/day		Steam	2,636t/day
	Power generation	25,200kWh		Power generation	160,000kWh

Table 7.20 Properties and Applications of Methanol Derived Products

Products	Properties and applications
Formaldehyde	Largest application of methanol, consuming 30% as raw materials; sources of surfactant, agrochemicals, and antiseptic solution.
Plastics (Polyacetal)	Largest users, 2.93t formalin for 1t polyacetal
Derivatives (TMP, NPG)	Sources of polyurethane resins and powder coating paint.
Amine Derivatives (DMF, DMAC, Others)	Sources of polyurethane elastomer and elastic fiber; pharmaceutical base; rinsing agent of electric device; emulsifying agent and anticorrosive paint
Methacrylic Ester	High value-added product; market price in US$5-10/kg; sources for adhesives ”superglue”; agents for dental, textile softener, paints etc.
MMA, MAA	MMA: excellent weatherability, hard & crystal appearance; door panels, outside signboards, and an illuminator; high temperature coating. MAA: high water absorbing property; disposable diapers, sanitary napkins etc.
DME, other multifunc-tional alcohol	Sources for polyester fiber of textile, polyurethane resins (coating, plastics, etc.); sources for multifunctional amine chemicals.

Table 7.21 Methanol Production from Natural Gas by ICI Cupper-based Catalyst Process

Production capacity of Methanol		415,000t/year	
	Unit consumption	Total consumption/t	Daily unit (330 operation days/year)
Raw materials	Consumption/t		
Catalyst and others	0.00021t	87.15t	
Natural gas feed	7,778MMcal[*1]	358.56 mil. m^3	
Natural gas fuel	450MMcal[*1]	20.75 mil. m^3	
(Natural gas total)[*2]		(379.31 mil. m^3)	1,150,000m^3
Utilities			
Cooling water	108m^3	44.82 mil. m^3	135,800m^3
Steam	0.01t	0.00415 mil. ton	12.58t
Process water	1.2	0.498 mil. m^3	1,510m^3
Electricity	33kWh	1.37 mil. kWh	4,150kWh

[*1] MMcal = 1,000kcal as thermal energy units; 7,778MMcal = 864 normal cubic meters (nM^3) with 98 % purity of refined methane gas; 450MMcal = 50nM^3 of refined methane gas

[*2] 1.15 mln m^3/day changed to 1.82 mln m^3/day of make up gas with 62.4% methane purity

The details of formalin production are given in Table 7.22. The mixed methane and air are reacted in contact with catalyzer under an atomospheric pressure. Reacted formaldehyde gas is absorbed into water, and changed to 37% solution of folmalin. The synthesis process is selected in the lower or higher limit of the explosion range, 6-37 volume % of methanol. Recently, a new processing at the lower limit has been established to obtain higher contents of formaldehyde rather than excess methanol mixed in the product. Another way to produce formalin is by the direct oxidation process, which produces mixed products with 34-36% methane, 20-23% formaldehyde, and 5-6% acetoaldehyde.

Table 7.22 Folmalin Production from Methanol

Production capacity of Folmalin		200,000t/year	
	Unit consumption	Total consumption/t	Daily unit (330 operation days/year)
Raw materials	Consumption/t		
Methanol	0.4250t	85,000t	
Utilities			
Cooling water	0.04m^3	8,000m^3	24m^3
Steam	0.5t	100,000t	303t
Electricity	0.05kWh	10,000kWh	30kWh

Methyl methacrylic acid (MMA) is produced by the aceto-cyan-hydrine (ACH) method to synthethize MMA from acetone and hydrocyanic acid, or by the isobutylene method. The total production capacity in the world is 125,000t by the ACH method and 322,999t by the isobutylene method. Details of production by the isobutylene method are given in Table 7.23.

The process to produce MMA from isobutylene through methacrolein is comparable to the ACH method. The latter, however, has several difficulties such as the acquisition of hydrocyanic acid (HCN), toxicity of HCN, transportation of HCN, and disposal of used sulfuric acid. By the ACH method, raw materials can be easily acquired such as isobutylene (IB), tertiary butanol and methanol. IB oxidation is followed by direct oxidative-esterification of methacrolein (MA) without intermediate MMA production.

IB undergoes vapor-phase oxidation at 350°C and 3.4 atm in a multitubular reactor to produce MA. The conversion of IB is 97.4% and the selectivity to MA is 87.2 mol % by the specific mixed metal catalyst. MA stream is then oxidized and esterified with oxygen, and the excess methanol in a single reactor. The slurry-phase reaction takes place at 80°C and 3.77 atm in a stirred tank reactor with other catalysts. The conversion of MA is 84.7% and the selectivity to MMA 88.8 mol %.

The overall yield of MMA through other additional processing processes is 75.5 mol % on IB and 94.2 mol % on methane.

Table 7.23 MMA Production from Methanol and Isobutylene via Methacroleine

Production capacity of MMA		50,000t/year	
	Unit consumption	Total consumption/t	Daily unit (330 operation days/year)
Raw materials	Consumption/t		
Catalyst and others	0.0007t	0.035 thousand ton	
Caustic soda	0.010438t	0.522 thousand ton	
Isobutylene	0.750360t	37.50 thousand ton	114t/day
Methanol	0.340639t	17.03 thousand ton	51.6t/day
Hydroquinone	0.0007t	0.035 thousand ton	
Utilities			
Cooling water	357m^3	17.85 million m^3	54100m^3/day
Steam	3.5t	0.175 million ton	530t
Natural gas	430 1,000kcal	2.39 million m^{3*}	7240m^3
Electricity	166kWh	8.30 million kWh	25,200kWh

* Natural gas of 430,000kcal was calculated to 2.39 mln m^3 for total 50,000MMA ton by the factor 9,000kcal/nM^3.

For this model, the IB raw material is purchased from the refinery or the naphtha cracker of petrochemical complex in Atyrau. IB is included in the extraction residue of butadiene and butane-1 of carbon-4 parts at the plant. For instance, contents of IB are estimated 8% of feed oil on the refinery plant in general, varied in 3-10% depending on the feed oil quality. The Atyrau refinery with the planned capacity of 104 barrels/day has a potential content of 240,000t/year of IB ingredients, calculated based on 60% of annual operation of the facilities.

(3) Measures to promote the derivative industries cluster

The proposed derivative industries cluster consists of the main methanol based derivatives production, and other related downstream activities of the oil and gas industries. The latter include the gas use as thermal energy for greenhouse or industrial agriculture, plastic transformation and others. The environmental considerations should also be part of the cluster not only to minimize the pollution by littering of plastic products but also to recover utilize waster materials for production purposes.

Greenhouse or industrial agriculture

Greenhouse or industrial agriculture should be promoted to produce high value crops. Promising crops include fresh vegetables, berries, flowers and ornamental plants, and tree seedlings. Support measures are proposed in the rural livelihood development program under the Living Environment Improvement Initiative. Greenhouse agriculture may be experimented first by the Oblast initiative, including the local manufacturing of materials and equipment. A lesson may be learned from successful application in other countries such as Japan. Large-scale greenhouses in Japan cost typically KZT 100-300 million.

Plastic transforming plants

The establishment of plastic transforming plants should be encouraged to add depth to the petrochemical industries in Mangistau. They would produce mainly common commodities to substitute import products. Possible products include plastic emission products, packaging films manufacturing, PVC cast products such as window frames, and fishery and leisure boats manufacturing. These industries would naturally develop as the main activities of methane based

derivative industries in Mangistau and the petrochemical complex in Atyrau develop.

Environmental measures

As mentioned in sub-section 6.3.2, the development of green business would symbolize the Mangistau regional development, which the residents can be proud of. The development of the derivative industries cluster would contribute to it through improving the diet of local people, supplying fresh vegetables and berries, and flowers and ornamental plants to urban and tourism markets, and producing seedlings for tree planting.

To minimize possible negative effects of the development of derivative industries, countermeasures should be formulated together with the planning for derivative industries. The cluster approach would be effective in utilizing wastes and byproducts to minimize the overall wastes. The plastic recycling business should be introduced with incentive measures, and environmental education should be strengthened to enhance the environmental awareness of people and enterprises.

7.3.4 Tourism cluster support program

(1) Existing policies for tourism development

Mangistau is at the initial stage of tourism development, and thus tasks for development of tourism need to be extended to all directions. Well understanding the situation, the Akimat of Mangistau Oblast ordered formulation of the Tourism Masterplan Mangistau 2015, conducted by a team of German experts. The master plan was approved by the Oblast Akimat in the end of November, 2007 as the basic policy for the development of tourism in the Oblast. The master plan focused on identification of potential tourism destinations and activities, demand forecasts, and necessary tourism facilities/infrastructure development. The potential for Mangistau's tourism development were clarified as the following:

- Large interest potential for "Sun & Beach Holiday at the Caspian Sea"
- Considerable interest potential for "Cruising the Caspian Sea"
- Smaller nevertheless noteworthy demand potential for "Tours through Mangistau", and
- Business/conference potential coming from the growing oblast capital "Aktau".

Corresponding to these potentials, development priorities were set as follows:

First priority:	Creating a large internationally competitive Sun & Beach destination in the Kazakhstan Gulf. Based on comprehensive nature/spatial analyses, the Kenderli bay proves to be an ideal priority location.
Second priority:	Developing a Mangistau tour destination network tapping into the natural beauty and cultural highlights of Mangistau for national and international visitors on tours of Kazakhstan.
Third priority:	Solutions should be elicited on establishing Aktau as an international business, meeting and conference center with a pull across all the countries in the Caspian region.

(2) Components for tourism cluster support program

The tourism cluster support program basically covers all the existing project ideas described in the Tourism Masterplan Mangistau 2015, with slight modifications when it seem to be necessary in the light of the integrated regional development points of view. In addition to those existing projects, the program recommends human resources and tourism industry development, which are not covered in the Tourism Masterplan. Components for the tourism cluster support program are

listed below.

1) Tourist destinations development
   - Kenderli beach resort complex development
   - Natural parks development
   - Aktau tourist attractions development

2) Tourism infrastructure development
   - Cruise pier construction
   - Tourism transport infrastructure development
   - Tourist service points development

3) Human resources and tourism industry development
   - Tourism human resources development
   - Tourism industry enhancement

(3) Projects

Kenderli beach resort complex development

As clarified to be the first priority, a conceptual development plan for the Kenderli Beach Resort Complex was formulated in the Tourism Masterplan, based on the following concepts:

The establishing of a new, attractive holiday resort at the Caspian Sea would
- close a market gap in the region,
- be without competition in the area of the Caspian Sea, and
- attract tourists not only from Kazakhstan and Russia but also from other neighboring/foreign markets.

The location is set at the northern part of the Kenderli bay, considering the preservation of the areas' unique nature reserve, protection of UNESCO-declared "protected areas" (including a buffer zone of 2km), conditions of the land ownership structure, and integration of the existing tourism resort. The visitor demand in 2015 was forecasted to reach 300,000 tourists per year, consisting of 46% Kazakhs, 42% Russians, and 12% from other international markets including Great Britain and Germany. Based on the demand forecast, the development size of core resort facilities were determined as summarized in Table 7.24.

In addition to the accommodation facilities the project includes the following sub-components:

- Construction of water desalination plants, seawater treatment plants as well as greenhouses to supply the Kenderli beach resort (close to the resort)
- Construction of a new international airport, 20km east of the new Kenderli beach resort (Kenderli Beach International Airport)
- Construction of a new city primarily for the employees and their families (the new "Kenderli City)
- Expansion and remodeling of "Temir-baba" holy site at the southern end of the Kenderli bay
- Construction of a Beluga nursery in the Middle of the Kenderli bay (especially for the protection of "sturgeon")
- Individual large exclusive villas in the Kenderli gulf
- A new "Panoramic electric train", from Aktau to Kenderli via Kuryk

The total investment costs amount to approximately US$2.5 billion, consisting of US$1.7 billion by private investment, US$600 million by public investment, US$100 million by public-private

partnership (concession), and US$100 million by public incentives and benefits. In order to invite private investors, provision of following incentives is being discussed:

- Declare the Kenderli Beach Resort as a tax free zone
- Provision of interest-free investment loans
- Offering of a break-even guarantee for hotels, e.g., for the first three years

Table 7.24 Planned Volume of Accommodations by Type

Accommodation type	Domestic market		Russian market		Other int'l markets (UK & Germany)		Total beds forecast		Total rooms forecast		Total buildings forecast (w/ av. # of rooms)
	Beds	%	Beds	%	Beds	%	Beds	%	Beds/ room	Rooms	
First class / 5-star hotels	1,270	13	1,230	14	300	12	2,800	13	2	1,400	Four 5-star hotels (280 rooms)
4-star hotels	500	5	2,350	27	700	28	3,550	17	2	1,775	Seven 4-star hotels (96 rooms)
3-star hotels	850	9	1,950	22	1,000	40	3,800	18	2	1,915	Seven 3-star hotels (274 rooms)
2-star hotels	470	5	530	6	300	12	1,300	6	2	650	Two 2-star hotels (325 rooms)
Holiday club hotels (3-star)	1,300	13	250	3	200	8	1,750	8	2	875	Three Holiday Club Hotels (292 rooms)
Total hotel accommodations	4,390	44	6,310	72	2,500	100	13,200	62			
Comfort cottages / houses (3-star category)	1,000	10	500	6			1,500	7	5/5	150 duplexes	150 comfort cottages (2 accommodation units for 5 persons)
Simple cottages (2-star category)	2,200	22	800	9	-	-	3,000	14	5/5	300 duplexes	300 simple cottages (2 accommodation units 5 persons)
Holiday apartments / Flats (3-star category)	1,900	19	1,100	12	-	-	3,000	14	3	960 apartments	4 apartment buildings (240 apartments 3 persons)
Camping/Yurt village	500	5	100	1	-	-	600	3	-	-	One camping ground and yurt village
Total non-hotel accommodations	5,600	56	2,500	28	-	-	8,100	38			
Total accommodations for tourists	9,990	100	8,810	100	2,500	100	21,300	100			

Natural parks development

Mangistau Oblast has precious natural ecosystems that also have considerable potential for tourism development. The Forest and Hunting Committee is responsible for management of state level protected areas, and the Department of Natural Resources of the Oblast is responsible for oblast level protected areas. Currently there are one state reserve (Ustyurt state reserve), two state zoological preserves (Akutau-Buzachinsky and Karagiye-Karakolsky state zoological reserve, and one state reserve zone in the Oblast. In addition, the Department of Natural Resource has proposed several more protected areas, such as Beket Ata, the northeastern part of Buzachi peninsula, western Karatao mountain, and coastal areas of Naragan peninsula. All of these areas have high potential for tourism.

The problem of protected areas in the Oblast is the lack of management; monitoring is hardly carried out except for the Ustyurt state reserve. The Tourism Masterplan recommends establishment of National Parks, but it is more realistic and time effective to designate these areas as oblast level protected areas, once an effective management system is established utilizing tourism sector activities and human resources. Management plans need to be formulated for protected areas network and for respective protected areas. Proposed protection areas are depicted in Figure 7.13. Characteristics of each are summarized.

- Ayrakti (480,000ha):
  The area includes a tremendous variety of scenic, geological, pale ontological, historical

and cultural highlights, stretching southeast to Shetpe. Ayrakti can be considered as the future National Park with the highest tourist attractiveness.

- Ustyurt (632,000ha):
  The area is the only existing National Park in the Oblast at present. Ustyurt is characterized by typical dry steppe desert landscapes. Besides a variety of plants, Ustjurt has extensive bird and animal/reptile species. Although Ustyurt already exists as a natural reserve, the territory should be expanded in order for the better protection of the nature.

- Karakiya-Karakolskiy (180,000ha):
  The protected area comprises two parts: Karakya, one of the deepest depressions in the world (132m below sea-level) and Karakol, a long freshwater lake located at the south of Aktau, with flamingo settlements. These should be combined for the better protection and utilization.

- Kulaly Island (4,500ha):
  This is a crescent shaped island located north of Fort Shevchenko, and is largest of the Seal Islands Archipelago. Due to its favorable conditions for sea birds there is a large variety of species observed, including pelicans. The island is also located on the migration ways of herring, grey mullet and sturgeon fish, and thus numerous Caspian seals can be found on the beaches.

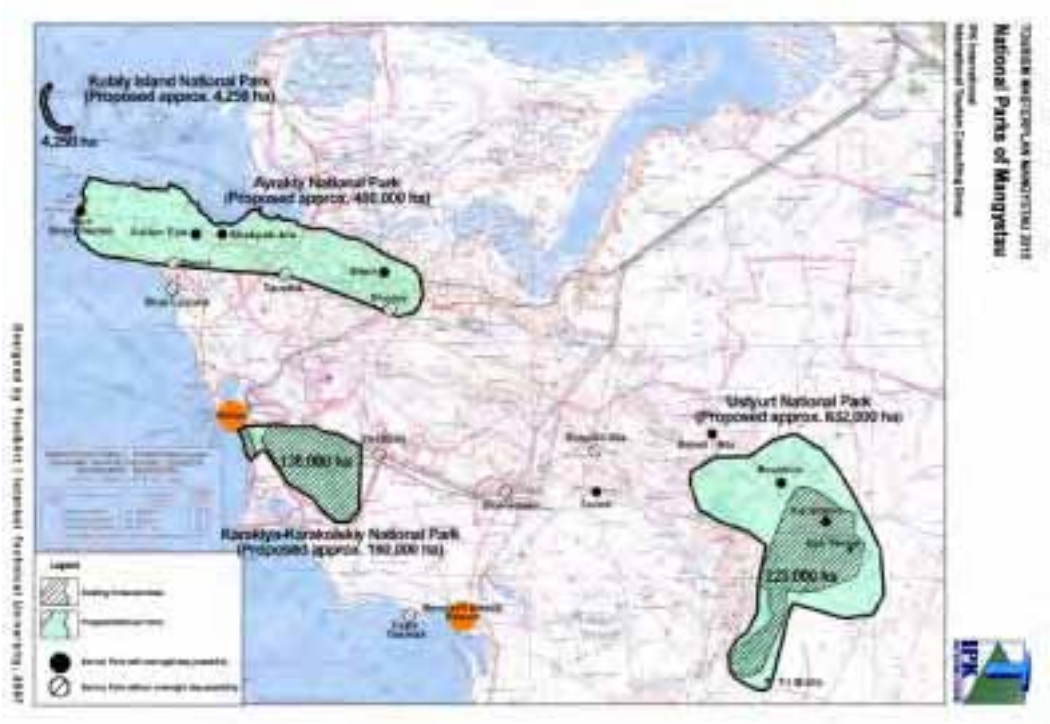


Figure 7.13 Proposed National Parks by Tourism Masterplan

Major project activities are as follows:

- Establishment of protected areas
- Formulation of management plans for both protected areas network and respective protected areas
- Infrastructure development for tourism (access roads, sign posts, tourist information centers, etc.) based on the management plans

- Carrying out of regular monitoring, database development, habitat evaluation for endangered species
- Carrying out of tourism promotions such as tour route planning and advertising,
- Conducing of environmental education at protected areas
- Water sport development at Karakul state zoological preserve
- Introduction of organized tours and commercial activities

Aktau tourist attractions development

The existing plan of New Aktau City development focuses on the tourism factors, and a prominent tourism oriented real estate developer has joined to the development entity of the development project. Thus, most of the following tourist attraction facilities would be implemented in the New Aktau City development project.

1) Hotel accommodations: The Aktau city currently has approximately 700 beds (including Stigl). However, most of these accommodations do not reflect the necessary quality standards. According to the demand forecast by the Tourism Masterplan, approximately 4,000-5,000 beds are needed comprising 20% of 5-star, 30% of 4-star, 30% of 3-star, and 20% of 2-star categories.

2) Caspian Sea convention center: In line with the strong economic development trend, a modern convention/MICE center should be developed. The best location for such a new convention center would be right on the sea as suggested in the New Aktau City Development Master Plan). The new convention center should be a multi-functional center designed to accommodate such types of events as the following:
   - National and international conferences/conventions
   - National and international fairs & exhibitions
   - International/annual meetings of global firms
   - Concerts and other cultural events/festivals
   - Balls/weddings/gala dinners/special parties/ceremonies, etc.

3) Mangistau museum: As the gateway of the Mangistau Oblast, Aktau city should have a new museum, offering the history, cultural and natural treasures of the Oblast and may be extending to Kazakhstan. Those mineral resources can be a good attraction if portrayed in a modern and interesting manner. A scientific institute, museum shop and food outlets (restaurant, cafés, etc.) would ideally complement the museum.

4) New golf center: An attractive new golf center should be created both for the locals as well as the numerous foreign businesspeople just visiting Aktau. Major components are as follows:
   - 36-hole course
   - Driving range
   - Clubhouse with restaurant

5) New sport center: The growing city of Aktau should also have a new, modern sport center offering both indoor and outdoor sports like for example: tennis/squash, volleyball/handball, swimming, gymnastics, fitness clubs, etc. The new sport center is to be complemented by catering vendors as well as premises to house sport associations.

6) Diving center: A new international school for divers should be located in Aktau as the 18th school in the world. This school will provide a professional diver training course for divers from Kazakhstan, CIS and other countries and issue international IMCA and IDSA certifications. This school will also house the undersea medical center, where undersea experts from Kazakhstan and other countries will undergo check tests.

7) Beach improvements: As a short-term measure, the Aktau City should improve its beach attractions. With relatively small investment, beaches could be transformed into attractive spots for both locals and visitors. The Tourism Masterplan recommends clearing of flat sandy areas by eliminating all the existing buildings. This may be possible in the current vital secondary land market in Aktau city, though repurchasing of these properties might cost significantly to the Oblast Akimat. New buildings in the form of bars, cafeterias and beach clubs should be encouraged to be established on the hillside.

Cruise pier construction

For a stronger development of the cruise tourism from Aktau, the provision of modern port facilities such as piers and arrival/departure gates is necessary. Thereby, it should be verified to which extent already existing facilities can be used, respectively if completely new investments would be necessary (also see chapter "Caspian Sea Cruise Development").

Tourism transport infrastructure development

Apart from the Caspian Sea and its beaches, Mangistau's second most important tourism attraction is its landscape and culture. According to the Tourism Masterplan, there are market of Kazakhstan, Russia and other international tourists interested in taking shorter or longer tours through Mangistau. The demand forecast describes 30,000 tour travelers for Mangistau per year consisting of 69% Kazakhs, 19% Russians, and 12% tourists from other international markets. A series of 14 different attractive shorter and longer tours are formulated in the Tourism Masterplan as listed below (Figure 7.14).

Tour 1:	Karatau Mountains and the Holy Desert Places	(9 days/8 nights)
Tour 2:	Karatau Mountains, Desert and Kenderli	(9 days/8 nights)
Tour 3:	Karagije Depression & Ustyurt Natural Park	(8 days/7 nights)
Tour 4:	Temir-baba	(day excursion)
Tour 5:	Shopan-Ata and Beket-Ata	(3 days/2 nights)
Tour 6:	Aktau City Package	(3 days/2 nights)
Tour 7:	Ustjurt National Park	(5 days/4 nights)
Tour 8:	Kayasan Plateau - Wildlife Refuge Tour	(day excursion)
Tour 9:	Aktau City Tour	(day excursion)
Tour 10:	Karatau Mountains	(3 days/2 nights)
Tour 11:	Karatau Mountains North	(5 days/4 nights)
Tour 12:	Caspian Sea, Necropolises and (western) Holy Places	(4 days/3 nights)
Tour 13:	Saura	(day excursion)
Tour 14:	Kulaly Island National Park	(2 days/1 night)

A basic requirement for realizing these tours is a considerable improvement in the infrastructure (roads, water, electricity) and the establishing of appropriate service facilities (accommodations, dining options, gas stations, etc.). Regarding the transportation infrastructure, roads for the northwards tours starting from Aktau are better available and may be improved as these areas accommodate many rural settlements. For the eastwards tours, on the other hand, there are very limited segments of paved roads, and the access to the area requires significant time of ride on dirt roads. Thus establishment of easier access to the east and southeast areas are critical to the tourism development.

At the planning of access routes to the eastern tourist destinations, it is recommended that a circular course be formed allowing tourist to avoid going and coming back on the same route. In this light, south-edge link of the Ustwst National Reserve to the planned Kenderli Resort Complex should be established. The planned railway connecting to Turkmenistan is considered as a major break through to establishing the access from Aktau via Zhanaozen to Ustwrt as the railway will be

constructed passing near the Natural Reserve. In addition to the rail and road connections, it is worth establishing airstrips, which make it possible to access these remote tourism destinations in a short time by small airplanes.

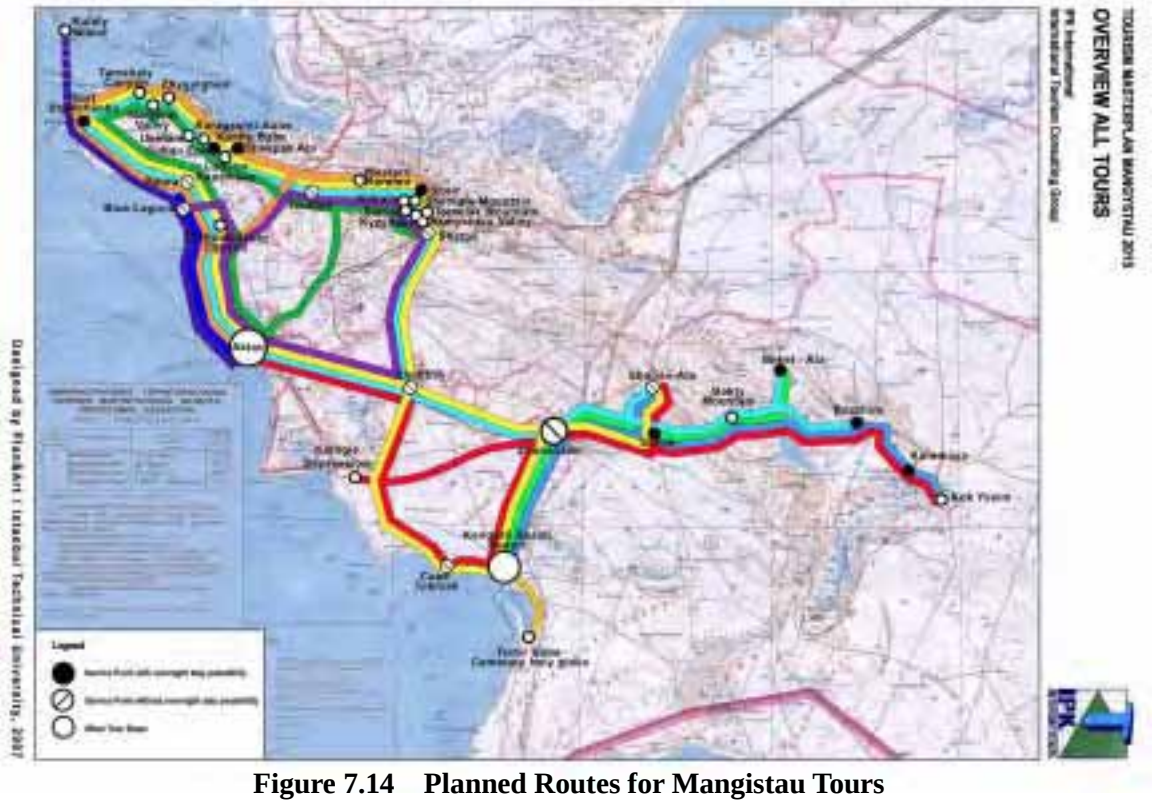


Figure 7.14 Planned Routes for Mangistau Tours

Zhanaozen-Kenderli circuit road

The project will establish a circuit road to serve tourism purposes. The road will pass Senek in the west of Zhanaozen, and connect to Kenderli by the Ustwrt tourism area. The road length is about 350km, which is mostly unpaved. The road will have limited traffic mainly for weekend and holiday tourists, but two lanes should be provided in both directions to allow effective bus services and extension to the Turkmenistan border in the future. The Oblast government is expected to take the initiative for implementation and maintenance. The project cost is estimated to be US$76 million.

Tourist service points development

In order to meet the development needs of tourism supporting infrastructure, introduction of tourist service points is recommended. This is also suggested in the Tourism Masterplan identifying 17 service points along the tour routes as depicted in Figure 7.14. Among them, nine service points are classified as overnight locations, while the remaining eight sites including Zhanaozen are determined as non-overnight locations for tour travelers. In the viewpoints of the integrated regional development planning, significant accumulation of assets and in-land location are strategically important. Future function of Zhanaozen will be shifted to the service center for the inland remote areas, and thus it is recommended that the city should be classified as overnight and even higher service point functions, including high quality dining and other urban based tourist attractions.

Tourism human resources development

Because of the fact that tourism is recognized as one of the promising sector only recently, there is very limited number of experienced personnel for tourism. Although there are significant increase in the number of tour agencies and operators in the last few years, it is not sufficient to meet the demands in the near future, in both size and quality. In order to increase the numbers of qualified staff for tourism services, a series of training should be provided. In the large-scale development such as Kenderli Resort Complex, training for the staff will be provided by the operators. For the services in smaller scale facilities and tour activities, the person in charge may not have a chance to acquire necessary know how to effectively satisfy demands of international tourists. Thus it is necessary to provide government support for these small-scale agents/operators to acquire at least basic know-how for tourist services as well as keeping the level of services at higher level.

These supporting activities include the following:

- Establishment of oblast level tourism industry association
- Establishment of oblast's original certificate for tour agencies, operators, guides and instructors, which will require a basic knowledge of the Oblast, such as history, ethnicity, flora and fauna, in order to effectively respond to visitors' interests

Tourism industry enhancement

Enhancement of tourism industry is also a key factor. Currently, establishing a enterprise of tour agency/operator is not easy for the local population, since it requires bachelor of tourism which is only acquirable at a university in Almaty, or certificate of long-time work experience in the existing tour industry. This seems to help keeping the service level at certain level, but becoming to be a major barrier for the new entry to the industry. Under the condition, enhancing the existing enterprises is one of the major options to increase qualified human resource and quantity of services.

Discussions with persons in the tourism industry have revealed that they have difficulty in marketing and financing, and thus it is difficult for them to expand the scale of activities and hiring additional personnel. To cope with the situation, Establishment of an oblast level tourism industry association is desired. The association may function as the following:

- Carryout market research and publicize the results,
- Coordinate trainings and seminars inviting international recognized instructors/experts,
- Coordinate with the government for information exchange and policy making for tourism development, and
- Collect business related information such as micro-credit and other financial support schemes.

Title	**Zhanaozen-Kenderli circuit road project**
1. Location	Western region of Oblast, Ustyurt region in Karakiya rayon
2. Implementing Agency	Oblast Transport Department
3. Objectives	1) To improve the access to the Ustyurt area famous as tourism resort region in Mangistau 2) To establish the circuit route with Kenderli 3) To support tourism promotion with railway for Turkmenistan planned through the area
4. Expected Effects	1) Promotion of tourism in the Ustyurt area and circuit with the Kederli area 2) Road services to several settlements located in the west of Zhanaozen

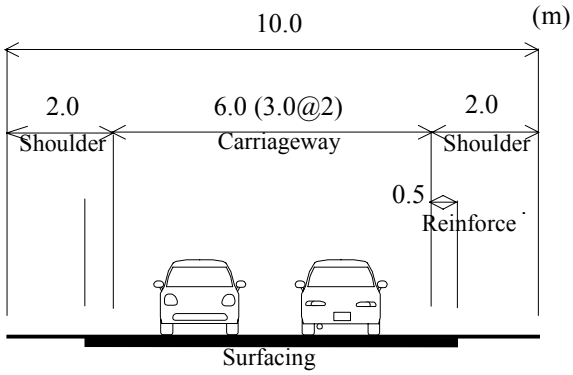
	3) Support for the regional economic growth leading to railway development near the site connecting to Turkmenistan.
5. Phasing	Phase 2-3
6. Investment Costs	US$76 million
7. Descriptions	

Outline

It is a circuit road for tourism, which passes Senek located in the west of Zhanaozen, and connectes to Kederli via the Ustyurt tourist resort area. The length of section is about 350km and most of it is unpaved or no route. It seems that most traffic demand is for tourism on weekends or holidays, and the demand is small. However, it is proper to reserve two lanes for both directions considering bus services for tourists and extension of road to the Turkmenistan border in future.

Typical cross section

Typical cross section was set up in accordance with Category-IV by road structure standard in Kazakhstan.



7.4 Living Environment Improvement Initiative

7.4.1 Rural livelihood development program

(1) Background

Rural development policy

To improve the living conditions of rural settlements, the Government launched the National Rural Development Program 2004-10. The program supports construction, repair and reconstruction of social and engineering infrastructure in rural settlements, depending on the socio-economic conditions of different settlements that are analyzed and monitored as part of the program. The program completed its first phase 2003-06, and now in the second phase 2007-10.

Rural population and settlements in Mangistau

Approximately 140,000 people or 37% of the total Oblast population live in the rural areas of Mangistau. There are 52 rural settlements in the Oblast. The rural development program classifies the rural settlements into three groups based on their priority. In Mangistau, Kuryk is

the only settlement classified as high priority and eight other as low priority with the rest as medium priority (Table 7.25).

Table 7.25 Rural Settlement Priority Classification

Category	Applicable settlement	# of settlements
High priority	Kuryk	1
Medium priority	All other rural settlements not included in High and low priorities	43
Low priority	Bostankum, Kizilsu, Tulep, in Karakiyan rayon; Zharma, Sazdi, 15 Beket, Baskuduk, Tasmurin in Mangistau rayon	8

Rural livelihood

The livelihood of rural settlements is supported by agriculture, except areas close to oil fields. Livestock raising and limited processing are by far the dominant activities. Crop cultivated area in 2006 was 312ha, increased by 2.8 times from 118ha in 2005. Approximately a half of the area (51%) was used for melon production and the rest for vegetable production. In 2007, crop cultivation has increased by 59% to 497ha.

Rural infrastructure

Many settlements in rural area depend upon underground water resources in Mangistau Oblast. According to the village monitoring 2006, water is supplied by either centralized systems (19 settlements) or truck distribution (33 settlements) based on groundwater.

Majority of villages in Mangistau have no asphalt roads. The lack of public bus services is also reported as problems especially in Beineu. All the settlements except for Tashen in Beineu newly established in 2006 have power supply, but many peasant farms outside villages are not connected to the power supply system. Most settlements have either centralized gas network or propane gas distribution. All the settlements will have gas distribution by the end of 2008.

(2) Issues for rural livelihood development

Other than those employed by oil companies, rural people in Mangistau depend on livestock and limited other activities for their livelihood. Livestock activities will be supported by the livestock support sub-program proposed below. Other activities should also be supported to diversify the rural livelihood, particularly crop cultivation and poultry. Most critical constraint to livelihood development in Mangistau is the limited availability of water. Especially, the use of groundwater should be improved through restoration of oil wells and reservoirs and better management. Improvement of transportation is another key condition for rural livelihood development through ensuring access to social services and facilitating marketing.

(3) Sub-programs and projects

1) Livestock support sub-program

Background

i) Livestock farms and enterprises

Except for salaries from oil and gas production, livestock production remains as the major income sources in the rural society of Mangistau Oblast. The livestock sector, however, is disorganized through the land reform and the introduction of market economy, following the collapse of the Soviet Union. State farms were divided into individual farms, peasant

farms on 49 years lease agreements, and agricultural enterprises such as a joint stock company, limited liability partnership, cooperative, and government enterprise.

Individual farms graze in the common land of 7km in circumference from the village boundaries, and their productivity is generally much higher than peasant farms. Two-thirds of livestock are produced by individual farms. The common land in circumference, however, tends to be overgrazed due to high stocking rate of individual farms, potentially causing pasture degradation and desertification. About a half of peasant farms are not operating because of the lack of finance, difficulty in obtaining water and other farm input, low living standard or availability of other income opportunities, mainly at oil companies. Some former Sovhoz farms have been reactivated as private companies, while those that could not remain as inactive cooperatives.

Some limited liability partnerships have demonstrated positive actions for intensifying livestock production systems in the market economy. Notable ones include a limited liability partnership in Senek with new investment in facilities for wool processing, and a limited liability partnership in Taushek with successful camel milk/fur sales. The advantages of these companies are their relationships with oil companies providing investment and market due to their location near the oil fields.

ii) Livestock production

Milk produced in Mangistau Oblast covers approximately 20% of the regional consumption. Most of milk produced is consumed at home. Milk sales in Mangistau consist of camel milk processed by two enterprises in Taushik and Zhanaozen, milk produced from powder milk by four enterprises in Aktau and Zhanaozen, horse milk produced in Senek, and cow milk produced at individual houses. Due to high prices of powder milk, the capacity of powder milk producing enterprises is not fully used. Cow milk produced exclusively in individual farms suffers from low productivity due to lack of fodder.

Meat production in Mangistau Oblast covers only 23% of the demand in the region. Regarding the processed meat, mere 5% is produced in Mangistau, composed of mutton (59%), camel meat (22%), horsemeat (14%), and beef (5%). Approximately 200,000 sheep are slaughtered annually, 56% from individual farms, 28% from agricultural enterprises, and 16% from peasant farms.

Karakul breed sheep are well adapted to the climate of the region prevail in Mangistau Oblast. Karakul produce high quality lambskin, but adult liveweight (approximately 20kg) is lower than other breeds. In addition due to its black color and thicker wool, it is difficult to find market for wool and leather. Sheep meat produced in Mangistau is not much sold in the Aktau market due to the lack of connection from the rural areas and lower quality than those from Kostanai and Uralsk.

Strategy for livestock development

i) Livestock farmers organizing

In order to revitalize the livestock production in Mangistau Oblast, the farms need to become competitive in the market economy. Land reform has been carried out in Kazakhstan, forming peasant farms and private companies although large cooperatives remain as low productive units. In order to make public support more effective avoiding enlarging economic disparities between farmers, small farms need to be reorganized into larger units. Individual farms should be reconsolidated into village farms, while peasant farms should form associations for business purposes keeping their own lands. Some

cooperatives or possibly groups of peasant farms may form a private company by sharing the capital by themselves.

ii) Government supports to organized farmers

Government's roles are to develop financial mechanism, introduce modern technologies, and provide market information to support farm groups. The government can encourage farmers to reorganize themselves by making it a prerequisite for the support system.

iii) Expansion of water and land availability

The shortages of water resources will be reduced by restoring old wells for both human and animal uses. Significant increase of stocking rates can be expected after restoring wells through credits provided by state supports. Some water reservoirs constructed during the Soviet era may be selectively restored as well. The installation of windmills for water pumping can be considered for isolated windy areas. After livestock production becomes more profitable, the utilization of summer pasture in the southeast Mangistau can be explored in the long run depending upon the economic situation of the Country.

iv) Breed replacement and value addition

Breed replacement needs to be carried out for higher marketability of livestock products. Percentage of Karakul sheep should be reduced gradually (targeting at 30% of herds). However, in the meantime, utilization of Karakul skin for sales and simple wool processing should be explored. Wool production can start in small scale at the village level by using local women's workforce and then expanded as the market develops. Further value addition to produce leather/wool clothes would be the final target for wool manufacturing.

v) Animal health

In order to improve productivity, enhancement of veterinary service for sanitary and epidemiological control on livestock is needed. According to rural survey by JICA, currently only 62% of farms use vaccination at birth of lamb. Veterinary service is carried out by private doctors without state support. Specialists of sanitary and epidemiological control on livestock can be trained in villages. Village veterinary services should be gradually developed, from rayon centers to major settlements.

vi) Winter forage production

The lack of forage for winter fodder is the main cause of low livestock productivity. Forage production should be undertaken more systematically under a management plan to be prepared. The production can be expanded as water availability is improved through the restoration of wells and reservoirs. The water resources can be explored by expanding springs at the bottom of cliffs at the edge of the Ustyurt plateau or the installation of windmills at isolated well as mentioned above.

vii) Core development areas

Efforts to revitalize the livestock sector should be concentrated in selected areas of superior potentials with respect to land and water availability and access to markets. Investment should be first concentrated in Mangistau rayon (the corridor between Shetpe and Taushik), then to Beineu and Karakiya (Senek and Akkuduk) rayons where livestock production is more concentrated. The target markets would be rural areas of Mangistau Oblast (rayon centers) in the first phase and then expand to Aktau and other domestic markets. The final goal is to export livestock products to CIS countries.

Scenario for livestock development

The livestock sector in Mangistau needs to be completely restructured to survive in the market economy. In the initial phase (2008-10), the base for modern livestock production should be developed. Subsequently, the productivity should be enhanced for milk and meat production and other processing. In the long term, the livestock production in Mangistau should be characterized by products of high quality. Actions to be taken through these phases are summarized in Table 7.26.

Table 7.26 Development Scenario for Livestock Production and Rural Development

	Short term 2008-2010	Medium term 2011-2015	Long term 2016-2030
Objective	Develop bases for introducing modern livestock production	Enhance productivity and expand market	Sustain the level of production with higher quality
Model target development area	Mangistau rayon (Shetpe-Taushik corridor)	Beineu, Senek and Akkuduk	Increase the number of animals for summer pastures in Southeastern Mangistau
Farm structuring	- Reconsolidate individual farms into village farms - Increase the number of peasant farms - Formulate private companies from remaining cooperatives	Formulate associations from peasant farms	Three types of farm units (village farms, peasant farms with associations & private companies)
Target market	Rayon centers and oil fields	Aktau and other domestic markets	International market (Iran & Russia)
Milk production	- Increase camel milk production by increasing the number of camels - Introduce intensive cow milk production	Introduce manufacturing with camel milk	Higher milk productivity and value added
Meat production	- Replace a larger number of Karakul sheep (target 50%) - Increase camel and horse production	Lower the share of Karakul sheep (target 30%)	Diversified herd structure (various sheep, horse and camel) for market
Veterinary service	Introduce village veterinary service at rayon center	Increase village veterinary service up to 20 settlements	Veterinary service made available at most villages
Agro-industry (value addition)	Introduce small-scale wool/hide production at village level	Develop wool and leather production	Production of clothes with leather/wool
Water resources development	Small well restoration for human and agricultural use	- Small well restoration for animals - Renovation of water reservoirs	Full utilization of water potential for livestock production
Forage production	Introduce systematical hay production	Expand hay production area by watering and small infrastructure	Increase production in winter
Crop production	- Drip irrigation trials - Introduce small scale crop production at peasant farms	Improve productivity and increase the number of farms with crop production by water supply	Maintain certain level of local food production

Projects

The livestock support sub-program consists of the following component projects. A profile of each project is attached.

- Breed improvement program
- Milk processing model project by organized farmers
- Village wool processing project
- Technical training for leather production
- Local veterinary services development project
- Livestock research and extension center
- Forage reserve development project
- Rangeland management fund

Title	**Breed improvement program**
1. Location	Mangistau Oblast
2. Implementing Agency	Oblast Department of Agriculture
3. Objectives	To replace Karakul sheep with more productive breeds
4. Expected Effects	1) Improvement of sheep productivity 2) Increase in income for livestock farmers 3) Reduction of disparity between urban and rural populations
5. Phasing	Phase 1-2
6. Investment Costs	KZT 360 million (350 million for sheep replacement and 10 million for pilot farms in Senek)
7. Descriptions	
Currently approximately 400,000 sheep are existent in Mangistau oblast. Of this total, 70% is Karakul breed that is largely favored for lambskin. Liveweight is low and black color is not favored for wool/leather and traditional feasts with heads. It is important to increase the number of more productive breed in order to improve livestock productivity. A special program of breed selection of 2006-2010 was initiated. The new breed of sheep, Edilbaiskaya, was delivered in 2006 in the limited liability partnership of Senek. However, they have not yet been introduced to peasant and individual farms. The Government can subsidize farmers to purchase new breeds. Peasant and individual farms can be organized in order to receive the public support. The government can also establish pilot farms to increase the number of appropriate breeds. LLP Senek restored artificial insemination of sheep. This technology could be utilized for the expansion of new breeds. Activities - Provision of technical training about introducing new breeds and economic benefits - Subsidization for purchase of more productive sheep breed - Establishment of pilot farms to rear more productive sheep Beneficiaries Organized peasant/individual farms and LLP's	

Title	**Milk processing model project by organized farmers**
1. Location	Rural/urban center (Aktau, Zhanaozen, Taushik, Shetpe, etc.)
2. Implementing Agency	Department of Agriculture and KazAgrofinance
3. Objectives	To increase camel/cow milk sales from rural area
4. Expected Effects	1) Increase in milk production for livestock farmers 2) Increase in the share of locally produced milk in Mangistau oblast 3) Increase in income for livestock farmers

	4) Reduction of the disparity between urban and rural populations
5. Phasing	Phase 2
6. Investment Costs	KZT 50 million
7. Descriptions	

Milk production in Mangistau Oblast covers only 20% of the demand in the Oblast. This percentage is low considering the potential production in the Oblast.

The most common dairy product in Mangistau is Shubat, which is sour milk produced from camel milk. In Mangistau Oblast, 35% of the farmers produce camel milk. There is a potential to increase number of camels in the farms, particularly in peasant farms. Camel milk consumed in a form of Shubat has stable market in the large cities.

Milk sales in Mangistau Oblast are composed of camel milk processed by two enterprises in Taushik and Zhanaozen. Cow milk is exclusively produced by individual farms with low productivity due to lack of fodder. Cow milk sold in Aktau is imported.

In order to obtain stable market, processing facilities is needed. Peasant/individual farms (or LLP) can be organized to form farmers' organization for processing camel/cow milk. Capital can be partly loaned by Kazagrofinance. Shops in large cities could also be operated by the farmers' organization. Milk can be taken to markets, city shops, rayon centers or to an enterprise with contract.

Activities
- Development of strategy for milk production in Mangistau oblast
- Organize farmers' organization for milk processing facility
- Provision of subsidies and low interests loan for machinery
- Marketing support

Beneficiaries
Organized peasant/individual farms and LLP's

Title	**Village wool processing project**
1. Location	Rural settlements and Mangistau Oblast
2. Implementing Agency	Oblast Department of Agriculture, KazAgrofinance and Mangistau Agroservice
3. Objectives	To increase sheep wool sales from rural area of Mangistau oblast
4. Expected Effects	1) Increase in income from wool sales for livestock farmers 2) Increase in value for locally available products 3) Reduction of the disparity between urban and rural populations
5. Phasing	Phase 1
6. Investment Costs	KZT 30 million
7. Descriptions	

Approximately 400,000 sheep are existent in Mangistau Oblast. The lack of market for wools and leather were pointed out as main problems in the rural survey by JICA. The current prices of wool and leathers are extremely low; rural people are obliged to discard them. Value addition at village level is needed in order to reach market to generate sufficient income for rural livelihood. In Mangistau the attitude of farmers tend to wait supports or investment by private investors or state enterprises. Farmers can be organized as associations to start small-scale wool processing.

The government can provide with subsides or loans for purchase of machinery, technical assistance, and market development. However, technical requirements for potential international markets (e.g. Turkey, China) are high thus it may be difficult for Karakul sheep to be accepted without technical innovation. The market of wool products can primarily focus on local markets, and gradually replace breeds with finer wool quality. This is a pilot project. In order to save water,

water recycle for wool cleaning can be installed.

Activities
- Development of strategy and implementation plan for wool production in Mangistau oblast
- Organize farmers' organization for wool processing
- Organize technical training for wool processing
- Provision of subsidies and low interests loan for machinery
- Marketing support

Beneficiaries
Peasant/individual farms

Title	**Technical training for leather production**
1. Location	Mangistau Oblast
2. Implementing Agency	Oblast Department of Agriculture, KazAgrofinance and Mangistau Agroservice
3. Objectives	To increase sheepskin sales from rural area of Mangistau oblast
4. Expected Effects	1) Increase in income from sheepskin sales for livestock farmers 2) Increase in value for locally available products 3) Reduction of the disparity between urban and rural populations
5. Phasing	Phase 1
6. Investment Costs	KZT 10 million (for training only)
7. Descriptions	

In Mangistau Oblast large amounts of leather is wasted due to the lack of market. Karakul sheep is originally for lambskin. In order to sell sheepskin with acceptable price in Mangistau Oblast, value addition at local level is needed. A tanning factory can be constructed by farmers' organization formed by peasant or individual (village) farms shared with state enterprises. Peasant and individual farms provide skin and tanned at the factory. Marketing and product technology can be researched by support of public research institute. After leather is produced, cloth can also be produced depending upon markets. Primary market would be local. A tannery factory is already installed at LLP, Senek, but technical training for processing, wastewater treatment as well as marketing is needed.

Activities
- Development of strategy and implementation plan for sheepskin production in Mangistau oblast
- Promotion of farmers' organizations for sheepskin processing
- Provision of technical training for sheepskin processing
- Provision of subsidies and low interests loans for machinery
- Marketing support

Beneficiaries
Peasant/individual farms and LLP's

Title	**Local veterinary service development project**
1. Location	Shetpe, Mangistau Oblast
2. Implementing Agency	Oblast Department of Agriculture
3. Objectives	To develop local veterinary service at main rural settlements
4. Expected Effects	1) Reduction in the risk of animal diseases 2) Increase in farmers' income from livestock production by reducing animal deaths 3) Reduction of the disparity between urban and rural populations
5. Phasing	Phase 1-2
6. Investment Costs	KZT 140 million

7. Descriptions
According to the rural survey by JICA, 18% of the respondents faced some diseases of livestock in the last five years. Frequent diseases of livestock in winter were reported from some farmers. The main problems include high cost of inoculation, lack of veterinaries in the village, and high cost to go to veterinaries due to the distance from towns. In order to provide better veterinary service for local livestock production, local veterinary specialists can be trained. In Mangistau rayon there is a lyceum for basis of animal rearing and mechanization. The new vocational center on sanitary and epidemiological control on livestock can be established next to the lyceum. Certification system for sanitary and epidemiological control on livestock can be developed for graduates of the vocational center. When farms are organized as associations or village farms, representatives of the farms can be sent to the vocational training center. The new vocational center can be established together with the Livestock Research and Extension Center. Activities - Development of strategy and implementation plan for local veterinary service - Development of curriculum for veterinary training - Organize technical training for veterinary - Provision of subsidies for inoculation Beneficiaries Peasant farms, Individual farms, Agricultural enterprises

Title	**Livestock Research and Extension Center**
1. Location	Shetpe, Mangistau rayon
2. Implementing Agency	Oblast Department of Agriculture
3. Objectives	To develop Livestock Research and Extension Center in Mangistau Oblast
4. Expected Effects	1) Enhancement of technical levels/knowledge of livestock production in Mangistau oblast 2) Support of sustainable production/marketing for livestock production 3) Support for the development of methods to add values to livestock products 4) Support of livestock income for rural populations
5. Phasing	Phase 1-2
6. Investment Costs	KZT 80 million
7. Descriptions	
The rural survey by JICA demonstrated that rural residents in Mangistau Oblast are largely interested in increasing livestock production. Although oil industries will be developed in the Caspian Sea area, livestock production remains as a major voluntary income source in rural areas of Mangistau Oblast. However, technical know-how of livestock production is not accumulated in any one place. A service centers for livestock production can be constructed in order to provide technical assistance (e.g. optimization of forage, animal breeds, marketing, processing technologies) as well as research (e.g. marketing, finance) to local populations. A branch office of RGP (Southwest Agricultural Research and Production Center) can be constructed in Mangistau Oblast attached to the research center. The center can be established in Shetpe, as a center of livestock production in Mangistau. The center can be established with participation of livestock farmers. Activities - Develop a plan for establishment of Livestock Research and Extension Center - Organize farmer workshops for the work contents of the center	

- Develop materials for technical training and research
- Implement center activities

Beneficiaries
Peasant farms, individual farms and agricultural enterprises

Title	**Forage reserve development (Salt hay production)**
1. Location	Mangistau rayon
2. Implementing Agency	Oblast Department of Agriculture
3. Objectives	To increase hay production for winter forage in Mangistau Oblast
4. Expected Effects	1) Increase in livestock production by providing better winter forage 2) Increase in income for livestock farms 3) Reduction in the disparity between urban and rural populations
5. Phasing	Phase 1
6. Investment Costs	KZT 30 million
7. Descriptions	

The lack of winter forage is a problem of livestock production in Mangistau Oblast. In order to increase livestock production with better health conditions and heavier liveweight of animals, pasture reservation for winter forage is needed. Available hay is grown at the edge of the wadi or the bottom of hills where more moisture is available. Hay production can be expanded to the areas near natural wells, by simple civil techniques maintaining larger amount of rainwater for larger areas, or restored abandoned wells. Nutritional quality and salt tolerance of available grass species need to be studied. In Beineu 300ha of hay fields is available. Dry hay can be produced by cut and carry system by using mower and truck. The machinery can be leased by Mangistau Agroservice.

Activities
- Development of strategy and implementation plan for hay production
- Organizing technical meetings for interested farmers in hay production and specify hay production fields
- Establishment of hay fields
- Provision of credits or subsidies for renting machinery for hay production.

Beneficiaries
Peasant farms, individual farms and agricultural enterprises

Title	**Rangeland management fund**
1. Location	Ustyurt plateau, Overgrazed settlement
2. Implementing Agency	Oblast Department of Agriculture and Akimat of rural settlements
3. Objectives	To increase use of summer pasture with fund from overgrazed settlements
4. Expected Effects	1) Increase in livestock production by providing better winter forage 2) Increase in income for livestock farms 3) Reduction of the disparity between urban and rural populations 4) Reduction of pressure on desertification
5. Phasing	Phase 2-3
6. Investment Costs	KZT 40 million
7. Descriptions	

During the Soviet Union era, pasture resource of the Ustyurt plateau was largely utilized during summer for livestock production. However, currently the pasture is not fully used for production. On the other hand, due to the increased number of animals in individual farms who graze near the settlements, pasturelands near settlements tend to be overgrazed. If the investment on animal in

individual farms can be transferred to other farms that manage large rangelands in the Ustyurt plateau, they could be able to rear animals in a more sustainable ways.

It is possible to develop a special fund to carry out this process. A local bank can collect funds from rural settlers and invest them on the animals grazed in further rangelands for summer pasture. The fund can start from small amount and be partly supported by the government. The activities could be supported by fund source related to desertification.

Activities
- Development of strategy and an implementation plan for a rangeland management fund
- Development of financial mechanism for collecting available funds from overgrazed settlements
- Collection of funds from individual farms in overgrazed areas
- Grazing animals with summer pastures in the Ustyurt plateau

Beneficiaries
Individual farms

2) Crop production promotion project

Background

Crop production is least developed in Mangistau Oblast. The Oblast imports more than 90% of foodstuff required by residents, including fresh vegetables. Recently, the production of vegetables such as tomato, cucumber, eggplant, carrot, cabbage and watermelon started in Zhanaozen using the water transferred from the Volga river. Of the total irrigated area of 200ha, some 20ha is under drip irrigation and the rest under furrow irrigation. Irrigated agriculture has been practiced in Tupkaragan and Mangistau rayons since the Soviet era to produce mainly vegetables and fruits and berries.

Crop production under drip irrigation should be expanded in areas of better water availability. Vegetables and fruits/berries for local urban market, including tourism areas, should be the main target as the demand is very high, and would increase rapidly. While the opportunities for agro-processing would be very limited, such forms of agriculture that would induce other economic activities should be encouraged. Greenhouse agriculture and drip irrigation may induce the manufacturing of aluminum products, PVC pipes and rubber tubes, small pumps, water meters and other equipment and materials.

In addition to vegetables and fruits/berries, other high value products may also be produced in greenhouses and under drip irrigation such as ornamental plants and flowers, and tree saplings. Saplings may find an easy market if the Government or the Oblast undertakes tree planting in a large scale. Flowers may be produced during the off-summer season for direct export from the Aktau airport. Demand for ornamental plants would increase rapidly as the income levels of people increase and more multi-national enterprises establish their business in Mangistau.

Objectives

The objectives of the project are to diversify lucrative income opportunities for farmers by drip irrigation and greenhouse agriculture, and to induce the development of manufacturing industries supplying input to these cop production activities.

Description

The project would support not only the crop production itself but also all the related activities. Support measures should be introduced by the Oblast to encourage farmers to engage in greenhouse agriculture and drip irrigation. They may include the provision of subsidy or low interest loan for the purchase of equipment and installation, technical extension on fertilizer and

other input use, and facilitation of farmers organizing for joint procurement and marketing.

Greenhouse agriculture may be experimented first by the Oblast initiative, including the local manufacturing of materials and equipment. Manufacturing of small pumps and other equipment and materials for drip irrigation should also be encouraged. More pilot projects may be formulated and implemented to demonstrate viable schemes of crop production with respect to crops and seed selection, water and other input application, and alternative management models.

Greenhouse agriculture represents most intensive form of agriculture and potentially most water saving. Also the land availability would not be a constraint since it can be established in small plots of land just like industrial agriculture. Shetpe may be a promising site to establish the experimental greenhouses as the farmers there have long experiences in irrigated agriculture using local groundwater. Greenhouses can be established even in sloping land around the Shetpe settlement. Also, the availability of materials and equipment seems to be reasonable.

Horticulture under drip irrigation can be expanded in Tupkaragan and Zhanaozen. Production of flowers and ornamental plants may be undertaken in Aktau as well since the urban market and the airport are nearby.

3) Village poultry production promotion

While rural settlements in Mangistau Oblast face a problem of lack of income opportunities, poultry is hardly practiced by rural households. Poultry can be practiced relatively easily with low investment in villages. In fact, poultry production increased by 48% in 2006. In individual farms, 10-15 households are organized as one grazing unit for poultry activities. The grazing units can be organized as a production unit. Yurt can be utilized for keeping poultry.

4) Groundwater resources management project

A certain amount of groundwater resources is available particularly in the Mangistau rayon. There are quite a number of abandoned wells as well as water reservoirs, which were constructed during the Soviet era. In 1976, a dyke for water reservoir was constructed in the Mangistau rayon, but the reservoir was destroyed by heavy rain in 1991. In order to secure water resources, the old wells and water reservoirs can be restored and new wells constructed. Actual potential for groundwater, however, has not been well studied, and there is no concrete management plan for groundwater. Moreover, the department responsible for water resource in rural areas is transferred to new department, and thus the management system is not well developed. By effectively managing water resource with wells and reservoirs, more water resource will become available for human and livestock uses particularly in the Mangistau rayon.

5) Local roads

The project will develop roads linking major settlements or artery roads to support livelihood for most of the settlements. Roads are classified in Category IV basically in accordance with the Kazakh road standards for small traffic, but roads connecting to small settlements are planned as one-lane roads of Category V. The total length to be covered by the project is estimated to be about 1,045km, of which 625km is classified in Category IV. The Oblast government is expected to take the initiative in implementation and maintenance. The estimated project cost is US$209 million.

6) Village public transportation project

Rural settlements in Mangistau Oblast has problem of transportation. Since there is no public

transportation even to rayon centers, villagers have to organize their own vehicles. In addition, rural industries are not well developed partly due to the lack of transportation. Small-scale household industry can be developed with public freight services. Establishment of bus services can be combined with small-scale freight services by introducing pickup type buses.

Title	**Village poultry production development project**
1. Location	Rural areas in Mangistau Oblast
2. Implementing Agency	Department of Agriculture
3. Objectives	To increase poultry production at rural settlements in Mangistau Oblast
4. Expected Effects	1) Increased income for livestock farmers by poultry production 2) Reduction of the disparity between urban and rural populations
5. Phasing	Phase 1
6. Investment Costs	KZT 30 million
7. Descriptions	
Rural settlements in Mangistau Oblast face a problem of lack of work, opportunity for income generation. Poultry is hardly kept by households in rural area. Poultry can be produced relatively easily with low investment in the villages. In fact poultry production has increased 48% in 2006. In individual farms 10-15 households are organized as one grazing unit. The grazing units can be organized as a production unit. Yurt can be utilized for keeping poultry. <u>Activities</u> - Development of strategy and an implementation plan for poultry production - Organizing technical training for poultry production - Provision of subsidies and low interest credit for poultry production <u>Beneficiaries</u> Peasant farms and individual farms	

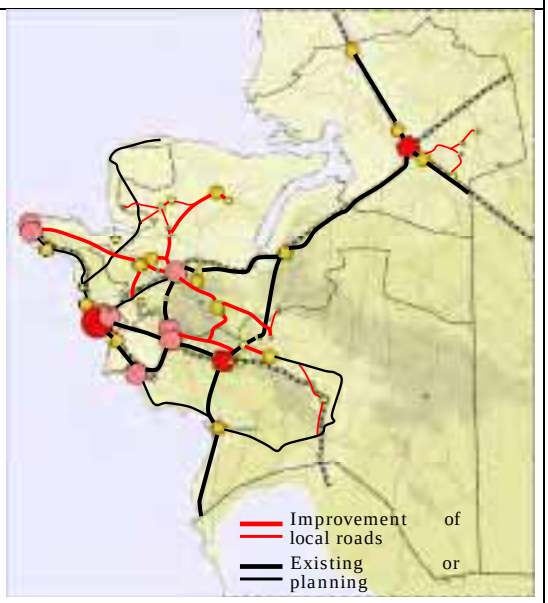
Title	**Groundwater resources management project**
1. Location	Rural areas in Mangistau Oblast
2. Implementing Agency	Department of Communal Service, Department of Agriculture, Department of Natural Resource and Wildlife Management, and Rayon Akimat
3. Objectives	To increase water availability at rural settlements in Mangistau Oblast
4. Expected Effects	1) Improvement on human health by providing water of better quality 2) Increase in livestock production by providing larger amount of water for livestock
5. Phasing	Phase 1-2
6. Investment Costs	KZT 1,500 million
7. Descriptions	
Water shortage is a chronic problem of Mangistau Oblast. A certain amount of underground water resources is available particularly in Mangistau rayon. There are a number of abandoned wells as well as water reservoirs, which were constructed by the Soviet Union. However, some of them are destroyed by deterioration and not restored. In order to secure water resource, the old wells and water reservoir can be restored and new wells can be constructed for human consumption, livestock consumption as well as vegetable/forage production. Currently actual potential for underground water is not well studied and there is no concrete management plan for underground water. In addition department responsible for water resource in rural areas is transferred to new department, thus management system is not well developed at Oblast level. By effectively manage water resources with wells and reservoirs, more water resources become available for human use and livestock in Mangistau rayon.	

Activities
- Conducting a study on potential of underground water in Mangistau oblast
- Formulation of a management plan for underground water resources
- Development of proper institutional mechanism for water resource management
- Restoration of abandoned wells/dykes
- Organizing a water resource committee at each rayon

Beneficiaries
- Rural populations
- Peasant farms, individual farms and agricultural enterprises

Title	**Local roads improvement project**
1. Location	Entire Oblast
2. Implementing Agency	Oblast Transport Department
3. Objectives	1) To ensure access to artery roads for all the settlements in Oblast 2) To solve the problem of isolated settlements
4. Expected Effects	1) Integration of the entire region 2) Reliable road transportation for passengers and freights for all the settlements in Oblast.
5. Phasing	Phase 3
6. Investment Costs	US$209 million
7. Descriptions	

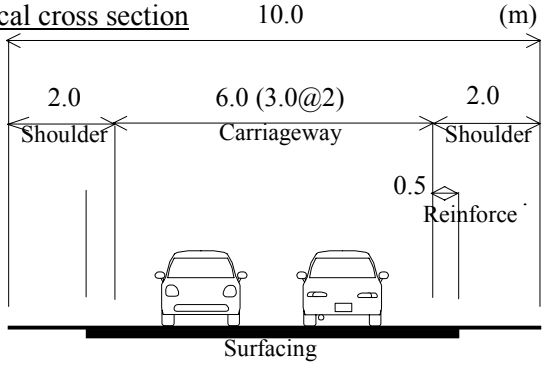
Reliable transportation for passengers and freight will be ensured even in low hierarchy settlements with paved roads linked artery road or major region. Many of target settlements are located in Mangistau rayon and Karakya rayon, where the traffic is small. Therefore, the access roads to settlements with very small population may be developed as a single lane road. The total length of project roads is estimated to be about 1,045km. The completion of local roads will be after 2015, as the road length is much and these developments may start only after the completion of most artery roads with high priority.



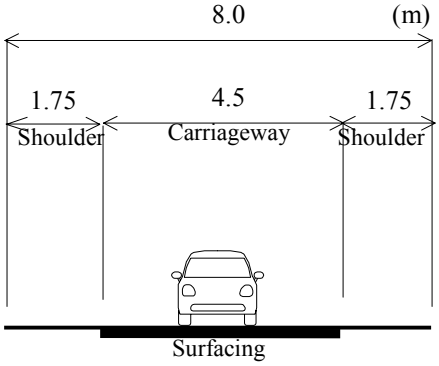
Design traffic volume

The traffic demand is estimated small and roads should be classified under Category-IV according to actual traffic volume in each case.

Typical cross section



2-lane road Category-IV



1-lane road Category-V

Title	**Village public transport project**
1. Location	Rural areas in Mangistau Oblast
2. Implementing Agency	
3. Objectives	To establish rural public transportation between rayon centers and between rayon centers and villages.
4. Expected Effects	1) Enhanced movement of rural populations between villages and rayon centers 2) Increase in distribution of domestic products by public transportation 3) Increase in income for rural populations by developing better market systems 4) Reduction of the disparity between urban and rural populations
5. Phasing	Phase 1
6. Investment Costs	KZT 50 million
7. Descriptions	
Rural settlements in Mangistau oblast has problem of transportation. Since there is no public transportation to rayon center, villagers have to organize their own vehicles. In addition, local manufacturing is not well developed due to the lack of transportation. One of the largest obstacles for small-scale household industry to be developed in rural areas is the cost for transportation. Public freight service can be developed. Establishment of bus service can be combined with small-scale freight service by converting a part of bus to platform. Activities - Development of an implementation plan for public rural transportation networks - Establishment of bus services between rural villages and rayon centers with small-scale freight service	

7) Fishery support sub-program

Background

Fishery in Mangistau Oblast developed rapidly after the World War II centering on Bautino, where workshops for fishing ships and fishing gear, fish processing plant and other related facilities were located. During the peak period, the total fishery production reached 12,000t, and some 2,000 workers were engaged in fishery and fish processing activities. The fish processing plant produced annually some 9,000t of salted dry fish and smoked fish and also 500t of fishmeal from low value fish. There existed also a firm to catch Caspian seals, which produced meat products and processed furs.

The fishery industry in the Oblast declined during the 1990's affected by the economic depression as well as the post-independence turmoil. In particular, the fish processing plant went bankrupt in 1991. The efforts to privatize it failed and the plant was finally closed in 2001 to demolish effectively the Mangistau fishery.

i) Promotion program by the Oblast

The Oblast Akimat decided to revitalize the fishery in Mangistau, and established the Department of Fishery Economy within the Agricultural Department. It formulated the Fishing Industry Development Program in Mangistau Oblast 2006-08. The budget for the program is KZT 4,564 million for 2006-08, supported by the Oblast contribution of 78 million, the Government allocation of 84 million and the rest to be contributed by fishery firms, private investment firms and others.

The program comprises the following measures:

- Promotion of capture fishery by fishing fleet for Sprat and other migratory fish
- Capture of Caspian seals in the northern Caspian Sea during winter by an ice-breaking ship and processing them for meat products, skins, and fertilizer from bones, intestines and other organs
- Construction of fishing ports as bases of fish landing
- Aquaculture for Sturgeon, Pike perch, carp and Salmon by utilizing waste hot water of an open company MAEK Kazatomprom in the sanitary protection zone
- Promotion of fish processing such as fish filleting, vacuum packing and minced fish meat at mini workshops
- Development of sport fishing and marine leisure activities

ii) Recent developments

In response to the promotion program by the Oblast, nature management users having use rights for fishery resources along the Caspian coast and others organized the Mangistau Oblast Balyk Association in June 2006. Some of member fishery and fish marketing firms have started to construct fish landing, transport and processing facilities, and make leasing agreements for small round haul netters and other types of fishing boats.

The recent developments in the fishery industry in Mangistau include the following.

- Six facilities for fish collection, storage and delivery were constructed and are operational in Karakiya rayon and Tupkaragan rayon. Among them are a refrigeration room comprising two facilities and two workshops for fish processing.
- MRK open company is conducting fishing by two leased fishing boats.
- MRK open company has made a purchasing contract for 130t of fish with Caspian Balyk open company in Atyrau oblast and Astrakhkan oblasts (Russian).
- Twelve fish selling shops have been opened, and three more are under construction.
- The negotiation has been made for three fishing vessels equipped with a refrigerator for sprat fishing
- The research information on sturgeon breeding was acquired from the BIOS sturgeon breeding center in Russia to establish a commercial fish breeding farm, and the contract is under negotiation with its center on the breeding-biological study for carp, pike perch and sturgeon.
- The negotiation has been made with a German company EMA for the purchasing of fish processing plant with capacity of 320t.

Issues in fishery development in Mangistau

The main issues in fishery development in Mangistau have been identified as follows:

- Lack of adequate fishery infrastructure such as fish landing, sorting and pre-processing, refrigeration and freezing, and ice making facilities
- Lack of fishing shipbuilding and repair workshops
- Lack of R&D facilities for biological research on fish species, development of fishing gears and fishing methods through testing
- Lack of a single fishery law governing the management and policy making for fishery and related activities as well as fish and marine resources management
- Obstruction of free entry into fishery activities without sub-contracting to nature management users, who are vested with the management rights for fishery resources

- Insufficient system to collect and analyze fishery related data and statistics on fish production, fish sales, fishing fleet, fishermen and others
- Inadequate staff at the newly created Oblast Department for Fish Economy for proper administration of fishery activities

Fish demand and supply prospects

The fish production in Mangistau is minimal at present. Quota for fish catch by species and actual fish production in recent years are summarized in Table 7.27. The quotas were significantly reduced in recent years for all the fish species. In 2008, the total fish quota is set at 13,500t. The fish production as reported may be smaller than actual catch. The total fish production was reported to be 100t in 2005, while the total quota was 235t.

Table 7.27 Quota and Actual Fish Production in Mangistau

(Unit: t)

Species		2003	2004	2005	2006
Herring	Quota	300	30	29.8	200
	Production	8.1	5.4	18.1	-
	%	2.7	18.0	60.7	-
Mullet	Quota	400	400	85.2	400
	Production	77.8	31.6	39.4	-
	%	19.5	7.9	46.2	-
Ordinary fish	Quota	0	700	120	400
	Production	12.5	2.4	42.9	-
	%	0	0.3	35.8	-
Sprat	Quota	6200	6200	0	4000
	Production	0	0	0	-
	%	0	0	0	-
Total quota	Quota	6900	7330	235	5000
Total catch	Production	98.4	39.4	100.4	-

Source: Fishing Industry Development Program Mangistau Oblast for 2006-2008

The population of Sturgeon decreased significantly since the 1960's due to pollution of river and seawaters as well as illegal fishing. Sturgeon is now designated as endangered species, and its fishery is banned in Mangistau. Two hatcheries for Sturgeon exist in Atyrau for breeding and cultivation. As the breeding of Sturgeon requires fresh water, the potential in Mangistau is considered low.

The maximum sustainable fish yield in the Mangistau waters of the Caspian Sea is estimated to be 30,000-50,000t annually. Coastal waters of the Caspian Sea are known for rich plankton of water shrimps (*Amphipoda*) that serve as feed for fish. Under-currents of the sea are reported to be favorable also along the coast. The gulf of Cherkaska off Kuryk is reported to be favorable for natural fish breeding. The coastal areas of the Caspian Sea are considered suitable for brackish water aquaculture as well.

The per capita fish consumption is reported to be 3.5kg according to the official statistics of 2002. The actual consumption is estimated to be 8.6kg according to the household survey as reported by the World Bank. The total fish consumption in Mangistau is thus estimated to be 3,400t. Considering the lack of fish sales outlet in rural areas, the actual consumption may be more like 2,400t. The balance between the fish demand and supply as reported above are met by import from other oblasts and countries. Increase in fish demand in Mangistau would depend on the establishment of marketing channels including sales outlets in rural areas.

Strategy in fishery development

i) Priority in fishery in Mangistau

The fish production in Mangistau is much smaller than the maximum fish yield of the Caspian Sea. Therefore, the highest priority should be given to capture fishery by fishing fleet on the Caspian Sea. The number of fishing boats and fishermen should be much increased by the promotion program. To expand the market and increase the value-added of fishery activities, fish processing should be promoted along with the fishery itself.

Aquaculture can not be implemented in full scale in the near future as the cultivation of Sturgeon for commercial sales takes five to six years, and the selection of proper fish species for aquaculture also takes years. Aquaculture should be started on an experimental basis as it may become significant part of fishery in Mangistau. It would serve as an insurance against possible decline of capture fishery in the future due to over-fishing and/or pollution of seawaters

ii) Capture fishery

Capture fishery may be initiated immediately once basic infrastructure facilities area in place. It would provide promising income sources for rural residents along the coast of Tupkaragan, Mangistau and Karakiya rayons. Institutional measures should be taken to facilitate individual fishermen to enter the fishery industry with or without sub-contracting arrangements with nature management users.

iii) Fishery administration

The newly created Department of Fish Economy is currently staffed only with the Oblast Deputy Akimat and an fishery inspector. This should be much strengthened, including staff in charge of fishery statistics as the base for administering the fishery sector. The R&D functions should also be strengthened in steps, and a fishery experimental station may be established, supported by the Government.

Projects

i) Fishery infrastructure development project

Capture fishery in the Caspian Sea, as the priority for Mangistau fishery, can be initiated immediately once the basic infrastructure is provided. The private sector has already started to construct some facilities as described above. These facilities, if provided by a fishery firm, would be used exclusively by the firm and those fishermen selling their catch to the firm.

The Oblast government may provide guidance and support to the firm so that the facilities may be shared by individual fishermen. One possibility is for the government to introduce a subsidy scheme, by which a portion of investment cost would be borne by the government. Even a relatively small subsidy like 10% of the investment cost would effectively reduce the risk involved and enhance the profitability on the part of the investing firm. This would facilitate the entry of individual fishermen into the fishery industry.

The use of relatively small public fund would be justified as it would induce the development of the fishery industry by independent fishermen. Eligibility of the subsidy is subject to the planning and operation of fishery port and related facilities by private investing firms. In the medium term future, public fishery port facilities may also be

established if the number of independent fishermen increased. Such public port facilities may be accommodate also sport fishing and other marine activities.

ii) Training for shipbuilding and fishing boat workshops

Most popular fishing boats used at present for coastal fishery are small fiber-reinforced-plastic (FRP) boats with outboard engine. Medium size (5-19ton) and larger (over 20ton) FRP boats with inboard engine are not used. The latter are suited to deep sea fishing. Initially, a shipyard for small fishing boats with outboard engine may be constructed with the technology to be introduced from outside. These boats are relatively inexpensive and more easily support coastal residents to enter the fishery industry.

iii) Fishery skill training

A training system should be established urgently for a range of fishery related skills, including ship building and repair, fishing methods and gears, navigational skills, maintenance of freezing equipment, fish processing and others. It is relatively easy to acquire skills for FRP boat building as they are molded. Skills for the repair of outboard engines are also easy to acquire. The training courses can be incorporated into the existing curricula at vocational schools.

iv) Institutional measures

In parallel with the fishery facilities development, institutional measures should be taken by the Oblast government to strengthen the management of fishery resources and fishing activities. The following measures are recommended.

- Strengthening of the Oblast Fishery Department to plan and implement Fishery support measures
- Establishment of credit scheme to support the purchase of fishing boats, gears, refrigerators and other equipment to facilitate the entry of rural residents into the fishery industry
- Improvement of fishery resources management to control illegal fishing activities
- Establishment of fishery experiment station for biological research on fish species, development of fishing methods and gears, fish preservation and processing, etc.

v) Small fishermen support project

Capture fishery by small boat with outboard engine can be operated by a family as a viable economic activity in the waters with rich fish resources. Despite the rich fish resources in Mangistau Oblast, coastal residents have not developed into independent fishermen. A support project is proposed to help the coastal residents to become independent fishermen.

The project would provide training on fishing ship maneuvering, fishing methods, simple fish processing, fish marketing, fishery management and related subjects in order to cultivate fishery as viable rural industry. The training should involve on-the job training on the sea. More successful trainees should be organized for joint procurement of fishing gears, joint marketing of fish and even joint fish processing.

vi) Aquaculture promotion project

Aquaculture will certainly become important part of the Mangistau fishery in the future, and some preparatory works should be included in the fishery sub-program. Aquaculture activities by themselves would be undertaken by the private sector, but the Oblast government should promote the investment in the aquaculture from other regions and countries.

To encourage fishery firms to enter the aquaculture business, the Oblast may support a feasibility study, business plan preparation, and provision of information on aquaculture technology. The aquaculture in Mangistau should target at pike perch, salmon and other high value fish species, while business plan should be carefully prepared and examined for sturgeon and salmon as well in the medium to long term. A pilot project may be implemented by the Oblast initiative to acquire information necessary for full scale development of aquaculture business.

Title	**Fishery training and fishery experimental station construction project**
1. Location	Aktau city
2. Implementing Agency	Fishery section of Oblast Department of Agriculture
3. Objectives	1) To develop and popularize captured fishing technique 2) To develop new fishing and fish processing methods 3) To conduct an ecological study for fish species and marine environment
4. Expected Effects	1) Capture fishing developed by 300 self-employed fishermen 2) Offshore fishing established with improvement of fishing technique 3) Processed fish of high quality and competitiveness 4) Income source of rural peoples generated and their living standard improved 5) Fish resources safeguarded, and the biodiversity ensured through research works
5. Phasing	Phase 1-2
6. Investment Costs	US$1.45 million
7. Descriptions	

At present, the fish catch is extremely small against Maximum Sustainable Fish Yield. There is almost no self employed fisherman and no fishery infrastructure for coastal capture fishing. Measures to revitalize the fishery industry in short and mid terms (2009-2015) are necessary.

To promote the construction of fishery infrastructure and cultivate self-employed fishermen through fishery technical training, a fishery training and research center should be established by the Oblast. The center will play a key role for the future of the fishery industry in the oblast. In the first stage, it will function as the training center to cultivate fishermen. After a certain number of fishermen are cultivated, the function will be shifted to improvement and dissemination of fishing techniques, improvement and development of fish processing techniques, research in fish ecology and marine environment, etc.

The facilities will be constructed for 2009-12, and operated for training and research during 2012-2021. After that, they may be converted into a fishery experimental station. The project costs would total US$1.45 million as detailed below.

Item	Facility/Equipment	US$
Training facilities	Administration building, classrooms, laboratory, lodging, boatshed, boat training facilities	550,000
Training equipment	Fish tanks, fish boxes & cooking tables, refrigerator-freezer、scale, carts, ice-making machine (500kg/day) , FRP boats (6) , outboard engines(10), fishing gears (roll nets, gill nets and etc.) repair equipment for engines, fishing boats, vehicles and etc.)	650,000
Civil works	Slipway, mooring jetty and etc.	250,000
Total		1,450,000

Title	**Hatchery and aquaculture pilot project**
1. Location	Aktau city
2. Implementing Agency	Fishery section of Oblast Department of Agriculture
3. Objectives	1) To establish aquaculture system utilizing discharged thermal seawater by power plant 2) To acquire hatching, cultivation and processing treatment techniques through pilot project implementation 3) To promote fish cultivation
4. Expected Effects	1) Investment to the aquaculture by a private sector promoted 2) Main species in the Caspian Sea preserved through acquisition of hatching technique 3) Employment opportunities expanded and the living standards of people improved
5. Phasing	Phase 1-3
6. Investment Costs	US$5.369 million
7. Descriptions	

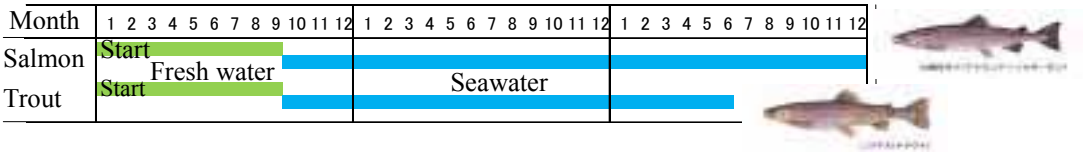
As the sea water temperature of the coastal sea surface in Aktau City becomes 0-6°C in winter season, the chances for marine aquaculture using this seawater here are limited. However, by utilizing heated seawater discharged from the power plant in Aktau City, it will be possible to proceed with fishery aquaculture business.

The seed production and the aquaculture technique have been well established for salmon and trout, which can be easily adapted to local conditions. The facilities of fresh water cycle filtration system for seed production and thermal effluent utilization facilities for adult fish production will be conducted. After the possibility of seed production and aquaculture is demonstrated, the privatization of aquaculture facilities shall be studied to cultivate private aquaculture business.

In view of conservation of natural resources, the seed release of main fishes making their habitat in Caspian Sea in the hatchery will be considered and their seed production will also be studied.

After the feasibility study of hatchery and aquaculture facilities at the first stage (2008-15), hatchery and aquaculture facilities will be constructed. The pilot project for salmon and trout will be executed at the second stage (2016-20). Once the possibility of seed production and aquaculture is demonstrated, the privatization of aquaculture facilities shall be studied for the cultivation of private aquaculture business.

The standard of production schedule is as follows.



The total project cost is estimated to be US$5.396 million as detailed below.

Facilities & Equipment		Expert expenses		Total
Details	Value	Period	Cost	
(1) Hatchery (including superintendent office)	2,960	1 person	245	3,205
1) Hatchery: 800m^2 @ US$1,000/m^2	(800)	24 mos.		
2) Office equipment: telephone, copier, etc.	(30)			
3) Automobile: 4WD x 1	(30)			
4) Closed cycle filtration system: 1 unit	(2,000)			
5) Truck (including seed transport equipment): 8t x 1	(100)			

Facilities & Equipment		Expert expenses		Total
Details	Value	Period	Cost	
(2) Concrete fish pond (excluding conveying pump from thermal power plant)	541	1 person 12 mos.	125	666
1) Circular pond: 5,000m^2 (28 pieces of 15M diameter) @ US$7,000	(196)			
2) Water supply system: Pipe of 350mm diameter, 2 lines x 2km (assumption) @ US$30,000/km	(120)			
3) Warehouse: 250m^2 @ US$700/m^2	(175)			
4) Truck: 4t x 1	(50)			
(3) Processing plant	1,895			1,955
1) Processing plant floor space: 150m^2 @ US$1,000/m^2	(150)	1 person	35	
2) Cold storage facility (30t) & air blast freezer facility (1t/day)	(1,100)	3 mos.	25	
3) Ice making facility (3t/day) & ice storage facility (9t)	(500)			
4) Processing equipment: 1 unit	(100)	1 person		
5) Truck: 2t x 1	(25)	2 mos.		
6) Forklift: 1t x 1	(20)			
Total	5,396		430	5,826

Title	**Fishing technique training program (Fishermen cultivation program)**
1. Location	At fishing training center to be constructed
2. Implementing Agency	Fishery section of Oblast Department of Agriculture
3. Objectives	1) To develop and popularize captured fishing techniques 2) To cultivate 300 self-employed fishermen
4. Expected Effects	1) Capture fishing developed by 300 self-employed fishermen 2) Offshore fishing established by the cultivated fishermen 3) Employment opportunities of rural people and income sources generated 4) Living standards of rural people improved
5. Phasing	Phase 1-3 (for 10 years)
6. Investment Costs	KZT 35.2 million (US$0.293 million)
7. Descriptions	

Practically, no self-employed fisherman exists in Mangistau, and fishing technologies are underdeveloped. It is necessary to take measures to revitalize the fishery industry in short and mid term (2009-2015). A fishery technical training is provided to cultivate self-employed fisherman.

The training will cover how to operate FRP fishing boat, how to catch fish, how to maintain engine in order to cultivate self employed fishermen. The training shall be conducted at the Training and Research Center to be constructed. The fishing training will be provided to 300 people over a 10-year period.

Training subjects and duration:

Training subjects: Fishing gears and methods, quality control, initial fish processing, fish sales, operation of fishing boats, maintenance of outboard engines and fishing boats
Duration of training: April-October (six months for one group of trainees)

It is recommended to invite a chief instructor and a fish-processing instructor with the technical support of fishery-advanced countries. Other instructors can be recruited from local fishermen, fishery related companies, vocational schools and etc. Part of payroll cost for local fishing instructors shall be compensated by the sale of fishery products by the training center. Part of living expenses of trainees shall be also compensated by the fish sales.

The total project cost is estimated to be KZT 35.2 million as detailed below.

(In KZT)

Cost item	1 year	5 years	10 years
Personnel	2,020,000	10,100,000	20,200,000
Training	1,500,000	7,500,000	15,000,000
Total	3,520,000	17,600,000	35,200,000

Title	**Fishery promotion fund establishment**
1. Location	Aktau city
2. Implementing Agency	Fishery section of Oblast Department of Agriculture
3. Objectives	1) To promote the construction of a private fishery base 2) To cultivate self-reliant fishermen
4. Expected Effects	1) Fishing industry developed through the construction of fishery infrastructures 2) Costal and offshore fishing developed through cultivated fishermen 3) Employment opportunities of rural people and income source generated 4) Living standards of rural residents improved through enhanced employment opportunities in the fishing industry
5. Phasing	Phase 1-3 (for 10 years)
6. Investment Costs	KZT 290 million (US$2.4 million)
7. Descriptions	

A fishery promotion fund is to be established for the purpose of the development of fishery industry. The fund will support the provision of subsidy account and the finance with low interests. The fishery subsidy will support part of construction cost of private fish landing bases and part of purchasing capital of fishing boats for fishermen who newly intend to be fishermen. The financial support shall help the material purchasing and the operation fund for fishermen.

Outline of fishery promotion fund and aid system

a) Fishery promotion fund
- Construction of privately owned fish landing bases: The fund will support about 10% of the construction cost
- Purchase of fishing boats and fishing gears: about one fifth of total investment sum shall be supported

b) Fisherman financial aid system
- For fisherman with fishing boats: Purchasing fund of fishing boats and fishing gears with low interests
- Interest rates lower than market interest rates (18-20%) should be applied for the self-employed fisherman
- The total project cost is estimated to be KZT 290 million as detailed below.

Type of subsidy	No. of funds	Fund sum	Total (KZT)
Fund for purchasing fishing boat and gear	300	400,000	120,000,000
Fund for Fishery Infrastructure	20	1,000,000	20,000,000
Reserve fund for fishery materials	300	500,000	150,000,000
Total	620	1,900,000	290,000,000

7.4.2 Social services improvement projects

Projects to improve the social services in Mangistau are proposed in this section for education comprising general education, vocational education and higher education, health care, and support for returnees. For each kind of social services, main issues are outlined and proposed measures are presented.

(1) General education

1) Background

Main issues

General education in Mangistau pursues equal access for all. This is embodied in primary and secondary schools for the mentally and physically disabled, boarding school for orphans, school bus services and boarding schools in remote rural areas, education facilities with sanitarium for children suffering from tuberculosis, and school meal and free stationeries program for disadvantaged children. The Oblast provides personal computers to all general schools, and established an education networking. The entire education program of Mangistau is well organized in line with securing equity in access to general education.

Nevertheless, the general education in Mangistau suffers from inadequate school capacity to meet the increasing population, shortages of teachers, insufficient pre-school education, and degrading school facilities. The recruitment of teachers is particularly difficult in rural areas. Insufficient pre-school education facilities in the Oblast are more concentrated in the Aktau and the Zhanaozen cities.

Ongoing efforts

The double session (2 sifts) system in general school in rural areas does not conform to the education standard of Kazakhstan. However, in Mangistau Oblast, 100 schools are taking double sessions and three schools are taking triple sessions out of 114 schools. According to the information from the Department of Education, the number of seating in short will be 10,272 in 2008 if it is complied with the standard.

The Department of Education has conducted the construction of schools to cover the shortage of schools and seats every year. In the school composition program for 2008-20010, construction and improvement of 29 school are scheduled with the budget for KZT 7,239 million, including the construction of 16 kindergartens, establishment of new general school with 960 seats, increase of classes, construction of boarding schools, etc.. The Department of Education is continuously required to establish more schools due to the high birth rate and constant continuous inflow of the returnees.

2) Proposed measures

Expansion of education facilities

The number of pupils to attend general education schools will reach at least 90,500 by 2015, and at least some 5,000 seats will be additionally necessary even if the double sessions are fully adopted. Munaylinsky rayon should be given priority in expanding the general education facilities. There are about 6,000 pupils in five general schools in the rayon, and one of them is conducting triple session. Moreover, some 12,000 pupils in Munaylinsky go to schools in Aktau City.

Measures to resolve teachers' shortages

Low salary levels and poor living conditions hinder the recruitment and deployment of teachers in rural areas. Additional incentives should be provided to facilitate the increase in teachers at schools in rural areas. One way may be to establish a scholarship system specialized for schools in rural areas, which would be provided to students on the condition that they will work at schools in their home rural areas after graduation. Salary premium is another way to give incentives for teachers to work in rural areas.

Improvement of preschool education

Preschool education at kindergartens for children 3-6 years old is constrained not only by the shortages of facilities but also by the limited financial ability of parents as it costs KZT 6,000 per month to attend kindergarten. Therefore, the mere increased provision of pre-school facilities would not be the solution. It is necessary to strengthen pre-school education in general schools at no fee, and raise awareness among rural parents for the importance of pre-school education. These together would call for the initiative by the Oblast.

(2) Vocational education

1) Main issues

Vocational education in Kazakhstan is provided by primary vocational schools (Lyceum) to educate basic labor techniques, and colleges to educate average techniques for middle class engineers. Primary vocational schools offer training on a wide range of subjects to make students skilled workers with the base for self-independent business. Of the graduates in the 2006 academic year, 79.2% found employment, 10.1% proceeded to higher education, 3.0% went to military services, and 0.7% went abroad. Problems with primary vocational education include relatively high percentage of graduates (7.8% in 2006) who cannot find employment, deterioration of education equipment, and small number of subjects for women.

There are 18 colleges in Mangistau, of which 15 are in the Aktau city, two in Zhanaozen and one in Beineu. The vocational education at colleges covers all the industrial fields with emphasis on the oil and gas industry. Of the graduates from all the colleges, 52.7% found employment, 20.0% proceeded to universities, 3.6% each went overseas and the military. Of the graduates from colleges related to the oil and gas industry, 58% did not find employment as the industry employs dominantly foreign engineers. The quality of engineering education needs to be much improved for oil and gas and their processing industries.

Mangistau Oblast already has sufficient number of vocational schools including six primary vocational schools and 16 colleges. The problem is mismatch between the curricula at these schools and the requirements of the local enterprises as revealed by high levels of out-of-school unemployment rates. This shows also in the fact that about 2,700 workers from other oblasts and foreign engineers are employed by companies in Mangistau.

2) Proposed measures

Curricula improvement program

Training subjects at vocational education institutes should be improved to meet evolving needs of the industries. In addition to quality engineering education for oil and gas industry, training on subjects to support the secondary processing of oil and gas should be strengthened. At present, for instance, the subjects related to chemical products manufacturing have only 2% of al the college

students. Construction industry, currently having only 2% of all the college students is another area that needs strengthening.

As Mangistau pursues the development of logistics industry and tourism and other services development, more human resources need to be trained in related fields. They include international trade, financial services, tourism services, and other high grade office works. Language education should also be geared up for international tourism services, business English, interpreting for conferences and others. ICT related services are other subjects to be strengthened at colleges, including operation and repair of automated control and production devices. In association with these, new types of training and educational equipment need to be introduced at colleges.

Local processing industries should be revitalized as part of the Mangistau regional development. They would offer employment opportunities in rural areas and for women. They include food processing such as dairy products manufacturing, spinning and weaving, and traditional handicrafts. Tourism and other services will also offer a variety of non-engineering employment opportunities such as marketing, accounting, design works, business languages, and management in general. These subjects can be covered mostly at primary vocational schools. The structure of the curricula improvement is illustrated in Figure 7.15.

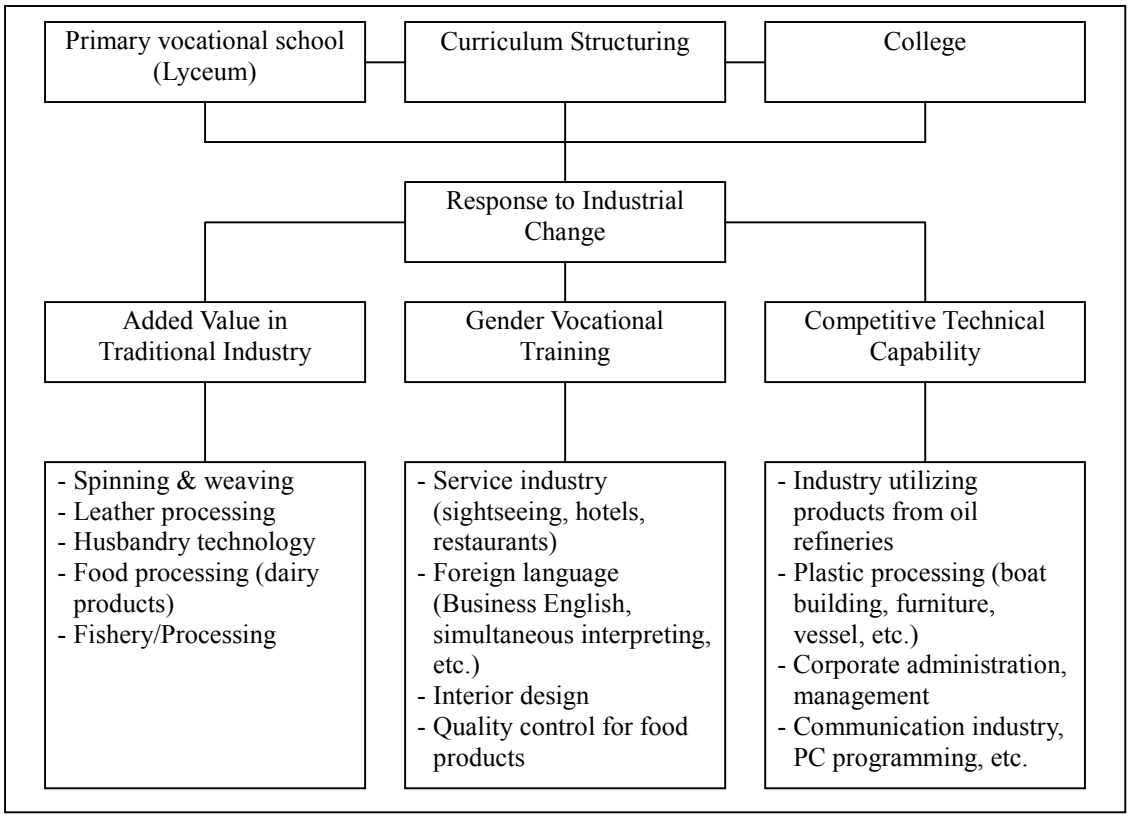


Figure 7.15 Structure of Curricula Improvement for Vocational Education

Medical college strengthening

Medical doctors are insufficient in Mangistau, while medical practitioners except doctors can be cultivated at the existing medical college. In order to secure sufficient number of medical doctors, it is desirable to train them in the Oblast. Two options are either to convert the present state medical college to a medical university or to establish a medical department in the Aktau national

university.

Academic-industrial cooperation program

To resolve the shortages of teachers at vocational education institutes, a system should be established to receive skilled workers and engineers of private enterprises as lecturers. This would provide opportunity to improve the curricula of vocational education to meet the needs of industries. A local school board may be established with teachers, government officials and private sector representatives to discuss and improve the training curricula. Practical training at private enterprises would be part of the improved curricula. Local industries may finance training courses that would benefit them directly or indirectly.

Establishment of human resources development center

As the industrial structure changes in Mangistau, more and more workers will find it difficult to adopt to new requirements by industries. The out-of-school youth, once failed to be employed upon graduation may stay out of jobs. To re-educate and re-train these people, a human resources development center may be established by the Department of Education and the Department of Labor Force and Social Protection. An exploratory committee may be established by these departments to examine the roles and functions of the center and relationships with enterprises.

(3) Higher education

The Aktau State University is the most significant higher education institute in Mangistau, having 450 teaching staff, 5,939 daytime students and 4,699 correspondence students as of December 2007. The school committee of the University has decided to re-organize it into the Caspian State University of Technology and Engineering by the year 2011. The Oblast government has allocated 50ha land for the campus, and the school committee is carrying out a feasibility study and negotiating with the Ministry of Education and other concerned organizations. The number of students will be about 8,000 and education staff some 1,000.

The construction cost is estimated to be US$178 million, of which main education facilities will be implemented with the government budget and service facilities such as a hostel, library and others to be constructed by the private sector. The Caspian State University of Technology and Engineering is expected to become a model partnership project between the University and the industries.

The academic-industrial cooperation mentioned above may extend to cooperative research by the university, industries and the government. Cooperation and joint research with institutes in other countries may also be facilitated through such academic-industrial cooperation. The subjects for joint research would cover not only production technologies but also measures to control environmental pollution and industrial standards.

The correspondence system of study at the Aktau State University should be developed into a full-fledged distant higher education by using ICT technology as the Caspian State University of Technology and Engineering is established. It will expand the access to higher education by rural residents, and allow advanced ICT research and development by the university itself.

(4) Health care

1) Main issues

The performance of health services in Mangistau is considerably lower than the average levels in Kazakhstan as represented by the high infant and maternal mortality rates. Also, the number of

cases of tuberculosis has increased recently, reflecting the need to improve preventive medical care. These problems are more serious in rural areas for a few reasons: more serious shortages of medical doctors, poor living conditions and low income, and low health knowledge and awareness of available medical system.

Popular diseases in Mangistau are attributed to local conditions. They include respiratory diseases caused by air pollution by emission from oil and gas enterprises and by dust, malnutrition and anemia of expectant mothers caused by limited supply of fresh vegetables as well as poor health knowledge, and alcoholism promoted by severe climate.

There are shortages of medical doctors in Mangistau, and over 80% of medical doctors and practitioners are in Aktau and Zhanaozen. The shortages are more serious in rural areas, despite the efforts by the Department of Health to provide additional incentives for doctors working in rural areas such as 25% salary premium and provision of residences. Medical facilities are concentrated in urban areas, and the number of beds is acutely short in rural areas.

Medical equipment is also insufficient including portable X-ray radiography or electron microscope necessary for early detection of infections. No bacteriological laboratory exists at tuberculosis hospital in any rayon, and incubators for prematurely-born babies and periphery devices are inadequate at maternity hospitals. A genetic laboratory started its operation in Aktau City in January 2008, and the inspection system for pregnant women and unborn babies for early detection of congenial defects such as neonatal phenylketonuria is about to be equipped. As the levels of medical facilities and technology, however, are low, disordered pregnant women or patients have to be sent to hospitals in Almaty or Astana.

2) Strategy for health care improvement

Given the main issues outlined above, the shortages of medical doctors and insufficient health facilities should be resolved. This may take time. The initial efforts may be concentrated on the two key issues: improvement of maternal and infant health care and preventive measures for infectious diseases such as tuberculosis. Two programs are recommended corresponding to these issues for implementation by 2015. Through these programs, the total medical care system of the Oblast is improved initially, and further measures can be formulated more effectively.

3) Proposed measures

Rural medical care improvement program

The program is to improve the rural medical care environment and to reduce the infant and maternal mortality rates. The program consists of the following component projects.

i) Cultivation of medical doctors and health personnel

About 250 medical doctors including obstetrician and gynecologist need to be cultivated in the near future. The Oblast budget allows 20 to 30 students to be qualifies for scholarship to study at medical colleges every year. Students from rural areas should be preferentially selected for scholarship to resolve the shortages of medical doctors in rural areas. Also, medical engineers to operate modern medical equipment such as an ultrasonic examination device are cultivated. Laboratory medical technologists and radiological technologists should be trained as well.

ii) Strengthening of maternity hospitals

Maternity and infant health care should be improved by overseas training of medical personnel for prematurely born babies and provision of upgraded equipment. Modern

equipment such as ultra echo medical apparatus for maternity should be allocated to each hospital for checkup of parturient mothers and unborn children. Incubators and resuscitators should also be improved.

iii) Strengthening of health counseling system

Health care extension workers and officers should be cultivated to conduct health counseling and disseminate health knowledge to mothers and rural residents. Extension officers visit rural settlements on a regular basis and train on health care knowledge to residents and conduct the monitoring of residents' health conditions focusing on mothers and children.

Infectious diseases prevention program

The program consists of the following component projects.

i) Strengthening of tuberculosis hospitals

To prevent the spread of tuberculosis is of urgent matter. Each rayon TB hospital should be equipped with a bacteriological laboratory for early identification of viruses and infection prevention.

ii) Establishment of infection prevention system

A system should be established for mandatory health examination for all including Kazakh returnees.

Other measures

A privilege system needs to be introduced for medical doctors working in rural areas. Possible measures to be incorporated in the system include salary premium and rotational dispatch of medical doctors to rural hospitals. The latter dispatch doctors by one year rotation to rural areas suffering from their shortages. Increase in salaries of medical personnel in general should also be studied.

Title	**Medical doctor cultivation project**
1. Location	Aktau city
2. Implementing Agency	Department of Health
3. Objectives	1) To produce a large number of medical doctors 2) To solve shortages of medical doctors especially in rural area
4. Expected Effects	1) Improvement in rural medical environment with much lower mortality of parturient women and infants 2) Improved health care system not only in rural areas but also in urban areas
5. Phasing	Phase 1-3
6. Investment Costs	KZT 525 million (US$4.38 million)
7. Descriptions	
As of 2007, about 270 medical doctors are lacking in Mangistau Oblast. Especially the situation in rural areas is serious, causing poor levels of medical care. The Department of Health commenced in 2007 efforts to cultivate 47 medical students in medical institutes with the budget of Oblast. However, yet about 220 medical doctors are lacking. In order to solve this situation, Oblast should generate additional medical doctors on its own. Students from rural areas should be given priority for scholarships. Medical doctors after passing the qualification exams are to be subject to working in rural areas for a certain period. To be qualified as an MD, six years of study in medial school and one-year internship are required. Therefore, the planned number of medical doctors will be	

generated by the year of 2022, starting the medical doctor cultivation project in 2009.

Total amount of Investment and investment schedule from 2009 to 2021 (KZT 10^6)

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
No. of scholarships	50	50	50	30	30	30	10	0	0	0	0	0	0	250
Cost	15	15	15	6	6	6	3							
		15	15	15	6	6	6	3						
			15	15	15	6	6	6	3					
				15	15	15	6	6	6	3				
					15	15	15	6	6	6	3			
						15	15	15	6	6	3	3		
							15	15	15	6	6	3	3	
By year	15	30	45	51	57	63	66	51	36	21	12	6	3	525

The annual cost necessary for the study by one medical student is estimated to be KZT 300,000. The total cost up to 2021 is KZT 525 million.

Title	**Maternity hospitals strengthening project**
1. Location	Aktau city
2. Implementing Agency	Department of Health
3. Objectives	1) To cultivate medical professionals for premature babies 2) To promote medical skills for total reproductive health 3) To improve medical equipment for reproductive health
4. Expected Effects	1) Reduced maternity and neonatal mortality rates 2) Enhanced skills of reproductive health professionals
5. Phasing	Phase 1
6. Investment Costs	US$0.4 million
7. Descriptions	

A training project in advanced countries for the treatment of premature babies is to be introduced for the cultivation of professional medical doctors and health personnel. The Department of Health has examined pregnant women for early detection of disorders in unborn babies and critical care medicine for premature babies. However, the quality of treatments for premature babies is not up to the standards of the advanced countries. Since January 2008, Kazakhstan has adopted a new standard for critical care medicine of premature babies weighing 500g according to the recommendation of WHO. It is urgent to promote treatment skills and train clinical laboratory technicians to operate modern medical equipment.

The Department of Health recognizes the difficulty in treating 500g premature babies under the existing medical facilities, equipment and skills in Mangistau Oblast as well as the urgency for medical doctors and personnel to improve skills to treat newborn babies weighing 1,000-2,500g. Medical equipment such as incubator and resuscitator are available at hospitals in Aktau and Zhanaozen. However, it is necessary to increase the number of such medical instruments because they are always in use. Also, incubators should be renewed from the old type currently in use. Moreover, incubators, resuscitators and its peripheral devices, all the latest type, must be installed in five rayon hospitals.

The overseas training project for medical doctors and personnel to improve their skills for the treatment of premature babies may be undertaken in 2009-10 in two stages: the first stage for January-April 2009 and the second for January-April, 2010. Ten sets of new incubators and their peripheral devices are to be provided and installed at the five hospitals: six sets to three hospitals in rayons (one set each) and four sets to the two maternity hospitals in Aktau City.

The cost of the overseas training including visa and travel expenses is estimated at US$300,000 in total for two years and that of new equipment US$100,000. The total project cost is therefore US$400,000.

Title	**Tuberculosis hospitals strengthening project**
1. Location	6 rayon hospitals for tuberculosis
2. Implementing Agency	Department of Health
3. Objectives	1) To prevent the spread of tuberculosis 2) To improve of functions of tuberculosis hospitals
4. Expected Effects	1) Much decreased cases of tuberculosis patients in rural areas 2) More productive rural labor force
5. Phasing	Phase 1
6. Investment Costs	KZT 35.2 million (US$0.29 million)
7. Descriptions	

Preventive measures against tuberculosis have been behind in Mangistau Oblast. In 2006, 635 people were newly contacted tuberculosis and 116 patients died. There are 2,273 patients registered in the tuberculosis dispensary of. Aktau City as active tuberculosis patients and the number of patients infected with resistant mycobacterium tuberculosis are increasing.

Some 5,000 returnees have emigrated to Mangistau Oblast on an average in recent years without quarantine inspection. These returnees condition is one of the causes of TB rampancy, and the establishment of early identification of tuberculosis calls for urgent attention.

Although the tuberculosis hospitals are located in Aktau City and five rayons, a bacteriological laboratory is installed only in the tuberculosis dispensary of Aktau City. It is the urgent matter to install a bacteriological laboratory in each rayon tuberculosis hospital for early identification of viruses and the infection prevention.

The project will provide bacteriological laboratories and their peripheral device to rayon hospitals during 2009-11.

The project cost is estimated to be US$283,000. Each rayon TB hospital will receive US$56,600 for a set of equipment consisting of vertival steam sterilizer with a thermostat, 4-nozzle electric furnace with an exhaust probe, automatic bacteriological analyzer, and other related materials.

Title	**Counselor system support program**
1. Location	Mangistau Oblast
2. Implementing Agency	Department of Health
3. Objectives	1) To improve the health and hygiene environments for rural residents 2) To disseminate the health, hygiene and medical knowledge to rural residents
4. Expected Effects	1) Much improved health and hygiene conditions of rural residents 2) Reduced risk of maternity and infant mortality 3) More effective health and medical service policy and system established
5. Phasing	Phase 1-3 (2010-2020)
6. Investment Costs	KZT 108 million
7. Descriptions	

Currently, temporary teams formed by medical doctors and nurses of the Oblast Central Hospital and the Rural Rayon Hospital visit rural settlements irregularly to conduct a health consultation for residents and disseminate of health care information and knowledge. This counseling by visiting, however, is not well functioning as it is operated irregularly and infrequently, and no specialized counselor team is organized.

This project is to establish a team specializing in the counselor patrol and to provide back up supports for the existing counseling system. This counseling team is established by each rayon, and instructed by medical doctor. The actual patrol team, however, is composed only of experienced

nurses who are knowledgeable to health control. This team will be established only for counseling and patrols. Thus, the specialized team can patrol settlements on daily basis and conduct health consultation for residents, monitoring of health conditions of the pregnant women and other residents and disseminate the health, hygiene and medical knowledge. Moreover, the team will be expected to draw up the basic data, through analyzing the health information obtained by patrol, for health and medical improvement in the rural settlements.

The costs of the project are estimated below. The total project cost is KZT 108 million over the 10-year period.

Cost (KZT 1,000)

	Month	Year	5 years	10 years
Expense for wear and tear	50	600	3,000	6,000
Vehicles (6), PC's (6), etc.	-	-	-	102,000
Total				108,000

(5) Support measures for returnees

1) Background

Main issues

According to an Oblast report, the returnees to Mangistau Oblast during January 1992 through January 2006 totaled 19,125 families or 63,823 persons, corresponding to 16% of the Oblast population. Of the total returnees, 56% live in the Aktau city, 25% in Zhanaozen, 13% in Karakiya, 1.9% in the Mangistau rayon, and 0.1% in Tupkaragan. Only about 20% of the returnees are inside the quota and eligible for social supports from the Government such as returning fee, lump sum grant, living expenses upon the number of children, land for residence, support for employment and school, free medical services and others.

Only a few returnees have the qualifications of doctors and skilled workers, and 25% are farmers and 65% have no skills and qualifications. Returnees outside the quota cannot register to the Job Office Department, and take vocational training until they get citizenship or permanent residency.

On-going efforts

The social security system of the Government is applied to returnees who have obtained citizenship. The Oblast government has supported returnees outside the quota such as provision of lump sum grant, rendering jobs and vocational training. More than 40% of the returnees are yet to have residence and live with relatives or friends.

In order to support the returnees, the Management Committee of Migration on Mangistau Area is conducting "the Program of Improvement of Social Position of Oralman in Mangistau for 2006-09". Its main contents are installation of gas pipelines and water supply facilities, construction of access roads, construction of schools, development of residential micro district, and improvement of infrastructure in each returnee settlement. Provision of land for residences and creation of jobs by animal husbandry may also be included. Moreover, the construction of an adaptation center is planned as a temporary facility to receive returnees.

2) Proposed measures

The following measures should be considered to further support the returnees.

Enlargement of quota

The number of returnees will increase as significant economic growth is realized in Mangistau. It would be necessary to enlarge the quota for returnees eligible for the official support by the Government.

Establishment of monitoring or counseling system

To improve support efficiency for increasing returnees, a monitoring or counseling system should be established. Under the Mnagement Committee of Migration on Mangistau Area, a monitoring committee has been established by the Department of Labor Force and Social Protection and each city and rayon, and a follow-up survey should be conducted of their actual life conditions every year 3-5 years after their return. The results should be reflected by the Oblast government in their support program.

Support for citizenship acquisition

The screening process for returnees outside the quota to obtain citizenship should be facilitated to promote the acquisition of citizenship.

Construction of adaptation center

The adaptation center planned by the Oblast government should be realized in the immediate future. The construction cost is estimated to be US$27.5 million.

Provision of complex residence with long-term credit

For those returnees who cannot afford their own residence due to low income, complex residence should be constructed in each settlement and allocated at low cost. Long-term low interest credit should be made available to facilitate the purchase.

Enlargement of employment support and job creation

It is necessary to much enlarge the scope and number of vocational training and job creation as the majority of returnees do not have adequate skills or qualifications.

7.4.3 Urban and rural water supply expansion projects

(1) Projection of water demand

Method

The water demand is calculated as the unit water demand multiplied by the service population. The total water demand may be taken from the consumption record, and the service population may be substituted by the census population. Then the calculated unit water demand reflects unaccounted-for-water consumed by those not registered as formal consumers.

Unit water demand

The government of Mangistau Oblast has not clarified the unit water demand. The Territorial Management of Environmental Protection estimated the water supplied to the Aktau city was 7.52 million m^3 in 2006. If this quantity is divided by the urban population of the city, the unit water consumption is calculated to be 145ℓ/day as shown in Table 7.28. This appears to be likely for domestic water consumption, not including industrial water uses.

The socio-economy of Mangistau Oblast is well established, and the unit water consumption is

expected to stay at a similar level as present. Following the method outlined above, the average unit water consumption in the urban area is set at 230ℓ/capita/day up to 2015 based on the calculation for 2006 in the Aktau city. According to the United Nations Environment Programme (UNEP) report in 1996, the standard unit water supply volume is estimated at 125ℓ/capita/day in villages.

Table 7.28 Unit Average Water Consumption in Aktau in 2006

Item	Unit	Note
A. Consumed water per year for 2006	10^6m^3/year	7.52
B. Population for 2006	1,000 persons	142.1
C. Unit Average Consumption (A/B)	ℓ/capita/day	145

Source: Analysis by JICA Study Team based on the data from Territorial Management of Environmental Protection.

Unaccounted-for-water

A joint stock company (JSC) of the Mangistau Oil Pipeline Management (MNU) Western Branch (WB) studied on KazTransOil about current conditions of Mangistau Oblast water supply by the Volga water. The open company MAEK-Kazatomprom also studied on the loss of seawater during transportation to its networks.

The government of Mangistau Oblast has not clarified the unaccounted for water. The physical loss ratios in Mangistau Oblast water supply systems are expected to be reduced steadily through continued efforts by the respective water supply administrations.

Projected water demand

The unit water demand water is calculated based on the assumptions up to 2015, and the total water demand is projected by applying the unit demand to the projected population for each rayon as shown in Table 7.29.

Table 7.29 Projected Population by Rayon in 2015

Rayon	Aktau	Zhanaozen	Beineu	Karakia	Mangistau	Tupkaragan	Oblast
Population (1,000) in 2006	187.6	79.4	37.1	25.8	28.9	15.6	390.1
Population (1,000) in 2015	244.4	94.9	50.1	31.4	34.5	18.8	503.7
Ratio (%)	48.5	18.8	10.0	6.2	6.9	3.7	100.0

Source: Analysis by JICA Study Team

(2) Water supply plan by water source

1) Caspian Sea water

In planning for water supply expansion, it is important to ensure alternative sources of supply for safety. Although the water supply for Aktau will have to continue relying mainly on desalinization of seawater, the alternative method of membrane should better be introduced in combination with the existing distill plant. At first, reverse osmosis was considered better suited to desalinization of the Caspian Sea water that has lower salinity than the world seawater. However, this system was abandoned because of the low water temperature of the Caspian Sea. The treatment method proposed at present is a low temperature horizontal membranous evaporator system.

Considering the existing conditions of water supply in Aktau, there is no alternative to the use of seawater as a source for the developed desalination plant. This intake quantity is estimated at

25,000-50,000m^3/day. Partial or full replacement of seawater is possible by using groundwater within the period of liquidation resulting from some accidents with spills of mineral oil and seasonal fluctuations of concentration of polluting substances in seawater.

2) Groundwater

At present, groundwater is used for portable water in Mangistau Oblast. The total amount of groundwater extracted in the Oblast was 11.74 million m^3 in 2006. Wastewater from oil operations will be treated increasingly through infiltration into the ground, which will inevitably affect the groundwater regime. Monitoring activities need to be strengthened to ensure the injection of wastewater would not adversely affect the groundwater quality. Another option is to treat the wastewater for discharge into a natural depression to treat it further through infiltration and evaporation. This option, while more expensive, could improve the groundwater regime.

Use of local groundwater for rural water supply may be increased significantly, if some of the wells neglected after the disintegration of the Soviet regime are rehabilitated. For more extensive use of groundwater resources, further exploration of groundwater reserves would be necessary. Based on the existing data obtained from early explorations, more systematic exploration should be undertaken focusing on more promising aquifers. The Territorial Management of Environmental Protection studied the groundwater reserves in Mangistau Oblast. According to the study, fresh drinking quality groundwater (less than 1.5g/dm^3 salinity) is confirmed at 12 locations for the total amount of 66,400m^3/day, and additional 14 sites are found with estimated 24,250m^3/day. Other reserves found are classified as weakly brackish (2.0-3.0g/dm^3), gentry brackish (3.0-5.0g/dm^3), brackish (5.0-10.0g/dm^3), and strongly brackish (10.0-20.0g/dm^3). These could be major alternatives for water supply to the Aktau city.

3) Surface water

The water of the Volga river is transported from Astrahan through a pipeline to Mangistau Oblast and used mainly for drinking water. The total amount supplied in 2006 was 8.74 million m^3. The Volga river water should be more effectively utilized as an important source of drinking water, while there exist uncertainties in continued availability of water right and degrading water quality. Especially in Zhanaozen located in the plateau area, recycling of wastewater should be undertaken by alternative methods. An easy method is to apply the secondary treated sewage to irrigated agriculture directly or through infiltration. Introduction of tertiary treatment and use of treated sewage for industrial purposes is an expensive option that may be justified only if high value-added economic activities are conceived.

(3) Urban water supply expansion projects

As shown in Table 7.29, the service population in Aktau City and Zhanaozen City covered by water supply is 339,300, which corresponds to 67.3% of Oblast population in 2015. It is most important to improve the water supply in these urban areas.

1) Aktau water system expansion

The production is supported by the two desalinization plants existing in Aktau producing 35,000m^3/day and 40,000m^3/day of distilled water. The desalinization at the plants involves a stabilization process on carbonate sand filters, removal of organic substances on filters of birch activated carbon (BAC), demineralization, and fluorination and disinfection for portable water as required by the sanitation standard of Kazakhstan. The projected water demand in 2015 is calculated at 13.38 million m^3/year in Aktau as the unit water demand multiplied by the service

population as shown in Table 7.30.

Table 7.30 Projected Water Demand in Aktau in 2015

Item	Unit	Note
A. Service population for 2015	1,000 persons	244.4
B. Projected unit water consumption	ℓ/capita/day	150
C. Projected water demand (A x B)	$10^6 m^3$/year	13.38

Source: Analysis by JICA Study Team

The water treatment plant (WTP) in Aktau has the treatment capacity of 75,000m^3/day (35,000 plus 40,000m^3/day) or 27.38 million m^3/year. This capacity is sufficient to treat all the projected water demand (22.54 million m^3/year) as confirmed above. However, the base of these facilities was formed in the 1960's and 1970's. As the facilities have been deteriorating, they face problems on decreased production of water. The new WTP, therefore, is required in Aktau to avoid the future water shortage.

The new WTP is proposed as shown in Table 7.31. The treatment method at the existing WTP is evaporation distilled system. The treatment method for new WTP is proposed on low temperature horizontal membranous evaporator system. As the countermeasure against the contamination of intake water of the Caspian Sea, a perforated pipe is laid in the off shore.

Table 7.31 Proposed WTP in Aktau

Item	Unit	Note
Name of WTP	-	-
New/repaired	-	New
Production capacity	m^3/day	24,000
Treated method	-	Low temperature horizontal membranous evaporator system
Budget	KZT 10^6	2,690
Implementing agency	-	MAEK

Source: Analysis by JICA Study Team based on the data from Management of Energy and Municipal Service

2) Zhanaozen water supply improvement

Zhanaozen is dependent on water of the Volga river and groundwater. The production is supported by one WTP existing in Zhanaozen producing 34,560m^3/day of potable water. The projected water demand in 2015 is calculated at 5.20 million m^3/year in Zhanaozen as the unit water demand multiplied by the service population as shown in Table 7.32.

Table 7.32 Projected Water Demand in Zhanaozen in 2015

Item	Unit	Note
A. Service population for 2015	1,000 persons	94.9
B. Projected unit water consumption	ℓ/capita/day	150
C. Projected water demand (A x B)	10^6 m^3/year	5.20

Source: Analysis by JICA Study Team

The WTP in Zhanaozen has the treatment capacity of 34,560m^3/day or 12.61 million m^3/year. This capacity is sufficient to treat all the projected water demand (5.20 million m^3/year) as confirmed above. However, the base of these facilities was formed in the 1960's and 1970's. As the facilities have been deteriorating, they face problems on decreased production water. The new WTP, therefore, is required in Zhanaozen to avoid the future water shortage.

The new WTP is proposed as shown in Table 7.33. The treatment method of existing WTP is

biological filter system. The treatment method for new WTP is proposed on reverse osmosis membrane system.

Table 7.33 Proposed WTP in Zhanaozen

Item	Unit	Note
Name of WTP	-	-
New/repaired	-	New
Production capacity	m^3/day	20,000
Treated method	-	Reverse osmosis membrane system
Budget	KZT 10^6	1,200
Implementing agency	-	Znanaozen city

Source: Analysis by JICA Study Team based on the data from Management of Energy and Municipal Service

(4) Rural water supply expansion project

Most of rural areas are dependent on water of the Volga river and groundwater. These areas face chronic water shortages, contamination of the river water and high salinity of groundwater. The new WTP, therefore, is required as shown in Table 7.34. The treatment method for the new WTP is proposed mainly on distilled system. Some of WTP's will be proposed on low temperature horizontal membrane evaporator system for pilot implementation.

Table 7.34 Proposed WTP in Rural Areas

Item	Unit	Beineu	Karakia	Mangistu	Tupkaragan
Length of the water pipelines	km	33.7	104.9	161.3	38.3
Tank volume	m^3	2,420	13,260	3,450	1,000
Pumping station	No.	3	3	6	2
Numbers of WTP	No.	3	2	2	1
Production capacity	m^3/day	24/24/192	48/156	24/48	1,124
Budget	KZT 10^6	170	150	50	800

Source: Based on The regional program, "Development of rural territories of Mangistau Oblast in 2004-2008"

7.4.4 Wastewater treatment improvement projects

(1) Justification

There are seven wastewater treatment plants (WWTP) in Mangistau Oblast, consisting of four plants operated by private enterprises and three by state enterprises. The treatment method commonly adopted is by biofilm reactors. Cities of Aktau, Zhanaozen and Fort Shevchenko, and the Beineu village are served by sewer systems covering housing and industries. The wastewater treatment plants at Zhanaozen and Beineu are in critical conditions.

According to Table 7.29, service population in Aktau City and Zhanaozen City covered by water supply is 339,300, which corresponds to 67.3% of Oblast population in 2015. Therefore, it is most important to improve the sewerage system in these urban areas and the Beineu village.

(2) Wastewater treatment improvement projects

1) Zhanaozen wastewater treatment improvement

The WWTP in Zhanaozen has the treatment capacity of 4,920m^3/day and is in critical condition.

The projected wastewater in 2015 is calculated at 5.20 million m^3/year in Zhanaozen as shown in Table 7.32. Existing capacity is insufficient to treat all the projected wastewater as confirmed above. The new WWTP, therefore, is required in Zhanaozen to avoid the shortage of future capacity. In particular, the "environmental protection program of Kazakhstan 2008-10" contains the reconstruction and modernization of Zhanaozen WWTP.

The new WWTP is proposed as shown in Table 7.35. The method of existing WWTP is biological filter system. The treatment method for new WWTP is also proposed on biological filter system.

Table 7.35 Proposed WWTP in Zhanaozen

Item	Unit	Note
Name of WWTP	-	KOS
New/repaired	-	New
Treated capacity	m^3/day	21,500
Treatment method	-	Biological filter system
Budget	KZT 10^6	2,039
Implementing agency	-	Ozeninvest (state utility enterprise)

Source: Analysis by JICA Study Team based on the data from Environmental Protection

2) Beineu new wastewater treatment plant construction

The WWTP in Beineu has the treatment capacity of 2,000m^3/day and is in critical condition. The projected water demand in 2015 is calculated at 2.28 million m^3/year in Beineu as the unit water demand multiplied by the service population as shown in Table 7.36.

Table 7.36 Projected Water Demand in Beineu in 2015

Item	Unit	Note
A. Service population for 2015	1,000 persons	50.1
B. Projected unit water consumption	ℓ/capita/day	125
C. Projected water demand (A x B)	10^6m^3/year	2.28

Source: Analysis by JICA Study Team

The projected wastewater in 2015 is calculated at 2.28 million m^3/year in Beineu as shown in Table 7.36. Existing capacity is insufficient to treat all the projected wastewater as confirmed above. The new WWTP, therefore, is required in Beineu to make up with the shortage of future capacity. In particular, the "Environmental Protection Program of Kazakhstan 2008-10" contains the expansion of Beineu WWTP.

The new WWTP is proposed as shown in Table 7.37. The method of existing WWTP is biological filter system. The treatment method for new WWTP is also proposed on biological filter system.

Table 7.37 Proposed WWTP in Beineu

Item	Unit	Note
Name of WWTP	-	KOS
New/repaired	-	New
Treated capacity	m^3/day	15,000
Treatment method	-	Biological filter system
Budget	KZT 10^6	443
Implementing agency	-	Beineu rayon

Source: Analysis by JICA Study Team based on the data from Environmental Protection

3) Aktau treated sewage utilization

The WWTP named KOS-1 in Aktau has the treatment capacity of 72,000m^3/day. This capacity is sufficient to treat all the wastewater generated from the domestic water supplied at 14.60 million

m^3/year or 40,000m^3/day. However, surplus sewage flows into the plant from oil factories, sometimes several times larger than city sewage. Removal of mineral and oil contents by mechanical methods poses problems at other treatment facilities as well.

The projected wastewater in 2015 is calculated at 13.38 million m^3/year in Aktau as shown in Table 7.30. The new WWTP, therefore, is projected in Aktau to make up with the shortage of future capacity. In particular, the "environmental protection program of Kazakhstan 2008-10" contains the construction of Aktau wastewater treatment plant no. 2.

The new WWTP is proposed as shown in Table 7.38. The method of existing WWTP named KOS-1 is biological filter system. The treatment method for new WWTP is also proposed on biological filter system.

Table 7.38 Proposed WWTP in Aktau

Item	Unit	Note
Name of WWTP	-	KOS-2
New/repaired	-	New
Treated capacity	m^3/day	72,600
Treatment method	-	Biological filter system
Budget	KZT 10^6	1,000
Implementing agency	-	TVS&V

Source: ibid.

At present, the treated sewage discharges to the Kshkar-ata pond. However, there is the plan to reclaim the land of Kshkar-ata. This will necessitate the provision of alternative site for the treated sewage disposal. Or otherwise the treated sewage should be utilized for irrigation and other purposes. The quality of the treated sewage should be strictly in compliance with the discharge standards, in particular the nitrogen concentration, salinity, etc.

(3) Institutional measures

In addition to the development/improvement of physical facilities, institutional measures should be taken to realize such water supply and sewerage services that would support the sustainable development of the Mangistau Oblast. These measures are related to the demand side management to suppress the water demand, improvement in the supply capacity, and broader environmental quality improvement.

Institutional links among the organizations

The water resources in Kazakhstan are managed by the Water-Economic Board of the Committee on Water Resources, the Ministry of Agriculture, which establishes policies for water resources development, management, conservation and other related matters. The responsibilities for water supply belong to the Management of Energy and Municipal Services at the national level.

At the regional and local levels, various public entities established in each rayon are responsible under the respective Oblast. An open company named MAEK Kazatomprom is responsible for water production at the sources, and other public entities are in charge of water transfer and wastewater treatment. JSC of MNU WB KazTransOil transfers the Volga river water from Astrakhan in Russia to Mangistau through a pipeline. In Aktau, a state municipal enterprise named TVS&S undertakes thermal water supply and treatment.

In Mangistau Oblast, the water resources, water supply, and sewage are managed by each organization mentioned above. Management of the water resources and water supply and sewerage should be unified to make the maximum use of the limited resources.

The water balance in Mangistau Oblast should be clarified including the unaccounted for water. In accordance with these studies, planning for water facilities is the key issue to be addressed.

The urban water supply system at present covers already part of rural areas, and it is expected to be extended further to cover more in rural areas. As the water supply system for rural areas is improved, an increasing number of sub-systems serving different settlements would be integrated for service efficiency. For better management of the integrated water supply systems, institutional links between urban and rural areas should be strengthened.

The coordination mechanism should be installed between the administrations at different levels to discuss and resolve common issues. As a substantive step toward the integrated management, a common database should be established and the SCADA system installed in the urban area extended to rural areas. Also, a common policy decision-making body should be established to guide and supervise the planning and management activities of the all the related administrations.

Water tariff rationalization

The demand side management of water is increasingly important to realize the water security. The unit water use per capita at present is rather high for the piped water supply in the urban areas facing acute water shortages. The per capita water consumption for domestic use is estimated at 226ℓ/day in the Aktau city, corresponding to upper-middle income households in water rich areas. The tariff variation currently applied to different rayons in Mangistau depending on income levels reflects a sensible policy, but the tariff levels may be slightly raised to suppress the demand. Also, the tariff variation should be effectively utilized to guide the location of economic activities to areas of high development potentials. The sewerage tariff should be introduced in the service area as its system is improved following the ongoing master plan study in Karakia.

7.5 Mangistau Environmental Initiative

7.5.1 Issues for environmental management in Mangistau Oblast

The environmental management in Mangistau Oblast is a matter of survival demanding urgent attention and effective measures against both imminent and long-lasting problems. While the negative environmental heritage from the Soviet era such as the radioactive wastes in the Koshkar-Ata tailing pit and at former nuclear test sites, power plant and uranium processing plant has stared to be managed, there remain inherent environmental problems due primarily to natural conditions of the Oblast aggravated by the economic development and the population growth.

The main issues related to the latter are as follows, and each issue is discussed below.

1) Protection of the water quality of the Caspian Sea to ensure safe and reliable water supply to coastal settlements
2) Provision of adequate water supply for inland settlements
3) Enhancement of land productivity of vast rural areas
4) Reduction of air pollution
5) Prevention of desertification
6) Proper management of solid wastes
7) Biodiversity conservation and protected area management
8) Environmental education and awareness

(1) Protection of water quality of the Caspian Sea

The oil production in the northern Caspian Sea is expected to increase significantly after the

Kashagan oil field becomes operational. The total production including other offshore fields could reach 100 million ton/year. According to the international statistics, up to 0.1% of the total amount of oil produced gets into the seawater. The amount of oil that gets into the northern Caspian Sea may thus be as much as 100,000t/year. To obtain the sea water satisfying the MPC of oil or 0.1ppm for drinking purposes with this amount of oil, the seawater of 1,000 billion ton would be required. This amount corresponds to 1,250 times the current annual intake of the seawater at Aktau.

The offshore oil production of the northern Caspian Sea is considered to be of high risk because of complex geological formation, high oil pressure and shallow water. Therefore, the extraction needs to be undertaken with utmost care. Oil spills from offshore oil production derives from washing of tankers, outflow of floods of oil, and accidents. Preventive measures for accidents such as oil fence, skimmer, collection boats, diffusion materials, absorbing materials, security equipment and spare parts need to be applied to offshore operations. In addition, abandoned wells on the coast and sunken ships should be properly treated.

(2) Water supply for inland settlements

The majority of people in rural areas of Mangistau Oblast rely on groundwater. After the collapse of the Soviet Union, however, many water supply systems based on groundwater have been neglected due to lack of management. Many of them need to be restored to improve the quality of water for rural people and to support economic activities. Participation of local stakeholders and their organizing would hold a key for restoration and sustainable management of the water supply systems.

(3) Enhancement of land productivity

Land productivity in rural areas is constrained not only by water shortages but also by wind erosion. To enhance the land productivity, tree planting and management of grazing land and pastures may be undertaken. The initiative of the Oblast government is indispensable as no immediate benefits are expected from these measures.

(4) Reduction of air pollution

The amount of dust observed in Aktau,, Zhetibai and Zhanaozen exceeds the environmental standards. The air pollution by dust is also a serious problem in rural centers of Shetpe, Kuryk and Beineu. A possible counter-measure is to establish a buffer zone by tree planting around the settlements and excavation sites, taking account of dominant wind directions.

The flare gas utilization program initiated in 2006 to reduce the gas emission seems successful. As the counter-measures taken by enterprises are varies, it is important to share the experiences so that more effective measures can be taken at different oil fields.

(5) Prevention of desertification

The desertification problem in Mangistau Oblast takes a form of the expansion of desert area to rural settlements by sand movement. The causes of the sand movement are considered to be: 1) decline of groundwater tables, 2) reduction of vegetation cover by the use of plants for cooking, and 3) overgrazing near the settlements. The pilot tree plantation experimented for the Senek settlement showed successful results. The selection of tree species is critical for the success, and saxaul is considered worth trying in Mangistau Oblast.

(6) Solid waste management

Oil wastes at oil pits, the central collection point of Uzenmunaigas and the water-oil lake in Uzen are the major problems. The use of oil wastes for road pavement and other purposes is still very limited. The large amount of oil wastes accumulated at public solid disposal sites poses major threat to environment.

The management system for domestic solid wastes has not been well established in Mangistau Oblast. The current problems include: 1) lack of planning for landfill sites, 2) lack of management of landfill operation, 3) no regulations for enterprises' garbage transfer, temporary storage and dumping, 4) no control of unauthorized dumping at landfill sites, and 5) unauthorized dumping outside the landfill sites. Neither waste separation at sources nor recycling has been undertaken in the Oblast. At the bottom of these problems are the lack of awareness for the solid waste management by enterprises and people.

(7) Biodiversity conservation and protected area management

The management of protected areas in Mangistau Oblast is constrained by remote locations of most areas, while the remoteness has helped to preserve these areas. Most reserves other than the Ustyurt state reserve are not managed except occasional visits by FFHC staff. As tourism activities are promoted in these areas, biodiversity conservation and protected area management would become important considerations. The opportunity for integrated management and use for tourism may be presented by the Karakolsky zoological reserve near the Aktau city, where wetlands for migratory birds have been created by the hot water drainage from a desalinization plant.

(8) Environmental education and awareness

Environmental education plays an important role for environmental management in the long run. The Akimat of Mangistau Oblast has been organizing competitions of natural harmony activities among schools and scientific conferences, and publishes environment related magazines. Currently, lectures related to environmental education are taught at schools only on ad hoc basis. A variety of environmental problems existing in Mangistau Oblast as described above present opportunities for environmental education and awareness such as water saving, waste separation and recycling, tree planting, and oil wastes cleaning.

7.5.2 Ongoing initiatives

(1) Institutions for environmental management

The environmental management in Mangistau Oblast is conducted mainly by the Ministry of Environmental Protection (MOEP) of the Government and the Department of Natural Resources and Wildlife Management of the Oblast Akimat. MOEP formulates environmental policies and provides overall environmental administration, while the Akimat department executes the policies at the oblast level. Other government agencies are involved in different aspects of the environmental management such as Kazakhstan Hyrdo-Meteorological Services (KAZHYDROMET), the Ministry of Energy, the Ministry of Ecology and Natural Resources, and the Rural Caspian Water Basin Center.

(2) Environmental plans and programs

Concept of transition to sustainable development and its action plan in 2007-2024

The concept of transition to sustainable development constitutes the background of both Kazakhstan's strategy of sustainable development 2030 and the strategy to join the World's 50 most competitive countries. It specifies the principle, goals, objectives and key mechanism for achieving sustainable development. The concept divides the periods into four phases for the transition: 1) preparation phase (2007-2009) to integrate the principle into all public and political activities for diversification of economy and technological breakthrough; 2) first phase (2010-2012), joining the world's 50 most competitive countries; 3) second phase, (2013-2018) to ensure the Kazakhstan's position in the world development; and 4) third phase (2018-2024) to achieve international standard of sustainable development. The main principles of the concept include: 1) enhancing the resource use efficiency, 2) raising life expectancy with sufficient birth rates, 3) increasing environmental sustainability by ecosystem conservation, clean production with available technologies, and clean-up historical pollutions, and 3) ensuring successful implementation of the policy.

National Action Program on Enhancement of the Environment of the Caspian Sea (2003-2012)

MOEP has formulated the National Action Program on Enhancement of the Environment of the Caspian Sea (2003-2012) within the framework of Caspian Sea Environment Program. The program strategically aims at: 1) complex planning and management of the coastal zone, and 2) control and regulation of pollution and conservation of biological and landscape diversity in the Caspian Sea and the costal zone. The activities to eliminate the historical industrial pollution in the program includes: 1) conservation and elimination of the flooded oil wells, 2) cleaning of the soil by eliminating oil contents, 3) utilization of associated gas from the oil fields, and 4) treatment of hazardous toxic substances at the Koshkar Ata tailing pit.

Environmental program of Mangistau Oblast 2005-07

The main objective of the program is to create ecological equilibrium and favorable environment for the residents in Mangistau Oblast. The program has been carried out by MOEP and the Department of Natural Resource of the Oblast together with other related organizations. The budget for the program is KZT 1.3 billion for the three years. The activities realized in these years cover air pollution, water resources protection, solid waste management, flora and fauna protection, radioactive safety, health care, and environmental education.

7.5.3 Renewed and strengthened initiative

The imminent and long-lasting environmental problems facing Mangistau Oblast call for continued and concerted efforts by the government in cooperation with the private sector and citizens. In the process of overcoming these problems, Mangistau should become the leader in environmental management not only in Kazakhstan but in a much broader geopolitical context. In particular, Mangistau Oblast should become the center of advanced environmental management in the Caspian Sea region. The following projects and program are proposed under the Mangistau environmental initiative.

(1) Caspian seawater monitoring center

Background

The Caspian Sea is the largest enclosed water body in the world, covering 371,000km^2 with a volume of 78,200km^3 and a mean depth of about 170 m. The northern part of the Caspian Sea

covers about 25% of the total surface area, however, the water volume accounts for a mere 0.5% since the average depths of the northern part is less than 5m.

The most serious problem of water contamination of the Caspian Sea is oil input. Of the total oil input to the Caspian Sea, 65% comes from rivers, of which 90% stems from the Volga and the Ural rivers on the northern Caspian Sea. In addition, it is expected that the oil production in the northern Caspian Sea is significantly increased after the production from Kashagan oil field starts. The offshore oil production of the northern Caspian Sea is considered to be of high risk because of complex geological formation, high oil pressure and shallowness of water.

Seawater quality of Mangistau oblast is under significant risk. Increased offshore oil production will multiply the risk of water contamination. Extensive monitoring together with effective actions is needed. Such actions include improvement of sewage treatment at the Volga river, high-tech water treatment at offshore oil fields, emergency actions for oil spill accidents, etc. The management to maintain the Caspian seawater quality needs to be carried out through collaborative efforts by stakeholders in several countries. Considering the amount of drinking water from the Caspian Sea, Aktau is the most vulnerable city against the seawater contamination. Establishment of seawater monitoring center in Aktau to lead international water management activities in the Caspian Region is proposed.

Objectives

The objectives of the project are as follows:

1) To monitor water quality of the Caspian Sea
2) To advocate the monitoring results in domestic and international measures
3) To develop countermeasures to mitigate the contamination with international cooperation

Descriptions

The project would be implemented by the Ministry of Environmental Protection and KAZHYDROMET. The activities included are:

1) Monthly monitoring of seawater quality on the coasts, near oil fields and in the sea,
2) Monitoring by satellite imageries,
3) Investigation of the influence of water contamination on fish,
4) Development of database of the Caspian seawater quality,
5) Emergency operation for oil spills,
6) Publication related to the Caspian seawater quality,
7) Regulatory international conference on the Caspian seawater quality, and
8) Environmental education and development of participatory monitoring systems.

The project should be initiated immediately, following the ongoing initiative by the Oblast government. The project budget may be initially KZT 150 million for 2008-10.

(2) Mangistau protected areas networking

Background

Mangistau Oblast has both precious natural ecosystems and tourism potentials. The Forest and Hunting Committee is responsible for state level protected areas and the Department of Natural Resources is responsible for oblast level protected areas. There exist one state reserve (Ustyurt State reserve), two state zoological preserves (Akutau-Buzachinsky and Karagiye-Karakolsky state zoological reserve, one state reserve zone in Mangistau Oblast. The formulation of a state enterprise is proposed for management of oblast level protected areas. The Department of Natural

Resources proposed several protected areas (Beket Ata, the northeastern part of Buzachi peninsula, western Karatao mountain, coastal areas of Naragan Peninsula) that have high potential for tourism.

Important species include Ustyrt mouflon, Kulan (Equus hemionus: Mongolian Wildass), Saiga antelope (saiga tartarica), and Caracal (Felis caracal: African Lynx). Kulan was once extinct in 1920s from Kazakhstan, but brought from Turkmenistan in order to create a habitat in Kazakhstan. The propagation was first attempted in an island of Aral sea (later became a peninsula due to the reduced size of the lake) then introduced in Aktau-Buzachinsky state zoological preserve. It is known that Saiga used to migrate from the northern part of Mangistau oblast to the north of Uzbekistan.

The problem of protected areas in Mangistau Oblast is the lack of management. Besides the Ustyurt State reserve, monitoring is hardly carried out. Management plans need to be formulated for protected areas network and for each protected areas. Based on the management plans, each protected area should be developed and utilized.

Objective

The objective of the project is to develop a protected areas network and provide sufficient management (monitoring, tourism development, etc.) for each protected area.

Descriptions

The project encompasses the following activities:

1) Formulation of management plans for protected areas network and each protected area
2) Infrastructure development for tourism (access roads, sign posts, tourist information center, etc.) based on the management plans
3) Regular monitoring, database development, and habitat evaluation for endangered species,
4) Tourism development of the protected areas (advertisement, planning with private sectors, etc.)
5) Environmental education at protected areas
6) Organized tours and introduction of commercial activities at the Western Karakao mountains, Beket Ata, etc.

The project would be implemented by the Forest and Hunting Committee, the Department of Natural Resources, and the state enterprise for eco-tourism development. The project budget may be KZT 90 million for 2008-10.

(3) Desertification prevention

Background

In Mangistau Oblast, the expansion of desert to rural settlements by sand movement is a problem. The causes for the sand movement are considered as 1) the decline of water table; 2) the reduction of vegetation cover by using plants for cooking energy; and 3) overgrazing near the settlements. After the collapse of the Soviet Union, animal grazing has become more concentrated near the settlements due to the increased number of individual farms who live in the settlements. In order to prevent the expansion of sand movement, the protected green zone can be established along the settlements.

The pilot tree plantation (e.g. Saxaul (Haloxylon ammodendron), Zhuzgun (Calligonum leucocladum), Teresken (Ceratoides spp.)) to stop sand movement at Senek showed successful results. The animal grazing should be controlled before tree planting start.

Objectives

The objectives of the project are to control the grazing pressure on pasturelands near settlements, and to develop green buffer zones to prevent the expansion of sand movement.

Description

The project has the following components:

1) Development of grazing control measures with individual farms at rural settlements where sand movement is a serious problem
2) Village level nursery production
3) Tree planting for green buffer zones
4) Protection measures against grazing and other potential obstacles against planted trees

The project would be implemented by the Department of Natural Resources, the state enterprise for vegetation cover, and the Ministry of Agriculture. The project budget may be KZT 40 million for the initial implementation in 2008-10.

(4) Oil wastes treatment

Background

A large amount of oil wastes (drilling waste and oil slimes, approximately 1.8 million m^3) are produced in oil production in Mangistau Oblast. Approximately 1.8 million m^3 oil wastes are accumulated in the oil pit of UzenMunaiGas (UMG) and water-oil lake in Uzen. These oil wastes are partly utilized as materials to pave roads in the oil field areas, but the amount are very limited. The oil wastes are owned by oil companies. In order to encourage utilization of oil wastes, a new management system should be established for treatment of oil wastes. The management of the oil wastes can be controlled by a new state enterprise or private company subcontracted by UMG.

Objectives

The objectives of the project are to clean up oil waste accumulated in the oil fields, and to utilize them by economic measures.

Descriptions

The project would be implemented by private and/or state enterprises engaging in solid wastes management as well as oil companies under the guidance and control of the Ministry of Environmental Protection and the Department of Natural Resources. The project covers the following activities:

1) Estimate of amount of oil wastes
2) Establishment of management entity for oil wastes treatment
3) Development of management plan of oil wastes
4) Utilization of oil wastes

(5) Environmental education and awareness program

Background

Environmental education is important for the improvement of environmental management in the long run. The economic growth of Kazakhstan proceeds as oil production increases, but environmental etiquette in citizen has stayed at low level. It is important to realize that as economy grows, energy consumption per capita naturally increases, therefore, the responsibility of

individual for environmental efficiency to consider energy saving and recycling becomes larger. The Akimat of Mangistau Oblast organizes competitions of nature related activities at schools, scientific conferences, as well as publishes environment-related magazines. Currently the lectures related to environmental education at school are carried out on an ad hoc basis. Environmental education can be expanded into regular school programs at primary and secondary educations. An environmental awareness program can be implemented throughout the entire Oblast.

Objective

The program objective is to enhance environmental awareness of the citizens of Mangistau Oblast.

Descriptions

The program encompasses the following activities:

1) Development of an environmental education/awareness program at the Oblast level
2) Environmental campaign at cities/settlements/educational organizations
3) Development of school curricula for school environmental education
4) Implementation of the curricula

The program would be implemented by the Ministry of Education, the Ministry of Environmental Protection, and the Department of Natural Resources in close collaboration with schools, colleges and the university in Mangistau. The program budget may be KZT 3 million initially for 2008-10.

(6) Clean development mechanism application program

Background

The application of clean development mechanism (CDM) would provide opportunities to develop and upgrade industrial production processes in Kazakhstan and Mangistau. Activities of a clean development mechanism are defined by the Kyoto Protocol that prescribes quantified greenhouse gas (GHG) emission reduction targets. The high efficiency gas turbine plant in the Uralsk city of West Kazakhstan was studied by the New Energy and Industrial Technology Development Organization (NEDO) of Japan, and approved as a CDM project activity by the Japanese government in 2002. Mangistau Oblast seems to have high potential for CDM activities.

Unfortunately, the gas turbine plant in Uralsk has not been materialized yet as a joint implementation (JI) project of Kazakhstan and Japan as Kazakhstan is not yet a party country listed in Annex I of the United Nations Framework Convention on Climate Change. In 2006, JI projects from economies in transition saw increasing interest from buyers, and 16.3 million ton of CO_2 equivalent were transacted, increase by 45% from the 2005 level. Of this amount, Russia, Ukraine and Bulgaria provided more than 60% at the average price of US$8.70/t.

Objectives

The objectives of the program are:

1) To contribute to the development and upgrading of industrial production processes,
2) To increase the industrial value-added through carbon dioxide transactions, and
3) To contribute to the establishment of Mangistau's fame as a leader in environmental management.

Descriptions

The program encompasses the following activities:

1) Publicity for CDM activities to industries and citizens to raise their awareness
2) Guidance to enterprises for the formulation of CDM projects
3) Establishment of an institutional mechanism to promote, evaluate and select CDM projects for joint implementation by donor countries
4) Negotiation with supporting countries and partner enterprises for implementing arrangements for CDM projects
5) Implementation of selected CDM projects

The program would be implemented by the Oblast Akimat supported by the Kazakhstan environmental authority in close collaboration with private companies and state enterprises.

(7) Energy-water complex

MAEK-Kazatomprom is the sole producer and supplier of potable, hot and technical water, and electricity to the Aktau city and its surroundings. It supplies also seawater to the city and rayons. Improvement of its supply and safety performance would be of utmost importance for sustainable development of Aktau and Mangistau Oblast as a whole.

MAEK-Kazatomprom once established the first neutron reactor plant of 350MW in 1964. After the independence, the demand for both waster and electricity declined and the safety of the nuclear reactor became a matter of concern. The Government accepted the advice by International Atomic Energy Agency (IAEA) and closed the nuclear plant in 1998. MAEK is now operating with three units of gas-fired thermal power of 1,300MW in total generating capacity and two desalinization plants of 75,000t/day total production capacity.

For their old age, part of the power generating facilities will be renewed in five years. Also, the financial position of MAEK has deteriorated due to high maintenance costs of old facilities and high gas prices. The Ministry of Energy and Mineral Resources is now planning to conduct a feasibility study on nuclear power generation. The introduction of new desalinization facilities is expected in the near future, but both technical and financial options have yet to be clarified.

Under these conditions, a comprehensive feasibility study should be carried out on the improvement of facilities and performance of MAEK. The study should cover not only the proposed nuclear power plant, but also the renovation of the gas-fired power plants possibly with co-generation option, and desalinization plants based on reverse osmosis or other technical options. Intake facilities for safe extraction of the Caspian seawater, even in the event of oil contamination, should be part of the scope of work for the feasibility study.

The feasibility study would be the first step to establish a next generation energy-water complex, which would reconcile the needs to increase stable water and power supply and to ensure the environmental safety at the highest level. The comprehensive feasibility study should be undertaken by the technical cooperation of an advanced country.

The successful establishment of such a complex may represent the embodiment of global warming and civil nuclear agreement between the Governments of Kazakhstan and Japan. This is the challenge that Mangistau Oblast should take if it should become the center of advanced environmental management in the Caspian Sea rim region.

Title	**Caspian seawater environmental monitoring center**
1. Location	Aktau city (main office) and Kuryk and Bautino (satellite offices)
2. Implementing Agency	Ministry of Environmental Protection and Ministry of Energy in cooperation with oil companies
3. Objectives	1) To monitor water quality of the Caspian Sea 2) To reduce amount of oil spills by early detection

	3) To advocate the monitoring results in domestic and international media 4) To develop countermeasures to mitigate the contamination with international cooperation
4. Expected Effects	1) Better maintained water quality of the Caspian Sea 2) Prevention of contamination of fish resources 3) Reduction of health risk of local population from the consumption of contaminated fish 4) Enhanced environmental awareness related to the Caspian seawater quality
5. Phasing	Phases 1-3
6. Investment Costs	KZT 3,000 million
7. Descriptions	

The Caspian Sea is the largest enclosed water body in the world, covering 371,000km^2 with a volume of 78,200km^3 and a mean depth of about 170 m. The northern part of the Caspian Sea covers about 25% of the total surface area, but the water volume accounts for a mere 0.5% since the average depths of the northern part is less than 5m.

The seawater quality of Mangistau Oblast is under significant threat. Increased offshore oil production will multiply the risk of water contamination. Extensive monitoring together with effective actions is needed. Such actions include improvement of sewage treatment at the Volga river, high-tech water treatment at offshore oil fields, emergency actions in case of oil spill accidents, etc. The management to maintain the Caspian seawater quality needs to be carried out through collaborative efforts by stakeholders in several countries. Considering the dependence on drinking water from the Caspian Sea, Aktau is the most vulnerable city against the seawater contamination. Establishment of a seawater monitoring center in Aktau to lead international water management activities in the Caspian region is proposed.

Activities
1) Monthly monitoring of seawater quality on the coasts, near oil fields and in the sea
2) Development of extensive monitoring system by remote sensing
3) Online oil leakage monitoring by wireless monitoring/detection system at oil fields (including fingerprint analysis in case of unknown oil source)
4) Investigation of the influence of water contamination on fish
5) Development of database of the Caspian seawater quality
6) Development of operation system for emergent oil spills
7) Publication/advocate related to the Caspian seawater quality
8) Regulatory international conference on the Caspian seawater quality
9) Environmental education and development of participatory monitoring systems
10) Planning for environmental management in the Volga river basin

Title	**Koshkar Ata tailing pit reclamation project**
1. Location	Koshkar Ata tailing pit
2. Implementing Agency	Ministry of Environmental Protection
3. Objectives	To reclaim the Koshkar Ata tailing pit by covering it with soil, vegetation and concrete
4. Expected Effects	1) Sealing to hazardous substances of the Koshkar Ata tailing pit 2) Creation of safer environment for citizens of Aktau, particularly for Aktau new city
5. Phasing	Phases 1-2
6. Investment Costs	KZT 3,000 million (1,500 mil. in Phase 1 & 1,500 mil. in Phase 2)
7. Descriptions	

The Koshkar Ata tailing pit located 5km away from the Aktau city, 7-8km from the Caspian Sea, was used for disposal of radioactive and industrial wastes for many years. The hazardous industrial substances (mainly calcium phosphate and sulfide iron) were deposited in the pit. Since 1965, approximately 52 million ton of radioactive wastes with 11,000 curies have been disposed in the tailing. The most toxic wastes disposed to the tailing are uranium 238, radium 226 and thorium 230.

To prevent the hazardous substances on the surface of tailing blown to air by winds, approximately 30,000tons/day of r sewage water from the Aktau city are discharged to the tailing. Currently, 70% of the surface of the tailing is covered with calcium phosphate. Other components found in the tailing include iron, sulfur, tin, zinc, cobalt, arsenic, and selenium. Since several substances including uranium are mixed, it is difficult to recover and reuse them.

The project will cover the tailing pit of radioactivity risk with concrete and fence, and rehabilitate vegetation by placing pulps and grass on sites where ground cover is exposed (no water). The project will gradually cover the entire pit. Saxaul will be planted around the tailing pit.

Title	**Abandoned oil wells treatment**
1. Location	Abandoned oil fields near Karajanbas and Kalankas
2. Implementing Agency	Ministry of Environmental Protection, Ministry of Energy in cooperation with oil companies
3. Objectives	To shut down abandoned oil extraction pits near the Caspian Sea
4. Expected Effects	Prevention of oil contamination to the Caspian Sea from abandoned oil wells
5. Phasing	Phases 1-2
6. Investment Costs	KZT 150 million
7. Descriptions	

It was estimated that 170 abandoned oil wells which had produced oil 20-25 years ago are located on the sea coast and potentially covered by the sea water due to the Caspian Sea level rising. In order to prevent the oil spills to the sea, these abandoned wells need to be completely closed.

Oil companies are responsible for closing the oil wells, but the enforcement is not sufficient due to the long history of excavation. There are 23 oil wells in the area under flooding and five wells have been already closed by the Republican budget in the environmental program 2002-2005, but 18 of them have not shut down yet.

Title	**Mangistau protected areas networking**
1. Location	Protected areas in Mangistau Oblast
2. Implementing Agency	Forest and Hunting Committee, Department of Natural Resources and state enterprise for eco-tourism development
3. Objectives	1) To develop a protected areas network 2) To provide sufficient management (monitoring, tourism development, etc.) for each protected area
4. Expected Effects	1) Natural ecosystems of Mangistau oblast maintained 2) Generation of income for rural populations 3) Reduction of social disparity between urban and rural populations
5. Phasing	Phases 1-3
6. Investment Costs	KZT 140 million
7. Descriptions	

Mangistau Oblast has both precious natural ecosystems and tourism potentials. The Forest and Hunting Committee is responsible for state level protected areas and the Department of Natural

Resources is responsible for oblast level protected areas. There exist one state reserve (Ustyurt State reserve), two state zoological preserves (Akutau-Buzachinsky and Karagiye-Karakolsky state zoological reserve), and one state reserve zone in Mangistau Oblast. The formulation of a state enterprise is proposed for the management of oblast level protected areas. The Department of Natural Resources proposed several protected areas (Beket Ata, the northeastern part of Buzachi peninsula, western Karatao mountain, and coastal areas of Naragan Peninsula) that have high potential for tourism.

The problem of protected areas in Mangistau Oblast is the lack of management. Besides the Ustyurt State reserve, monitoring is hardly carried out. Management plans need to be formulated for the protected areas network and for each protected area.

Activities
1) Formulation of management plans for protected areas network and each protected area
2) Infrastructure development for tourism (access roads, sign posts, tourist information center, etc.) based on the management plans
3) Regular monitoring, database development, and habitat evaluation for endangered species,
4) Tourism development of the protected areas (advertisement, planning with private sectors, etc.)
5) Environmental education at protected areas
6) Water sport development at the Karakul state zoological preserve
7) Organized tours and introduction of commercial activities at the western Karakao mountains, Beket Ata, etc.

Title	**Desertification prevention**
1. Location	Settlement areas around the expansion of sand dunes
2. Implementing Agency	Department of Natural Resources, the state enterprise for vegetation cover, the Ministry of Agriculture
3. Objectives	1) To control the grazing pressure on pasturelands near settlements 2) To develop green buffer zones to prevent the expansion of sand movement
4. Expected Effects	Prevention of the expansion of sand movement to the settlements
5. Phasing	Phase 1 (2008-2010)
6. Investment Costs	KZT 140 million
7. Descriptions	

In Mangistau Oblast, the expansion of desert to rural settlements by sand movement is a problem. The causes for the sand movement are considered as 1) the decline of water table; 2) the reduction of vegetation cover by using plants for cooking energy; and 3) overgrazing near the settlements. After the collapse of the Soviet Union, animal grazing has become more concentrated near the settlements due to the increased number of animals owned by individual farms living in the settlements. In order to prevent the expansion of sand movement, the protected green zone can be established along the settlements.

The pilot tree plantation (e.g., Saxaul (Haloxylon ammodendron), Zhuzgun (Calligonum leucocladum), Teresken (Ceratoides spp.)) to stop sand movement at Senek showed successful results. The animal grazing should be controlled before tree planting starts.

The project has the following components:
1) Development of grazing control measures with individual farms at rural settlements where sand movement is a serious problem
2) Village level nursery production
3) Tree planting for green buffer zones
4) Protection measures against grazing and other potential obstacles against planted trees

Title	**Oil wastes treatment**
1. Location	Uzen oil field, Mangistau Oblast
2. Implementing Agency	Ministry of Environmental Protection, Private and/or state enterprises engaging in oil wastes.
3. Objectives	1) To clean up oil wastes accumulated in the oil fields 2) To utilize oil wastes by economic measures
4. Expected Effects	1) Enhanced living conditions of Zhanaozen and Tenge 2) Improved health conditions of the populations living in towns/villages
5. Phasing	Phase 1 (2008-2010)
6. Investment Costs	KZT 50 million
7. Descriptions	
A large amount of oil wastes (drilling waste and oil slimes, approximately 1.8 million m^3) are produced in oil production in Mangistau Oblast. Approximately 1.8 million m^3 oil wastes are accumulated in the oil pit of Uzen Munai Gas (UMG) and water-oil lake in Uzen. Oil wastes in Uzen causes human health problems in Uzen and Zhanauzen; life expectancy of these cities is shorter. Currently the oil wastes from these fields are partly utilized as materials to pave roads in the oil field areas, but the amount is very limited. The oil wastes are owned by oil companies. In order to encourage the utilization of oil wastes, a new management system should be established for treatment of oil wastes. The management of the oil wastes can be controlled by a new state enterprise or private company subcontracted by UMG. The project covers the following activities: 1) Estimate of amount of oil wastes 2) Development of a management plan for oil wastes 3) Establishment of management entity for oil wastes treatment 4) Utilization of oil wastes	

Title	**Environmental education and awareness program**
1.Location	Mangistau Oblast
2. Implementing Agency	Ministry of Education, Ministry of Environmental Protection, and Department of Natural Resources and Wildlife Management in close collaboration with schools, colleges and the university in Mangistau.
3. Objectives	To enhance environmental awareness of the citizens of Mangistau Oblast
4. Expected Effects	1) Enhanced environmental awareness of the population in Mangistau Oblast 2) Clean cities/villages by voluntary activities
5. Phasing	Phases 1-3
6. Investment Costs	KZT 40 million
7. Descriptions	
Environmental education is important for the improvement of environmental management in the long run. The economic growth of Kazakhstan proceeds as oil production increases, but environmental awareness of citizens has stayed at low level. It is important to realize that as economy grows, energy consumption per capita naturally increases, and therefore, the responsibilities of individuals for environmental efficiency to consider energy saving and recycling become larger. The Akimat of Mangistau Oblast organizes competitions of nature related activities at schools, and scientific conferences, as well as publishes environmental related magazines. Currently the lectures related to environmental education at schools are carried out on ad hoc basis. Environmental education can be expanded into regular school programs at primary and secondary schools. The school curricula for school environmental education may have two	

parts: social environment and natural environment. By combining two parts, children will be empowered by environmental awareness. The national concept for the transition to sustainable development, enhancing energy use efficiency and health problems can be taught in the curricula. An environmental awareness program can be implemented throughout the entire Oblast.

The program encompasses the following activities:
1) Development of an environmental education/awareness program at the Oblast level
2) Environmental campaign at cities/settlements/educational organizations
3) Development of school curricula for school environmental education
4) Implementation of the curricula

Title	**Clean development mechanism promotion program**
1. Location	Mangistau Oblast
2. Implementing Agency	Ministry of Environmental Protection in close collaboration with private companies and state enterprises.
3. Objectives	1) To enhance energy efficiency in the industrial production process 2) To reduce use of fossil energy by introducing clean technologies
4. Expected Effects	1) Contribution to the development and upgrading of industrial production processes 2) Acquisition of carbon credits by carbon trade 3) Contribution to the establishment of Mangistau's fame as the leader in environmental management
5. Phasing	Phase 1
6. Investment Costs	KZT 20 million
7. Descriptions	

Global warming is a phenomenon of the global concern. The carbon emission to atmosphere needs to be reduced significantly at global level by collaboration between developed and developing countries. The mechanism of international cooperation for reduction of carbon emission, Clean Development Mechanism (CDM)/Joint Implementation (JI), was defined by the Kyoto Protocol which prescribes GHG emission reduction targets.

In 2006, Joint Implementation projects from the transition countries showed increasing interest from buyers, and 16.3 million ton of CO_2 equivalent were transacted, increase by 45% from the 2005 level. Of this amount, Russia, Ukraine and Bulgaria provided more than 60% at the average price of US$8.70/t.

The CDM/JI projects would provide opportunities for developing and upgrading industrial production processes in Kazakhstan and Mangistau. However, they have not been materialized since Kazakhstan has not yet ratified the Convention on Climate Change. The high efficiency gas turbine plant in the Uralsk city of West Kazakhstan, studied by the New Energy and Industrial Technology Development Organization (NEDO) of Japan, was approved as a CDM project by the Japanese government in 2002.

The program encompasses the following activities:
1) Publicity for CDM activities to industries and citizens to raise their awareness
2) Guidance to enterprises for the formulation of CDM projects
3) Establishment of an institutional mechanism to promote, evaluate and select CDM/JI projects by donor countries
4) Negotiation with supporting countries and partner enterprises for implementing arrangements for CDM projects
5) Implementation of selected CDM/JI projects

7.6 Social and Environmental Considerations

7.6.1 Assessment of possible adverse effects of proposed projects and programs

All the proposed projects and programs constituting the Integrated Regional Development Master Plan for Mangistau Oblast have been assessed at the preliminary level for possible adverse effects. Many of them, in fact, will have positive effects as they have been formulated to attain the economic, social and environmental objectives defined in Section 5.1. Nevertheless, some of them may involve limited negative impacts on social and/or natural environment. The assessment here, as it is preliminary, looks only into possible adverse effects. It would help to formulate mitigation measures in the subsequent stage of project/program development.

The results of the initial environmental examination (IEE) at this stage are summarized in Table 7.39. Possible environmental effects are assessed by project or program into four categories as commonly done for other JICA projects and most other projects: A for serious impact expected; B for some impact expected; C for extent of impact unknown; and D for no impact expected. Only negative impacts are identified, although the proposed projects and programs would involve many and varied positive impacts.

As seen in Table 7.39, the potential negative impacts are assessed as serious (Category A) for the construction of Kuryk port, Sarytash port development, New Aktau city development and Kenderli beach resort complex development. The potential negative impacts are assessed as medium level (Category B) for Aktau port expansion, Bautino port expansion, railway constructions, Aktau airport upgrading, Kenderli airport development, Aktau city urban renewal, and natural gas based development. All other projects are assessed to have only low or nominal impacts.

Table 7.39
Preliminary Assessment of Possible Adverse Effects of Proposed Projects and Programs

No.	Project/program	Status	Ranking
I. Regional Spatial Structure Strengthening Initiative			
1. Artery roads improvement projects			
1.1	Aktau-Beineu road upgrading	On-going	B
1.2	Beineu-Opornoy road upgrading	On-going	B
1.3	Beineu-Uzbekistan border road improvement	Planned	B
1.4	Zhanaozen-Turkmenistan border road improvement	Planned	B
1.5	Zhanaozen-Sayutesroad improvement	Planned	B
1.6	Aktau-Shetpe road improvement	Planned	B
1.7	Kuryk-Kenderli road rehabilitation	Planned	B
2. Railway network development projects			
2.1	Beineu-Shalkar line	Planned	B
2.2	Zhanaozen-Turkmenistan border new line	Planned	B
2.3	Aktau port-SEZ	Planned	D
2.4	Yeralievo station-Kuryk port new line	Planned	B
2.5	Mangistau-Bautino new line	Planned	B
3. Ports and airports development			
3.1	Aktau port expansion	On-going	B
3.2	Kuryk port development	Planned	A
3.3	Bautino port expansion	Planned	B
3.4	Sarytash port development	Planned	A
3.5	Aktau international airport upgrading	On-going	B
3.6	Kenderli airport development	Planned	B
4. Aktau city development projects			
4.1	Urban renewal for micro-districts nos. 1, 2, 3, 3a and 4b	Extended	B
4.2	New Aktau city development	On-going	A

No.	Project/program	Status	Ranking
II. Industrial Cluster Development Initiative			
1. Logistics cluster support program			
1.1	Transport logistic center at the Aktau Port SEZ	Planned	C
1.2	Regional border trade centers near the Aktau Port SEZ	New	C
1.3	Regional truck terminals at the Zhanaozen, Beineu and Shetpe	New	C
2. Linkage industries cluster support program			
2.1	Business Incubation development	New	D
2.2	Enterprise development & support unit establishment	New	D
3. Derivative industries cluster support program			
3.1	Natural gas based development 1 (MMA, Ethanol, and Acetic Acid production)	New	B
4. Tourism cluster support program			
4.1	Kenderli beach resort complex	Planned	A
4.2	Aktau tourist attraction development	New	D
4.3	Zhanaozen-Kenderli circuit road	Extended	C
III. Living Environment Improvement Initiative			
1. Rural livelihood development			
1.1a	Sheep breed improvement program	New	D
1.1b	Milk processing model project by organized farmers	New	C
1.1c	Village wool processing	New	C
1.1d	Technical training for leather production	New	D
1.1e	Local veterinary services development project	New	C
1.1f	Livestock research and extension center	New	D
1.2	Crop production promotion	New	D
1.3a	Fishery training and fishery experimental station	New	D
1.3b	Hatchery and aquaculture construction pilot project	New	D
1.3c	Fishing technique training program	New	D
1.3d	Fishery promotion fund establishment	New	D
1.4	Groundwater resources management	New	C
1.5	Local roads improvement	Extended	B
2. Social services improvement project			
2.1	General education facilities expansion	Extended	D
2.2	Caspian State Univ. of Technology and Engineering	On-going	D
2.3	Medical doctors cultivation	New	D
2.4	Maternity hospitals strengthening	Extended	D
2.5	Tuberculosis hospitals strengthening	Extended	D
2.6	Counselor system support program	Extended	D
3. Urban and rural water supply expansion projects			
3.1	Aktau water treatment plant	Extended	B
3.2	Zhanaozen water treatment plant	Extended	B
3.3	Rural water supply expansion	Extended	B
3.4	Akatu wastewater treatment plant	Extended	B
3.5	Zhanaozen wastewater treatment plant	Extended	B
3.6	Beineu wastewater treatment plant	Extended	B
IV. Mangistau Environmental Initiative			
1	Caspian seawater monitoring center	New	C
2	Mangistau protected areas networking	Extended	C
3	Desertification prevention	Extended	C
4	Oil wastes treatment	New	C
5	Environmental education and awareness program	New	D
6	Clean development mechanism promotion program	New	D

Rating: A: serious impact expected; B: potentially medium negative impact; C: impact unknown; D: no negative impact expected
Note: The rating hereof applies to Tables 7.40-46.
Source: JICA Study Team.

7.6.2 Possible impacts and mitigation measures

For those projects and programs for which possible adverse effects have been identified, more specific impacts are described by project or program. Positive impacts are also described. For negative impacts, mitigation measures are proposed.

(1) Kuryk port development

Possible impacts

The largest environmental impacts are expected by the development of Kuryk port (Table 7.40). The Kuryk port is constructed to ship oil extracted from the Kashagan oil field to Azerbaijan and Iran through the Caspian Sea. The main negative impacts are the risk of deterioration of water quality of the Caspian Sea and topographical and geographical change due to the port construction. Social structure of the society is expected to be changed by a large number of immigrants.

Table 7.40 Scoping for Environmental Impacts by Kuryk Port Development

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	D	
2	Local economy (e.g., employment, livelihood, etc.)	C	Employment opportunities expected
3	Land use and utilization of local resources	C	More intensive land use promoted
4	Social institutions and local decision-making institutions	C	A large number of immigrants expected.
5	Existing social infrastructures and services	C	Much increased traffic expected
6	Poor, indigenous and ethnic people	D	
7	Misdistribution of benefit and damage	C	
8	Cultural heritage	C	
9	Local conflict of interests	C	
10	Water usage/rights and rights of commons	C	Interest group for fishery development founded
11	Sanitation/pubic health conditions	C	
12	Hazards (risk)	B	Fires at oil terminal and stockpiling base
Natural Environment			
13	Topography and geographical features	A	Drastic changes in coastal geographic features
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	C	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	A	Natural geographical features lost
18	Flora, fauna and biodiversity	A	Large impacts on fish and aquatic plants
19	Meteorology	C	
20	Landscape	B	Changes in landscape expected
21	Global warming	C	
Pollution			
22	Air pollution	B	Oil transshipment to tanker
23	Water pollution	B	Oil leaks from tankers and transshipment
24	Soil contamination	C	Oil leaks at oil terminal
25	Wastes	B	Created by construction of oil terminals and tanker routes
26	Noise and vibration	B	Noises and vibrations during construction.
27	Ground subsidence	C	
28	Offensive odor	B	Oil transshipment
29	Bottom sediments	B	Oil spill by tankers
30	Accidents	B	Oil spills by tankers

Source: ibid.

The areas of relevant impacts of the Kuryk port development are summarized as follows.

Component	Construction stage		Operation stage	
	Negative impact	Positive impact	Negative impact	Positive impact
Port development	• Migration of workers • Deterioration of environment related to construction	Creation of employment opportunities	• Deterioration of water quality • Sedimentation • Aquatic flora and fauna • Coastal wetland ecosystem • Change in landscape	• Creation of employment opportunities • Increased visitors • Commercial development
Industrial and logistic development	• Deterioration of environment related to construction • Increased solid wastes by construction	Creation of employment opportunities	• Deterioration of water quality • Terrestrial flora and fauna • Increased solid wastes • Increased demand for portable water and sewage treatment	• Migration of residents and business people • Development of related business
New urban area development	• Increased solid waste by construction • Deterioration of environment related to construction	Creation of employment opportunities	• Deterioration of water quality Terrestrial flora and fauna • Increased demand for portable water and sewage treatment	• Migration of residents • Commercial development • Improvement of local administration • Improvement of social security

Mitigation measures

The largest potential environmental and social threats from the Kuryk port development are oil leaks from tankers/oil terminals and accidents at the oil-stockpiling base. The location of oil stockpiling base should be sufficiently away from urban areas and industrial and logistic development sites. In order to avoid large damages in case of accidents, quick emergency response is required. An emergency operation base should be constructed. A contingency plan for the Kuryk port should be prepared. In order to maintain water quality of the Caspian Sea, KAZYDROMET in cooperation with the Ministry of Environmental Protection should have monitoring points for water quality at and around the Kuryk port. A monitoring center should be constructed.

The population of Kuryk is expected to reach 75,000 at the full development. Although the port development has large capacity, the access to the sea by the local population with proper facilities should also be maintained in order to create comfortable living environment as a medium sized town. Some group is interested in fishery operation in the Kuryk bay. Potential fishery operation by an interest group may be considered in the design of the port.

(2) Sarytash port development

Possible impacts

As the Kuryk port development, the largest potential environmental and social consideration for the Sarytash port development is oil leaks from shipments/oil terminals and oil spills by accidents to the Caspian Sea together with impacts on fauna and flora by topographical and landscape change by the port development (Table 7.41). Since there is no existing residential area neat the port, no impact on local society is expected.

Table 7.41 Scoping for Environmental Impacts by the Sarytash Port Development

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	D	
2	Local economy (e.g., employment, livelihood, etc.)	C	Employment opportunities expected
3	Land use and utilization of local resources	C	
4	Social institutions and local decision-making institutions	C	
5	Existing social infrastructures and services	C	
6	Poor, indigenous and ethnic people	D	
7	Misdistribution of benefit and damage	C	
8	Cultural heritage	C	
9	Local conflict of interests	C	
10	Water usage/rights and rights of commons	C	
11	Sanitation/pubic health conditions	D	
12	Hazards (risk)	B	Fires at oil terminal and stockpiling base
Natural Environment			
13	Topography and geographical features	A	Drastic changes in coastal geographic features
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	C	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	A	Natural geographical features lost
18	Flora, fauna and biodiversity	A	Large impacts on fish and aquatic plants
19	Meteorology	C	
20	Landscape	B	Changes in landscape expected
21	Global warming	C	
Pollution			
22	Air pollution	B	
23	Water pollution	B	Oil leaks from oil transshipping and shipment
24	Soil contamination	C	
25	Wastes	B	Created by constructions of oil terminals and tanker routes
26	Noise and vibration	B	Noises and vibrations during construction
27	Ground subsidence	C	
28	Offensive odor	B	Odor from Oil transshipment
29	Bottom sediments	B	Oil spill by tankers
30	Accidents	B	Oil spills by oil shipping

Source: ibid.

Mitigation measures

In order to minimize damages in case of accidents, an emergency operation base should be established. In order to maintain the water quality of the Caspian Sea, water quality should be regularly monitored.

(3) Kenderli beach resort complex development

Possible impacts

The Kenderli beach resort complex is a large development project with US$6.2 billion investment. The project is expected to start in 2008 and to complete in 2015. The construction of beach resort and new city for employees is the main development. If successfully implemented, a large number of jobs is expected to be generated by the project. The main negative impacts are deterioration of water quality of the Caspian Sea and topographical and landscape changes (Table 7.42).

Table 7.42 Scoping for Kendeli Beach Resort Complex Development

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	D	
2	Local economy (e.g., employment, livelihood, etc.)	C	Employment opportunities expected
3	Land use and utilization of local resources	C	More intensive land use promoted
4	Social institutions and local decision-making institutions	C	Large impacts on local social structure expected.
5	Existing social infrastructures and services	C	Much increased traffic expected
6	Poor, indigenous and ethnic people	D	
7	Misdistribution of benefit and damage	C	
8	Cultural heritage	C	
9	Local conflict of interests	C	
10	Water usage/rights and rights of commons	C	Limited water resources
11	Sanitation/pubic health conditions	C	
12	Hazards (risk)	C	
Natural Environment			
13	Topography and geographical features	A	Drastic changes in coastal geographic features
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	C	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	A	Natural geographical features lost
18	Flora, fauna and biodiversity	B	Large impacts on fish and aquatic plants
19	Meteorology	C	
20	Landscape	B	Changes in landscape expected
21	Global warming	C	
Pollution			
22	Air pollution	B	Dust during construction
23	Water pollution	B	Increase in water pollution by tourism activities and new residents
24	Soil contamination	C	
25	Wastes	B	Created by constructions and increased population
26	Noise and vibration	B	Noises and vibrations during construction.
27	Ground subsidence	C	
28	Offensive odor	C	
29	Bottom sediments	C	
30	Accidents	C	

Source: ibid.

Mitigation measures

The largest potential environmental and social threat of the Kendeli tourism complex development is water contamination of the Caspian Sea. The capacity of wastewater treatment before discharged to the sea should be properly planned based on the amount of water transferred and produced by the installed desalination plants. The amount of fish and the location of Beluga production by aquaculture planned in the middle of the bay should be carefully planned to avoid water contamination.

(3) Other projects having possible adverse impacts

The scoping for other proposed projects assessed as Category B is summarized in Tables 7.43 through 7.46.

Table 7.43 Scoping for Aktau Port Expansion and Bautino Port Expansion

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	D	
2	Local economy (e.g., employment, livelihood, etc.)	C	Employment opportunities expected
3	Land use and utilization of local resources	C	More intensive land use promoted
4	Social institutions and local decision-making institutions	C	Possible increase in immigrants
5	Existing social infrastructures and services	C	Much increased traffic expected
6	Poor, indigenous and ethnic people	D	
7	Misdistribution of benefit and damage	C	
8	Cultural heritage	D	
9	Local conflict of interests	C	
10	Water usage/rights and rights of commons	C	
11	Sanitation/pubic health conditions	C	
12	Hazards (risk)	B	Fires at oil terminal and in shipping
Natural Environment			
13	Topography and geographical features	B	Changes in coastal geographic features
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	C	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	B	Natural geographical features lost
18	Flora, fauna and biodiversity	B	Large impacts on fish and aquatic plants
19	Meteorology	D	
20	Landscape	B	Changes in landscape expected
21	Global warming	C	
Pollution			
22	Air pollution	B	Air pollution related to oil shipping.
23	Water pollution	B	Oil leaks from tankers and shipping
24	Soil contamination	C	
25	Wastes	B	Created by constructions of oil terminals and tanker routes
26	Noise and vibration	B	Noises and vibrations during construction and operation
27	Ground subsidence	C	
28	Offensive odor	B	Odor by oil transshipment
29	Bottom sediments	C	
30	Accidents	B	Oil spills by tankers

Source: ibid.

Mitigation measures

In order to avoid oil spill from the port, alert and emergency operation systems should be established. Water quality should be regularly monitored at the port and water uptake.

Table 7.44 Railway Network Development Projects

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	C	Possible by construction
2	Local economy (e.g., employment, livelihood, etc.)	D	Positive effects expected
3	Land use and utilization of local resources	D	More intensive land use promoted near the new stations
4	Social institutions and local decision-making institutions	C	
5	Existing social infrastructures and services	C	More traffic expected in the villages
6	Poor, indigenous and ethnic people	C	
7	Misdistribution of benefit and damage	C	
8	Cultural heritage	C	
9	Local conflict of interests	C	
10	Water usage/rights and rights of commons	C	Possible new water demand created by increased population near the settlements
11	Sanitation/pubic health conditions	C	
12	Hazards (risk)	C	Accident during construction
Natural Environment			
13	Topography and geographical features	C	Possible changes in natural geographic features
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	C	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	D	
18	Flora, fauna and biodiversity	B	Some impacts on fauna expected
19	Meteorology	C	
20	Landscape	B	
21	Global warming	C	
Pollution			
22	Air pollution	C	
23	Water pollution	B	Increase in water pollution by increased population by new railways
24	Soil contamination	C	
25	Wastes	B	Increase in wastes pollution by increased population by new railways
26	Noise and vibration	B	Noises and vibrations during construction and railway operation
27	Ground subsidence	C	
28	Offensive odor	C	
29	Bottom sediments	D	
30	Accidents	C	

Source: ibid.

Mitigation measures

Migration to the town with new stations should be controlled by proper planning for water capacity.

Table 7.45 Scoping for Aktau City Urban Renewal

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	C	
2	Local economy (e.g., employment, livelihood, etc.)	C	Employment opportunities expected
3	Land use and utilization of local resources	C	More intensive land use promoted
4	Social institutions and local decision-making institutions	C	
5	Existing social infrastructures and services	C	
6	Poor, indigenous and ethnic people	D	
7	Misdistribution of benefit and damage	C	Benefit distributed only in the districts
8	Cultural heritage	D	
9	Local conflict of interests	C	Possible conflicts during construction
10	Water usage/rights and rights of commons	D	
11	Sanitation/pubic health conditions	C	
12	Hazards (risk)	C	Possible accidents during construction
Natural Environment			
13	Topography and geographical features	D	
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	D	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	D	
18	Flora, fauna and biodiversity	D	
19	Meteorology	D	
20	Landscape	C	
21	Global warming	D	
Pollution			
22	Air pollution	C	Dust during construction
23	Water pollution	C	Water pipe replacement during construction
24	Soil contamination	C	
25	Wastes	B	Additional wastes during construction
26	Noise and vibration	B	Noises and vibrations during construction
27	Ground subsidence	D	
28	Offensive odor	D	
29	Bottom sediments	C	
30	Accidents	C	

Source: ibid.

Mitigation measures

The moving of residence either temporal or permanent should be carefully planned in order to avoid unnecessary conflicts. Public finance should be minimized and external private finance with the finance by residents themselves should be encouraged in order to facilitate the expansion to the other area in Aktau.

Table 7.46 Scoping for Natural Gas Based Development

No.	Impacts	Rating	Brief description
Social environment (Impacts on gender and children's rights may be related to all the criteria.)			
1	Involuntary resettlement	C	Potentially involved at construction site.
2	Local economy (e.g., employment, livelihood, etc.)	D	Employment opportunities expected
3	Land use and utilization of local resources	C	Allocation of gas for the project should be ensured.
4	Social institutions and local decision-making institutions	C	
5	Existing social infrastructures and services	C	
6	Poor, indigenous and ethnic people	D	
7	Misdistribution of benefit and damage	C	
8	Cultural heritage	D	
9	Local conflict of interests	C	
10	Water usage/rights and rights of commons	C	
11	Sanitation/pubic health conditions	C	
12	Hazards (risk)	B	Possible accidents (e.g., gas explosion) during operation
Natural Environment			
13	Topography and geographical features	C	
14	Soil erosion	C	
15	Groundwater	C	
16	Hydrological situation	C	
17	Coastal zone (mangroves, coral reefs, tidal flats, etc.)	D	
18	Flora, fauna and biodiversity	D	
19	Meteorology	D	
20	Landscape	D	
21	Global warming	C	
Pollution			
22	Air pollution	B	Treatment for effluent needed
23	Water pollution	B	Treatment for effluent needed
24	Soil contamination	C	
25	Wastes	B	Industrial wastes created
26	Noise and vibration	B	Noises and vibrations in production
27	Ground subsidence	C	
28	Offensive odor	C	Accidental odor by gas leak
29	Bottom sediments	D	
30	Accidents	B	Possible pollution by accident

Source: ibid.

CHAPTER 8 INSTITUTIONAL MEASURES FOR MANGISTAU REGIONAL DEVELOPMENT

8.1 Implementing Arrangements

8.1.1 Public-private partnership for infrastructure

(1) Context of public-private partnership (PPP)

The basic idea of public-private partnership (PPP) is to utilize effectively the capital and expertise of the private sector for the provision of high quality public services at low cost. Various infrastructures represent typical application fields of the public services. PPP is applicable to the whole spectrum of infrastructure provision encompassing planning, design, construction and operation and management. PPP in a narrow sense refers to the outsourcing of operation, maintenance and management of infrastructure facilities to the private sector, but PPP usually is expected to cover financing for infrastructure construction. In Kazakhstan, PPP has been utilized often from the very beginning of planning for such infrastructures as oil pipelines and ports that are considered highly public in nature.

(2) Various forms of PPP

The division of works between the public and the private sectors for infrastructure development varies from the ordinary public works to complete privatization. Variants between these extremes are summarized in Table 8.1. Different forms have been applied in Kazakhstan as outlined below.

For the Aktau port, the Aktau International Sea Commercial Port as an open company operates the port facilities owned by Mangistau Oblast. This arrangement is similar to a case of concession. The same arrangement would be utilized for the planned port expansion. The railway has been operated by KTZ, except the section between Mangishlak and the Aktau port operated by KTS.

Table 8.1 Various Forms of PPP

PPP	Operation & Maintenance	Investment for infrastructure	Market risk	Ownership	Contract period
Public works	Public	Public	Public	Public	-
Consignment	Private / Public	Public	Public	Public	1 year
Management contract	Private	Public	Public	Public	3-5 years
Concessionaire	Private	Private	Private	Public	20-30 years
PFI (BOT, BTO, etc.)	Private	Private	Private	Private > Public	20-30 years
Privatization	Private	Private	Private	Private	-

Source: JICA Study Team

(3) Applicability of PPP to Kazakhstan

In Kazakhstan having the vast national territory, the construction and maintenance of road infrastructure would involve large amount of resources. When the road infrastructure does not

have any revenue base, it can be undertaken only by the public sector. However, it would be effective to delegate part of the management of Republican roads to oblast governments for more efficient management to cover the large territory.

For railways, ports and airports, the demand may be more uncertain especially when the facilities are expanded to meet the rapidly growing demand. In such cases, it is reasonable that the management is undertaken by autonomous corporations owned by the Government, or the facilities are owned by the Government and only the operation is entrusted to such corporations.

For regular maintenance and repair, the services are often entrusted to private firms as is done by AISCP and KTZ. The cleaning services for roads are also commonly entrusted to the private sector.

The main direction for the PPP may be preventive maintenance of infrastructure under a long-term contract. This will allow private entities to take effective measures on their own to attain the specified performance levels as agreed by the long-term contracts. To expand this form of PPP, there should be a large number of capable private firms that can compete in a free environment. SMEs should be supported to develop expertise for operation, maintenance and management of various public services.

Another possible direction for PPP is related to the introduction of a toll road system. This may be introduced for such road sections where certain demand is ensured such as a bypass of a major road or some tourism road. It may be difficult, however, to apply the PPP for the construction. A realistic form may be to establish a road corporation by a joint venture between the oblast government or public investment company and the private firm, whereby the autonomous operation is effected with the toll revenue and the private capital.

(4) Policy measures to promote PPP

To promote active involvement of the private sector in infrastructure development, the following measures should be taken by the Central and oblast governments:

1) Establishment of institutional framework for the private sector investments into infrastructure
2) Realization of proper risk sharing between the public and the private sectors
3) Introduction of various project schemes
4) Provision of enhanced incentives for local infrastructure investments such as preferential treatment for investment tax
5) Provision of information on cases of PPP and their effects
6) Disclosure of management related information and data such as trend and demand for freight
7) Examination of toll road system and pilot implementation

As the first step to promote the infrastructure development by the PPP significantly, guidelines may be prepared by the Central or oblast governments encompassing the above.

8.1.2 Improvement of infrastructure maintenance

The maintenance of infrastructure, particularly important in Kazakhstan with a large territory and harsh climate to ensure its facilities once constructed, would continue to serve the need for a long time. As the stock of infrastructure increases related to the planned regional development of Mangistau, the need for infrastructure maintenance will expand. It is an important consideration that the infrastructure development should be undertaken only to the extent that the resultant maintenance needs can be comfortably satisfied by available human and financial resources.

(1) Capacity development for infrastructure maintenance

The following measures to enhance the capacity of individual experts are recommended for infrastructure maintenance.

1) Application of training and technical support for infrastructure maintenance:
Training courses and technical supports by advanced countries would be effective ways to generate a cadre of qualified experts who would lead the training of increasing number of experts.

2) Education at collage or vocational schools:
General education and specialized courses should be combined to educate students first the importance of maintenance, and train them for maintenance works.

3) Establishment of exclusive section for maintenance:
Within the existing sections for various infrastructures such as roads, railway, ports and airports, an excusive section should be established to take charge of maintenance of respective facilities.

Related to the third point, the exclusive maintenance section should consist of at least two teams: engineering and management. Tasks of these teams are summarized in Table 8.2.

Table 8.2 Terms of Organization for Maintenance Section

Team	Main tasks
Engineering	- Inspection, maintenance and diagnosis of infrastructure - Estimation of infrastructure performance - Data stock of specifications, results of inspection-diagnosis and repair records - Cost estimation/prospect of infrastructure maintenance - Decision on life span, reasons for renewal and infrastructure renewal plan - Simulation to minimize the life cycle cost of infrastructure
Management	- Leveling of annual budget and decision on budget appropriations - Policy decision based on economic analyses and maintenance priority - Mid to long-term maintenance planning - Explanation to stakeholders

Source: Challenge for Introduction of Asset Management System, Civil Engineering Association Japan

The aim of the infrastructure maintenance proposed here is not to maintain the facilities after their performance is reduced but rather to develop a strategic maintenance system to prolong the life of facilities and reduce the life cycle cost through carrying out precautionary maintenance. Therefore, it is not desirable to place the exclusive maintenance section under the existing construction or management section.

The U.S. Federal Highway Agency may provide a good reference for the organization of the maintenance section. It has four teams respectively in charge of system management, construction and preservation, evaluation and economic investment, and life cycle cost of infrastructure (Figure 8.1).

The capacity development for maintenance should be furthered at the institutional level by establishing an infrastructure maintenance system. It aims at the following:

i) Scope, tasks and objects of periodic and routine maintenance works are manualized.
ii) An infrastructure database is established and updated through monitoring to provide accurate and up-to date information on maintenance needs.

iii) Life cycle costs composed of initial and operating costs are examined.
iv) Economic evaluation of maintenance is carried out based on the database and the life cycle costs, and a long-term maintenance plan is prepared.

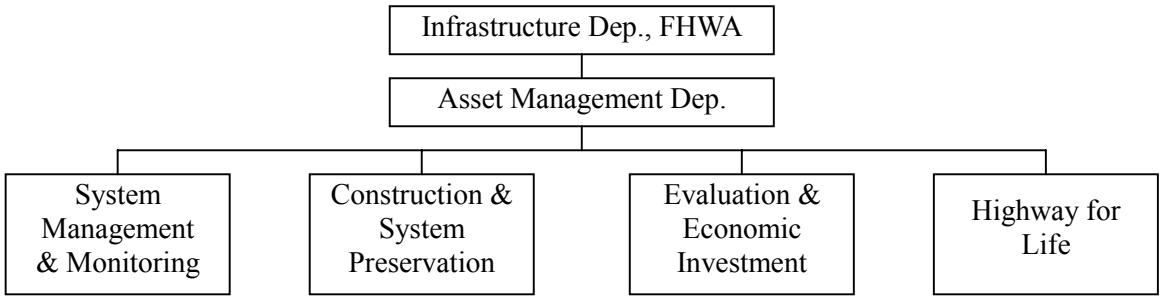


Figure 8.1 Organizational Chart of Federal Highway Agency for Maintenance, USA

The manualization of maintenance works will reduce the labor requirements and cost as no ad hoc decision making will be necessary and work items are clearly defined. Major maintenance works are summarized for each public infrastructure in Table 8.3.

Table 8.3 Major Maintenance Work for Each Public Infrastructure

Infra.	Maintenance work
Road	Repair of pavement and guardrails, surface and ditch cleaning, grass cutting, bridge coating, etc.
Seaport	Repair of piers, berths and loading decks, weeding, green area keeping, etc.
Airport	Repair of runways, taxiways, aprons, lamps, electric power, etc.
Railway	Repair and inspection of rails, locomotives and facilities, etc.
River	Earth and sand removal, grass cutting, repair of protective walls and dams, etc.
Sewerage	Maintenance and inspection of machinery and facilities, etc.
Park	Site cleaning, facilities inspection, grass cutting, plant keeping, etc.
Housing	Repair and maintenance of buildings, garages, etc.

The infrastructure database should contain specifications, quantity, construction year, expected life, current performance, and repair history of facilities. Facilities to be covered for each type of infrastructure are summarized in Table 8.4.

Table 8.4 List of Infrastructure Details for Maintenance Database

Infrastructure	Classification	Facility details
Railway	Track facilities	Tracks
		Platforms
		Safety devices
	Vehicles	Locomotives, passenger cars, wagons
	Incidental building	Station buildings
	Electricity, communications	Electric power, substations
Road	Road surface	Pavements
	Structuring	Bridges
	Incidental facilities	Safety facilities
		Signboards
Seaport	Mooring facilities	Breakwater
		Berths, aprons

Infrastructure	Classification	Facility details
(Seaport)	Freight facilities	Stock yards
		Loading facilities
		Warehouses
	Incidental facilities	Control, office buildings
	Electricity, communications	Electric power, substations
	Others	Customs, machinery, security, etc.
Airport	Runway facilities	Runways
		Taxiways, aprons
	Incidental building	Terminals, control, office buildings
	Electricity, communications	Electric power, substations
		Communication facilities
	Others	Customs, machinery, security, etc.

The first step is to understand the existing conditions, and to plan for periodic and routine maintenance works. Eventually, the entire infrastructure should be managed at the same time. Such an integrated infrastructure management constitutes part of the public asset management system being developed in some developed countries.

(2) Stable fund sources for infrastructure maintenance

A stable and sustainable fund is necessary to carry out periodic and routine maintenance of roads and other infrastructure. As almost every special purpose tax has been abolished in Kazakhstan, the road development maintenance is funded from general expenses. To ensure adequate resources for infrastructure maintenance, the following measures should be examined.

1) Revival of road special fund

Project costs for rehabilitation even of republican roads are largely covered by foreign loan finance in Kazakhstan. A special purpose tax for road development may be revived to ensure stable and sustainable management of the road sector. The application of such fund may not be limited only to road construction and maintenance. Rather, broad range of activities related to the improvement of the transport sector may be subject to the application, including environmental and traffic safety issues.

The revival of such a funding mechanism may be looked at under the new light and in fact may be justified as the integrated multi-modal transport system would contribute to the reduction of greenhouse gases. Mangistau Oblast launching the integrated transport system is in a good position to approach the Central Government for the establishment of the new funding mechanism.

Most roads in Mangistau are managed by local resources, except Republican roads and road sections providing access to the airport and the ports. A special tax may be established by local regulation to finance these local roads. A feasibility study should be undertaken of this scheme.

2) Toll road system

User fees constitute another source of funding for infrastructure. In particular, a toll road system may be established first for such road projects that have superior potential demand. Possible projects include access roads to ports and airports, tourism roads, and bypass or missing link with a tunnel or bridge section. Early and successful implementation would raise the level of public services at less cost to the government.

3) Consignment of periodic maintenance to local firms

Qualified private firms capable of infrastructure maintenance are few due to technical issues involved. This situation tends to make the project costs higher when the qualified firms are selected through public tenders. It is important, therefore, to prepare a manual for regular maintenance, and to commission the maintenance works widely to private firms. A legal framework should be reviewed for public tendering or screening of qualification for tenders for road maintenance works. Such a reform would contribute also to the activation of local economy.

8.2 Measures for Broad Capacity Development for Regional Development

8.2.1 Assessment of existing capacity of Oblast Akimat

The existing capacity of Mangistau Oblast has been assessed based on interviews with directors and deputy directors of the 14 departments and management units of the Mangistau Oblast Akimat. A set of questions were asked about the following aspects:

- Evaluation of directors and deputy directors on the capability level of their staff
- Their views on the need for capacity development
- Problems faced by them with regard to human resources management
- Possible solutions

The major findings are summarized below.

(1) The directors view the capability level of their staff generally highly. Out of 14 directors, those evaluating the capability of staff as "very well" numbered five, whereas those judging "fair" was six. The remaining three evaluated it as somewhere between "very well" and "fair."

(2) They consider all kinds of capability need upgrading, because new things like laws and new methods always come up as summarized below.

Area of capacity development	No. of directors
Information collection capability:	5
Analytical capability:	6
Solution identification capability:	7
Planning capability:	7
Presentation capability:	7
Coordination capability:	5
Financial management capability:	6
Technical capability:	5
Schedule management capability:	6
Monitoring capability:	6
Adjustment capability:	5

(3) Shortages of skilled and qualified experts were mentioned by many directors. This opinion was observed more in the management units concerning infrastructure rather than those responsible for economy and entrepreneurship, and for welfare such as health and education which have long history of high level services from the Soviet era. For example, the number of doctors per 1,000 population in Kazakhstan is 2.0 and 7.3 in rural area and Almaty respectively, whereas those in Japan and USA are 2.0 and 2.3. Traditionally important sections, thus, seem to be budgeted and manned sufficiently compared with infrastructure related sections.

(4) The main reason for the shortages of qualified experts is brain drain. They reported many cases in which young staff that joined the department or management unit quit after working for some years and move to private companies. In one section, there were 50 cases of early resign in three years to move to private companies. This happens because of a large difference in salary levels. It was indicated that while the salary level of the Akimat departments and management units are somewhere between US$100 to 200 per month, that offered by private companies is US$600 or even as high as US$3,000 per month.

(5) Solutions to this problem would be to double the salary or raise it by 30-40% according to them.

(6) Their departments and management units have access to the programs for training their staff provided by the Government and the Oblast Akimat. The following organizations provide training programs:

- Eurasian Training Center of Government Employees of the Public Service Affairs Agency in republic of Kazakhstan
- Academy of Public Administration under the President of the republic of Kazakhstan
- Regional Center of Professional Development of Government Employees

The subjects offered by the third regional center include budget processing, legislation of state organizations, local and general management, personnel management, political technology, standard of state services and simplification of bureaucratic system.

Views toward the training programs offered by these organizations vary from director to director and depending on the area of responsibility of the section. Some point to the lack of subjects relevant to their section or insufficient level of training. Since technical subjects are not offered by these programs, they sometimes do not satisfy government employees with responsibility in technical matters.

(7) There were a number of opinions indicating shortfalls in organizational and institutional aspects such as follows.

- The present tendering system emphasizes too much on “low cost principle”. Consequently, contracts are sometimes awarded to companies with low technical capability, resulting in substandard construction works.

- There is no section in Mangistau Oblast Akimat responsible for transportation planning. The Management Unit of Passenger Transport and Motor Roads is responsible only for maintenance of roads and coordination of passenger transport activities. The Ministry of Transport and Communication is the responsible organization. Lack of planning at the local level sometimes creates mismatches between demand for repair work and actual budgeting.

- Communications between central and oblast organizations for environmental management seem insufficient. The environmental sections at the oblast and the city levels have to carry out their activities on their own without proper guidance by the central organization. Besides, monitoring of the Caspian Sea is undertaken by the Management Unit of Natural Resources and Nature Utilization Regulation only on the basis of local assembly’s decision, a kind of informal arrangement. The environmental management of the Caspian Sea is a more global issue not limited to Mangistau Oblast, requiring more positive engagement of the central ministry.

(8) Although there is positive recognition on the part of the Mangistau Oblast Akimat on the importance of promoting private business activities, it still remains at a conceptual level and has not developed sufficiently into operational level. There is a gap between Akimat officers and private businessmen about the evaluation of business and investment climate in Mangistau Oblast. Investment climate in the Oblast is not as satisfactory as the Akimat officers perceive to the eyes of private people.

8.2.2 Policies and organizations for manpower development

Mangistau Oblast has a high potential for economic growth led by non-energy activities. The energy sector development would create various opportunities for growth of related industries and strengthen financial base of Mangistau Akimat by increased tax revenue. With financial resources and opportunities there, the key for development is the provision of highly skilled labor matched to the demand of those non-energy economic activities. Preliminary observations, however, indicate that there is a vast gap between the demand and the supply of good labor force.

An interview with a private factory operating in Aktau City indicates that human resource is at present a critical constraint for business development in Mangistau. The phenomenon occurring in Mangistau Akimat office is observed also in private companies that qualified labors are mostly recruited by energy sector companies which pay much higher salaries than non-energy sector companies and organizations. The shortage of workforce takes place both for management posts and at workers level. This company had to recruit managers from other provinces where they had previous experience of operation. The workers are sent to other oblasts and foreign countries for training, which is costly. Kinds of skills requiring training are welding, grinding and NDT (non-destructive testing), which are common skills for many industries in Mangistau according to them. There is no skill training programs in these areas available in Mangistau at present.

The Oblast Akimat is well aware of the situation and has stipulated the importance of human resources development matched to demand by the private sector in its Medium-Term Development Plan for 2006-2008 as summarized below. The question now would be to what extent these policies for human resources development has been put into practice and begun to benefit individual private companies.

<u>Primary and intermediate vocational education</u>

a) Target: to develop human resources with modern skill able to respond to technical requirements by the labor market

b) Issues

- To improve and enhance physical environment for vocational education
- To increase financing to support vocational education and training for technical and service jobs
- To train workers and experts with high quality and competitiveness matched to the requirements by the labor market
- To strengthen social cooperation at vocational education institutions including practical application of the skills and strengthening of job placement function
- To introduce a system of evaluation and certificate for skills

c) Specific measures

- To make vocational education compulsory
- To provision teaching materials suited to production process of modern factories
- To improve accounting system

- To promote IT applications

Advanced vocational education

a) Target: Improvement of advanced vocational education system under globalization and market economy circumstance

b) Issues:

- To improve and enhance physical environment for advanced vocational education
- To improve quality of advanced vocational training
- To promote collaboration with private companies, especially those with the most updated technology, for creating opportunities for students to experience on-the-job trainings

c) Specific measures

- Introduction of new subjects, especially practical subjects related with economy
- Implementation of Regional Plan "2006-2008 Training of Workforce" under preparation
- Training of experts matched with demand in the labor market
- Introduction and development of a job placement mechanism for graduates of higher education organizations in cooperation with private companies
- Upgrading of the quality of teaching faculty
- Implementation of collaborative academic research programs
- Prioritization of scientific areas and specialties conducive to regional development
- Development of educational system after higher education level

As part of the government program for human resources development, there is a plan to establish the Caspian State University of Technology and Engineering ("the University" hereafter) as an upgrading of the existing Aktau Government University after S. Esenov. Its outline is presented.

- The university is planned to be opened in the year 2008.
- Its objective is to provide highly qualified specialists familiar with international standards and foreign language and with work experience overseas and with international companies.
- Among a number of principles are combination of "fundamental" and "practical" approaches, emphasis on "how to do" approach, multi-profile training of future specialists, integration of education, science and industry and emphasis on academic flexibility.
- There are going to be 36 disciplines at the bachelor's level, 12 disciplines at the Master of Science level and four disciplines at the Ph.D. level.
- Specialty areas include the following.

  (Technical profile)
  geology and valuable fossil deposits, oilfield, chemical technology of inorganic matter, chemical technology of organic matter, machinery and equipment technology, mechanical engineering, transportation technology, offshore equipment, heat power systems, electrical power systems, ecology and environment, information technology (IT), computers and software, mathematical and computer modeling*, instrumentation and controls, construction, safety and environment, standardization, meteorology and certification, material science and technology of materials*, production of construction materials and structures*

(Non-science/social profile)
International diplomatic affairs, linguistics, law, law enforcement activities, economics, management, accounting and auditing, finance, government and administration, marketing, logistics and transportation, land development and land registry, customs, archaeology and ethnology*, social services*, tourism*

(Educational profile)
Pedagogy and methods of primary education, pedagogy and psychology, mathematics, sports, physics, IT, chemistry, biology, history, land and economics, geography, Kazakh language and literature, Russian language and literature, two foreign language, music*,

*Subjects to be newly taught at the university.

- The number of professors and students are planned to be 1,000 and 8,000 respectively.
- A land parcel with an area of 32ha is allocated in the micro region 32 of Aktau City. The construction works starts in 2007 and is scheduled to finish in 2011. The total construction cost is estimated at 21.4 billion tenge, broken down into 9.8 billion tenge for buildings, 4.9 billion tenge for laboratories, parks, furniture and equipment and 6.7 billion tenge for housing on mortgage and territory development.

Table 8.5 presents the existing vocational training centers, vocational schools and colleges, both state and non-state.

8.2.3 Public-private cooperation

Promotion of cooperation among private companies would be an important element of organizational capacity development for Mangistau Oblast. The ultimate goal would be for the private sector and the Akimat office to regard each other as partners, exchange freely the views from respective perspective and moves forward hand in hand to achieve regional development goals. For this kind of mechanism to function, private companies should have some kind of body to represent them. This body could function as the channel of communications with the Akimat office, integrating the voices from private companies, presenting them to the Akimat office and also transmitting the messages from the Akimat office to private companies.

This kind of mechanism is already functioning at the national level with two organizations identified as representing private sector: Foreign Investors' Council (FIC) and the Forum of Entrepreneurs of Kazakhstan (FEK). FIS was established in 1998 to ensure direct dialogue between investors and the government. FIC is chaired by President of Kazakhstan. It holds meetings once or twice a year. Senior management of the international financial organizations and foreign companies represent the private sector. FIC has been instrumental in solving problems and improving business environment, tackling various problems in judicial, legislative, taxation, procedural, labor, educational and environmental aspects.

FEK is oriented more toward domestic medium and small-scale entrepreneurs. Its mission is defined as contributing to creation of a favorable economic climate in which small and medium size businesses in Kazakhstan are able to create jobs and operate profitably. Its tasks include facilitation in the creation of business associations and strengthening their mutual cooperation, creation and development of opportunities for dialogue between business associations and the government at all levels and implementation of awareness programs by forums, public hearings etc. FEK supported establishment of business associations in 12 oblasts in Kazakhstan, but not yet in Aktau.

Table 8.5 Existing Vocational Training Centers, Vocational Schools and Colleges

Category	Name of School
Vocational training center	1. KADO – EDUCATION Ltd. - types of activity: training, retraining and improvement of professional skills by directions: • Operation, maintenance service and repair of sea techniques • Specialties of machine industry • Construction specialties • Working specialties for foundry manufacture • Roads construction • Welding manufacture • Electric mounting works 2. CTR PROJEKCTS Ltd - a professional training for construction industry 3. Caspian Technical Resource Ltd - a professional training for construction industry, servicing of pipelines 4. Corporate Educational Center Ltd of "Kazmunaigaz" JSC, Aktau city 5. Aktau Training Center, which will be opened after repair works completion in January, 2008. Its educational center has been established under support of « Nursultan Nazarbaev's Fund" Public Foundation and RKK Norway Foundation (comprising resources of 32 colleges in Rogaland district) for training, retraining and professional skills improvement of personnel and experts for oil-and-gas industry in accordance with international requirements.
Vocational school	Professional Lyceum No. 1, Aktau city Vocational School No. 3, Zhanaozen city Vocational School No. 5, Shetpe village in Mangistau rayon Beineu Casiptik Mektebi, Beineu village in Beineu rayon Karakiya Vocational School, Zhetybai village in Karakiya rayon Vocational School No. 018, Aktau city
State college	Mangistau Humanitarian College, Aktau city Mangistau College of Arts, Aktau city Mangistau Polytechnic College, Aktau city Mangistau Energy College, Aktau city Zhanaozen Oil and Gas College Named after O. Turmaganbetuly, Zhanaozen city Beineu Humanitarian-Economic College, Beineu village in Beineu rayon Mangistau College Affiliate, Bautino village in Tupkaragan rayon Mangistau Oblast Medical College, Zhanaozen city College of Aktau State University Named after S. Esenova, Aktau city College under Naval Institute, Aktau city
Non-state college	Meirbike Medical college, Aktau city Kainar College, Aktau city College of Foreign Languages, Aktau city College of "Bolashak" Kazakhstan Modern Academy, Aktau city Aktau Registration-Technological College, Aktau city Lingva College of Foreign Languages, Zhanaozen city Zhanaozen Polytechnical College, Zhanaozen city Aktau College Affiliate of Academy of Transport and Communications JSC Named after M. Tynyshbaev, Aktau city

In Mangistau Oblast, the Council of the Mangistau Union of Entrepreneurs (Atameken) functions as an umbrella organization representing entrepreneurs in the oblast. Atameken was established in 2005. Most of its members are medium size companies with employees of 10 to 1,000. It is an organization independent from national Atameken, central government and local government. They generally maintain good relation with the Department of Entrepreneurs. There is an opportunity called "Council of Entrepreneurs" taking place every three months where they can exchange information and opinions with Akim. Their expectation to the Akimat office is for it to function as "soil where grass grows rather than asphalt." Mangistau Chamber of Commerce was established 40 years ago, but not seems to be functioning as the representative body of the companies in Mangistau.

8.2.4 Recommendation for capacity development

(1) Recommendation for capacity development of Oblast Akimat

The capacity development of the Oblast Akimat should be promoted to contribute to the national policy of decentralization, and to realize more efficient and appropriate planning and development responding to local needs. In particular, the planning capacity of the Oblast officers should be enhanced in two broad areas: integrated planning and specific infrastructure planning. In the integrated planning area, three training subjects are proposed: project cycle management (PCM), integrated regional development master planning (IRDMP), and environmental management.

PCM is a tool for managing the whole cycle of a project starting from identification of stakeholders, clarification of problems and their interrelations, especially cause and effect relations, preparation of logical framework, monitoring methodology and evaluation techniques. PCM would enhance the capacity of individual officers and organization as a whole in addressing the most important issues effectively and efficiently through prioritization of problems, identification of most urgent actions and sharing of common understanding among officers toward project objective and scope and provision of a set of criteria that would ensure consistent monitoring and fair and objective evaluation.

Whereas PCM is a useful tool for problem-solving approach, the IRDMP approach is oriented more toward development of potentials endowed in a region. The present study is the very effort to prepare an integrated regional development master plan for Mangistau Oblast. A comprehensive approach of IRDPM encompassing all the sectors related with development in a region would create synergy effect of different sectors combined, thus resulting in more robust development than sector-focused approach. Officers and sections with different responsibilities would be able to share a common view toward the direction of development in the future and position activities of each officer and section in the overall context.

PCM and IRDMP are mutually complementary. In the stage after the present study is completed, the proposed programs and projects could be reviewed applying PCM method and promoted to implementation. The IRDMP will need to be constantly reviewed and whenever conditions change it should be modified. For these activities to take place, training of Akimat officers in these two subjects would be required.

The environmental monitoring should be undertaken with the wide participation of stakeholders under the management of the Oblast. The capacity to guide the procedures of participatory monitoring and evaluation needs to be enhanced at the Oblast, including environmental impact assessment.

In the infrastructure planning area, training subjects should cover: 1) urban planning, 2) land use planning, 3) transportation, 4) water resources and water supply, 5) wastewater treatment, 6) solid waste management, and 7) energy, power and telecommunications. While the sector planning may be outsourced, the capacity for management and integration of all the sector planning works needs to be strengthened in the Oblast. The outsourcing of planning works would help to involve experts and enterprises in the operation and management phase as well.

(2) Recommendation for organizational and institutional capacity development

<u>Enhancement of competitiveness of public service as an employer</u>

Brain drain is the crucial problem facing almost all the departments and management units of the Mangistau Oblast Akimat. The first step to be pursued would be to enhance the competitiveness of public service as an opportunity for work against the booming private sector. To secure staff with

high quality is the first goal. Instead of single-aimed approach focusing on salary increase as pointed out by many directors, a comprehensive approach is recommended comprising wage system improvement coupled with other necessary measures. The following present a basic idea.

1) The wage system reform should be planned and implemented in the context of national policy and in consideration of all relevant factors such as impact on macro-economy, fiscal viability, detailed analysis of the situation and priority area for reform. Previous and ongoing reform efforts at the central government level should carefully be monitored and positive outcomes integrated into the wage system reform in Mangistau Oblast.

2) The wage system reform should be undertaken based on a clear principle of "equity, accountability and transparency", which is compatible with the Civil Service Law setting forth "equal pay for equal work" principle.

3) The wage system reform needs to be promoted in phases over a certain period of time and with priority placed on the sections for which delay in reform could create more serious problems. Environmental management could be the first priority, because it is only the public sector that can play a major role in properly managing environmental resources unlike economic development promotion whose engine is the private sector.

4) Measures to be coupled with wage increase include the following:

    - Adoption of a specific legal instrument on salaries that defines the basic principles for the salary system
    - A review of vacant posts and elimination of redundant posts,
    - A review of the existing job classification system and modification where necessary
    - Introduction of a mandatory performance appraisal system
    - Provision of training programs compatible with job classification and performance appraisal criteria

Division of responsibilities between central ministries and Oblast Akimat

One fundamental issue is division of responsibilities between central ministries and Mangistau Oblast Akimat. Some functions currently tasked to central ministries need to be transferred to Oblast Akimat. This of course should be associated with capacity development of Oblast Akimat staff. The transportation planning function is one of them. Considering the important role the transportation sector would play in developing Mangistau Oblast as a major hub of distribution and transportation network representing the western Kazakhstan, the planning function at regional level at least should be transferred to the Akimat office, while the responsibility for planning from a national point of view could remain with the central ministry. In case of environmental management, better communications and coordination activities between central ministries and the Oblast Akimat are required.

Specific institutional measures

There could be a number of specific practices creating problems at operational level such as the case of tendering system dependent on "low cost principle". All kinds of shortfalls should be listed and improvement measures be adopted.

Promotion of human resource mobility between public and private sectors

One possibility for tackling the brain drain problem would be to enhance mobility of personnel from government offices to private organizations and vice versa. Currently there is no such a system as seconding a staff to a private company on the part of Mangistau Oblast Akimat. This kind of system, once introduced, would contribute to enhancing capacity of government officers,

especially in acquiring practical skills based on experiences on field. Private organizations would benefit from this kind of system through dispatch of their staff to government organizations. Those staff dispatched will be able to grow familiar with laws, regulations and practices of the government, which will contribute to higher efficiency in the company's operation.

Need for public engagement

An area where more flexible management is required would be balance between leadership and public engagement. The economic development away from the energy-sector would motivate small and medium scale entrepreneurs for business development. Improvement of living conditions in rural areas and urban poverty areas would have to engage participation of direct beneficiaries. The participation of these stakeholders in the planning and implementation stages would lead to more successful achievement of the goals. Kind of leadership required in this context would be to open channels for dialogues with the private sector and civil society groups as partners in a true sense and promote collaborative efforts toward common goals with a facilitative role rather than commander role.

8.3 Measures for Private Investment Promotion

8.3.1 Investment and business climate in Mangistau

(1) Investment potentials survey

The investment and business climate of Mangistau is analyzed based on the investment potentials survey being conducted as part of the Study. Results for 45 companies in Aktau, Atyrau and Almaty are summarized below.

Mangistau Oblast

For the questions concerning investment and business climate, answers were chosen from "Excellent", "Good", "Fair", "Bad" and "No idea". "Excellent" and "Good" are regarded as positive answers, whereas "Fair" and "Bad" are viewed as negative answers. "Fair" is interpreted as "not bad, but not good either" indicating existence of some problems.

1) There were 15 questions asked about investment and business climate. Out of this, the factors evaluated positively with proportions of "excellent" and "good" combined exceeding 50%, numbered two, while the factors judged negatively with proportions of "fair" and "bad" combined exceeding 50%, was 9 as shown below.

   (Positively judged factors)

   - Availability of qualified labor
   - Access to foreign market

   (Negatively judged factors)

   - Incentive measures
   - Easiness in acquiring raw materials
   - Easiness in procuring spare parts
   - Simplicity in procedures
   - Clearness and consistency of laws and regulations
   - Provision of information by government on investment climate
   - Access to financial assistance by government

- Overall support by government
- Cleanliness of government

(Factors with split answers)

- Infrastructure
- Wage level of labor
- Quality of labor
- Access to domestic market

2) Overall investment and business climate in Mangistau Oblast was evaluated positively with positive answers accounting for 80%. This fact may look contradictory to the result above. It could be the case that companies' view toward business chance in Mangistau Oblast is positive enough to surpass negative aspects.

3) The questions focusing on human resources aspect also revealed that the interviewed companies see no problem in human resources. This fact, however, does not necessarily mean that the private sector requires no support from the government. The companies indicated a number of measurers they expect to be provided by the government such as strengthening of skill development in Mangistau Oblast and other part of Kazakhstan, provision of financial assistance for skill training by companies and strengthening of basic education.

4) Kind of skill development needed included technical skill, financial management skill and personnel management skill.

Almaty

A set of questions were asked to 30 companies operating in Almaty with regard to their view about possibility of investment in Mangistau Oblast and investment/business climate in Mangistau Oblast.

1) Reflecting the fact that many companies interviewed are not actually operating in Mangistau, there was rather high proportion of "no idea" selected as answer with a range of 20% to 40%. This fact may indicate insufficiency in the dissemination of information on Mangistau Oblast as investment destination.

2) Mangistau Oblast is regarded very positively by Almaty companies as offering high business chance. The companies with high possibility of actually making investment there reached 80%.

3) Concerning the 15 questions about investment and business climate, the factors evaluated positively with proportions of "excellent" and "good" combined exceeding 50%, numbered four, while the factors judged negatively with proportions of "fair" and "bad" combined exceeding 50%, was eight as shown below. The remaining three questions were answered in a split manner, both positive and negative answers accounting for 50%.

(Positively judged factors)

- Incentive measures
- Quality of labor
- Easiness in procuring spare parts
- Simplicity in procedures

(Negatively judged factors)

- Infrastructure
- Wage level of labor
- Easiness in acquiring raw materials
- Clearness and consistency of laws and regulations
- Provision of information by government on investment climate
- Access to financial assistance by government
- Overall support by government
- Cleanliness of government

(Factors with split answers)

- Availability of qualified labor
- Access to domestic market
- Access to foreign market

Atyrau Oblast

Companies in Atyrau were included as target of the survey with a view to make a comparison of Mangistau Oblast and Atyrau Oblast, the two major investment destinations in the western part of Kazakhstan with rich endowment of oil and gas resources

1) Most of the companies interviewed (80%) made no comparison of Atyrau Oblast and Mangistau Oblast before making a decision in investing in Atyrau Oblast. This may be due to endogenous nature of the companies.

2) Concerning the 15 questions about investment and business climate, the factors evaluated positively with proportions of "excellent" and "good" combined exceeding 50%, numbered two, while the factors judged negatively with proportions of "fair" and "bad" combined exceeding 50%, was 13 as shown below.

   (Positively judged factors)

   - Infrastructure
   - Wage level of labor

   (Negatively judged factors)

   - Incentive measures
   - Quality of labor
   - Availability of qualified labor
   - Access to domestic market
   - Access to foreign market
   - Easiness in acquiring raw materials
   - Easiness in acquiring spare parts
   - Simplicity in procedures
   - Clearness and consistency of laws and regulations
   - Provision of information by government on investment climate
   - Access to financial assistance by government
   - Overall support by government
   - Cleanliness of government

3) Overall, investment and business climate in Atyrau Oblast is evaluated negatively with negative view accounting for 67%.

4) Human resource is a problem for 78% of the companies interviewed. Shortage of skilled labor is cited as the problem.

5) The companies expect the government to extend support in skill development by strengthening skill development in Mangistau Oblast and other part of Kazakhstan, provision of financial assistance for skill training by companies and strengthening of basic education.

(2) World Bank survey

A survey was conducted in 2006 by the Forum of Entrepreneurs of Kazakhstan for three oblasts in Kazakhstan including Mangistau as part of a World Bank Program. This survey based on interviews with companies operating in Mangistau Oblast revealed views of the private companies with regard to constraints in business development such as follows.

1) Hiring qualified personnel is difficult for managers posts, professional workers, service people, engineers and human resource specialists.

2) Type of professional works for which recruitment is difficult include “marketing and sales”, “finance, accounting and budgeting”, “management process”, “general management”, “engineering”, “management of factories and machinery” and “information technology”.

3) The major constraints for business development are the following:

- Shortage of qualified personnel,
- Limited access to credit resources,
- Corruption and incompetence of officials,
- Bureaucracy, absence of transparent procedures and delayed decisions by civil servants,
- Dishonest competition,
- High taxes and customs fees,
- Lengthy time required to solve issues with authorities,
- Frequent change of rules and procedures of regulations,
- High and unpredictable costs,
- Unpredictable requirements from officials, and
- Absence of clear norms.

4) Top management people spend all their time to sort out issues with officials.

5) Average length for taxation inspection and customs inspection are 27.4 hours and 14.5 hours respectively. The longest tax inspection took as long as 93.3 hours.

6) The following measures are expected to be taken by the central and oblast government.

(1st Place)	• Adjustment of rates of taxes and fees
(2nd Place)	• Improvement in access to credit resources and reduction of bank credit interest rate
	• Improvement of akimat works in supporting business
(3rd Place)	• Improvement in the procedure of state purchases
(4th Place)	• Improvement in transportation infrastructure
	• In terms of infrastructure, priority is given to motor roads as first, buildings for business development as second and railroads as third.

An interview conducted by the JICA Study Team in July 2007 with a private company operating in

Aktau made similar points as follows.

- It took them 4.0 months to acquire a business license. They had to approach 18 different departments.
- They have no problem in infrastructure. Land is provided. Privileges are beneficial for them.
- There are corruption and nepotism, especially with regard to allocation of railway wagons.
- Supply of spare parts and tools is a problem. They import all the parts from abroad and it is costly. This leads to high level of inventory with 2-3 months lead-time required.
- Communication with Mangistau Akimat is only one-way. No two-way communication exists.
- They want to join some kind of business association, but none is available.

8.3.2 Recommendation for improvement of investment and business climate

There is a big room for Mangistau Oblast Akimat office to make further effort in improving investment and business climate of Mangistau Oblast. It seems that there is a gap between the view of private companies and that of Oblast Akimat officers concerning the investment and business climate in the Oblast. The level of satisfaction of the companies seems to be lower than what the Akimat office assumes.

The following directions should be pursued.

(1) High potentials of Mangistau Oblast as investment destination will be augmented by strengthening promotional programs aiming at wider and more thorough penetration of information into potential investors outside Mangistau Oblast.

(2) The Mangistau's attractiveness as investment destination should be enhanced by streamlining various procedures related to license, export and import, registration, closing of business and others. The emphasis of the public sector's involvement, however, should be shifted away from these procedural matters but directed more toward environmental management. Training of Akimat officers in more advanced countries in these aspects would be effective in improving the investment climate of Mangistau. Candidate countries ranked higher than Kazakhstan by the World Bank survey include Singapore (ranked 1st), Thailand (15th) and Malaysia (24th).

(3) There should be increased opportunities of dialogues between the Akimat and private organizations on a regular and frequent basis for promoting exchange of information.

(4) Problems in accessing market, both domestic and foreign, and difficulty in procuring raw materials and spare parts could be overcome by tackling both physical and institutional factors such as improvement of communications infrastructure, streamlining of complicated and time consuming procedures and consistent and clear application of laws and regulations.

(5) More supportive roles of the Akimat will be required in extending financial support schemes to private companies. Existing financial assistance schemes could be utilized more effectively once private companies are guided by the Akimat more elaborately in making applications and implementing their projects

(6) The Akimat should strengthen its effort in eradicating corruptive practices.

(7) The Caspian State University of Technology and Engineering is expected to contribute greatly to dissolving the gap between demand and supply of qualified personnel once it starts to send graduates to the society. Continuous efforts will be required to monitor the performance of the graduates, especially paying attention to matching of kind of specialties required by the private sector and the educational curricula.

(8) The level and type of posts to be filled by the graduates from the University, however, will be limited to those of managers and experts. Specific measures need to be taken to enhance the vocational training function for general labors so that qualified workers with suitable skills are supplied to the labor market in a sufficient number both for energy-sector and non-energy sector companies. The following steps needs be followed in working out a plan for enhancing the vocational education programs:

- Estimate of job opportunities to be created in the future
- Clarification of kind of jobs to be created
- Clarification of the capability of the existing vocational training organizations, both in quantity and quality
- Comparison of demand and supply capacity both in quantity and quality
- Identification of need for strengthening vocational education programs
- Preparation of specific plans for strengthening vocational education programs

(9) Improvement of basic education and higher education, which has been degrading since the independence is also an important issue from the perspective of investment and business climate.

CHAPTER 9 IMPLEMENTATION PROGRAM

9.1 Stage-wise Development Plan

9.1.1 Mangistau regional development strategy

The Mangistau regional development strategy established by the Master Plan should be pursued, aiming at: (1) diversification of the economy, (2) broad-based enhancement of livelihood of residents, and (3) improved environmental management. These aims are expressed in the economic, social and environmental objectives of the Mangistau regional development established in Section 5.1. These objectives are mutually interrelated, and the emphasis on any objective would be different for different phases of the planned development.

The initial priority for the Mangistau regional development should be placed on the economic diversification drive, while measures for broad-based enhancement of livelihood are initiated, and imminent environmental problems alleviated. High economic growth is required to diversify the regional economy under the stable macro socio-economic conditions. The oil and gas industry should continue to be the driving force for the regional economic growth, and utilized to diversify the regional economy by inducing related local industries and services.

The diversification of the regional economy under the high economic growth would allow the generation of a large number of lucrative employment opportunities, thus contributing to the social objective as well. The development of SME's and various services would be particularly important for the social objective. The imminent environmental problems such as oil wastes and air pollution can be alleviated more easily under the high economic growth. The creation of improved living environment is increasingly an important condition for attracting new business and investments, and constitutes also the basic condition for tourism and related services.

To pursue the economic diversification drive, core infrastructure projects contained in the Regional Spatial Structure Strengthening Initiative should be completed during Phase 1 (up to 2011) and Phase 2 (2012-15). This, in fact, is the way to jump-start the strategic regional development of Mangistau. The core infrastructure will be particularly instrumental for developing the logistic industry as the key future function of Mangistau.

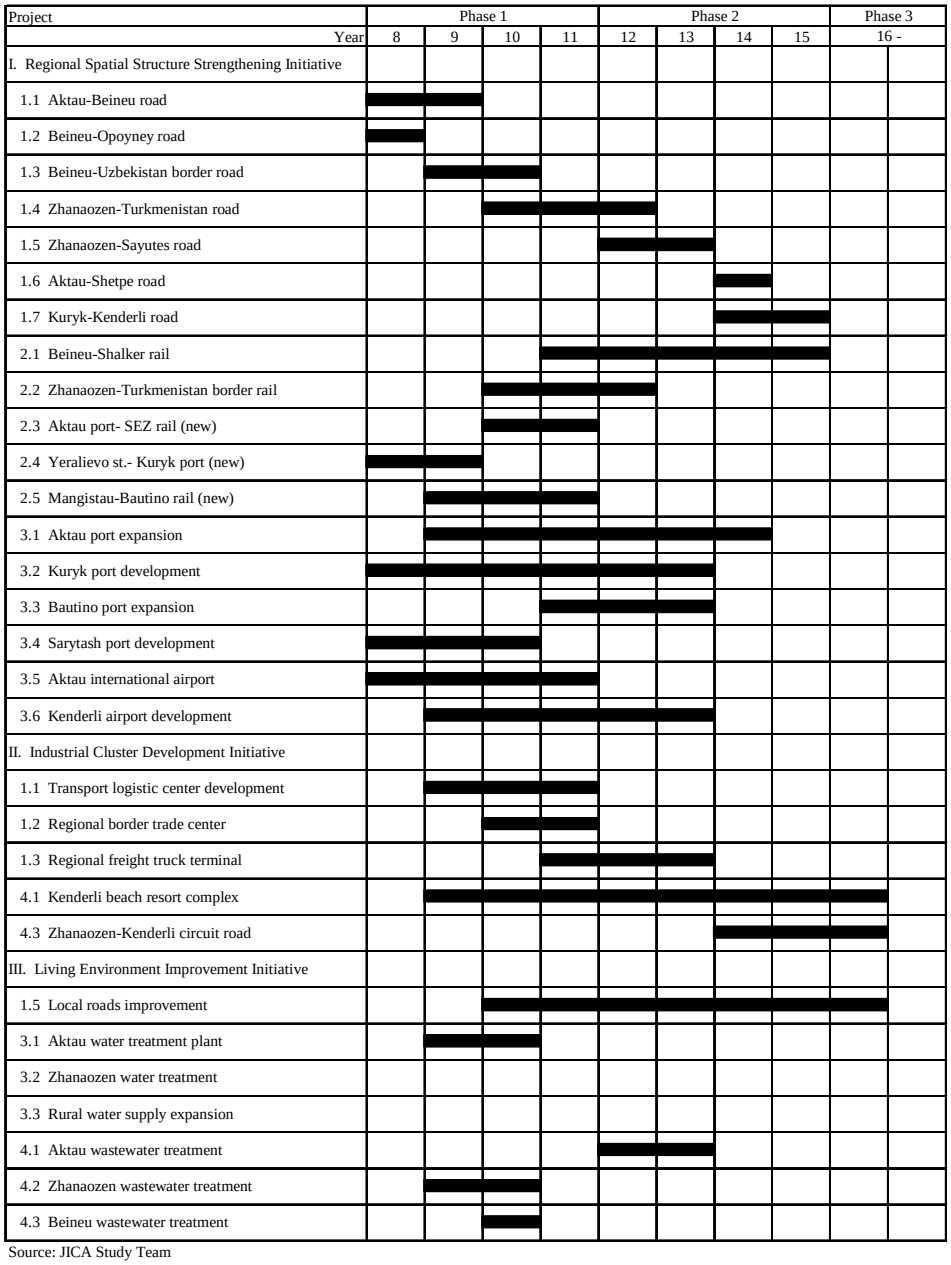
Support measures for the Industrial Cluster Development Initiative should be introduced in the immediate future in full scope. Support measures for the Morport Aktau SEZ and SME's are most important. The gas chemistry operation should also be facilitated. The new livelihood activities proposed under the Living Environment Improvement Initiative should be initiated or promoted, while social and utility services continue to be improved. They include breed improvement of sheep while maintaining the diversity of livestock, greenhouse agriculture and drip irrigation, and fishery revitalization.

Following the jump-start of the strategic regional development of Mangistau, linkage industries, derivative industries and various forms of tourism and related services will become fully operational by the end of Phase 2. Some livelihood activities initiated earlier will become viable economic activities. The linkage and derivative industries will be integrated with the oil and gas

industry in steps to increase the local contents of the core industry. Tourism and related services will diversify increasingly, extending to conference, shopping, cultural, adventure and other tourism activities and related commercial, financial, social and other services.

9.1.2 Implementation schedule for infrastructure and utilities

In line with the phasing strategy for the Mangistau regional development described above, the implementation of infrastructure and utilities is scheduled as shown in Figure 9.1. As seen from the figure, all the core infrastructure projects in the Regional Spatial Structure Strengthening Initiative and most other projects to be implemented by either PPP or the private sector initiative are scheduled to complete by the end of Phase 2. Other infrastructure and utility projects will be implemented continually from Phase 1 or Phase 2 through Phase 3 (beyond 2016).



Source: JICA Study Team

Figure 9.1 Implementation Schedule for Infrastructure and Utilities Projects

9.2 Indicative Investment Schedule

9.2.1 Financial framework

(1) Macroeconomic projection for Kazakhstan

GDP and population projection

The GDP estimate for 2005-06 and projection for 2007-15 have been obtained from the Ministry of Economy and Budget Planning. The GDP estimate is consistent to the GRDP data for Mangistau Oblast. The GDP projection for 2007 is adjusted to KZT 11,600 billion to make it consistent with the GRDP estimate of KZT 661.6 billion in 2007 for Mangistau. Taking 2007 as the base year, the GDP is projected to the year 2015 at 10% per annum. The GDP in 2015 is thus calculated to be KZT 24,900 billion.

The population of Kazakhstan started to increase in 2002, following the continuous decline after the independence. The population growth was at a modest rate of 0.79% per annum during 2002-05. The population is estimated to be 15,500,000 in 2007. It is projected to increase at the annual average rate of 1.1% during 2007-11, and 1.2% during 2012-15. The population is projected to reach 17,000,000 in 2015.

Consequently, the per capita GDP is projected to increase from KZT 752,300 in 2007 to KZT 1,464,700 in 2015. The per capita GRDP of Mangistau Oblast is 2.21 times larger than the per capita GDP in 2007. The ratio will decrease slightly to 1.97 times by 2015, although the gap will increase.

Public investment

The amount of public investment that may be available up to 2015 is estimated by a simple method. The investment efficiency as measured by the incremental capital-to-output ratio (ICOR) between the fixed capital investment (FCI) and the GDP have improved significantly in recent years as analyzed in Section 2.1. The ICOR value is assumed at 2.5 for 2008-11, and 3.0 for 2012-15. The share of public investment in the total investment is 43% in 2007, and 40% is assumed for 2008-15. Then, the total public investment is estimated to be KZT 5,411 billion during 2008-11, and KZT 9,508 billion during 2012-15 (Table 9.1).

It should be noted that of the total public investment, a large portion is made by state enterprises. In fact, of the total FCI in Kazakhstan, the government FCI accounts for about 15% in recent years. Thus, the government investment would be KZT 2,025 billion during 2008-11, and KZT 3,555 billion during 2012-15.

Table 9.1 Macroeconomic Projection of Kazakhstan, 2008-15

(Unit: KZT 10^9)

	2007		2011		2015
GDP	11,600		17,000		24,900
ICOR		2.5		3.0	
Incremental GDP		5,400		7,900	
Cumulative FCI		13,500		23,700	
Public investment share (%)		40		40	
Public investment		5,400		9,480	

Source: Projections by the JICA Study Team

(2) Investment projection for Mangistau

The same method is used for the projection of investment in Mangistau Oblast. The ICOR value, however, is assumed at 3.0 during 2008-11, implying low investment efficiency initially than the national average. The investment efficiency would improve to the ICOR value of 2.5 for 2012-15 as the result of cumulative effects. The cumulative fixed capital investment is calculated to be KZT 921 billion during 2008-11, and KZT 1,213 billion during 2012-15 (Table 9.2).

The fixed capital investment (FCI) in Mangistau was KZT 143.1 billion in 2006, corresponding to 24.4% of the GRDP in the same year. The projection above implies that the ratio of the FCI to the GRDP will be 30.0% during 2008-11, and 26.8% during 2012-15.

The share of Mangistau in the total public investment in Kazakhstan will depend on various factors. More important factors include the priority policy of the Government, presence of major infrastructure projects of national importance, and activities of large state enterprises in the Oblast. If the share is 6.0%, close to the GRDP share of Mangistau in the GDP during 2007-15, the public investment allocation to Mangistau Oblast will be KZT 895 billion during 2008-15. This corresponds to 41.9% of the projected FCI in Mangistau. The balance of KZT 1,239 billion will have to be invested by the private sector, including both domestic and foreign investors, to attain the expected GRDP growth. Again, a large portion of the public investment would be made by state enterprises.

As noted above, the government FCI accounts for about 15% of the total FCI in Kazakhstan. The FCI-to-GDP ratio is taken to be some 25% over the planning period. Then, the government FCI will be KZT 5,580 billion during 2008-15. Taking 6% of this total, the allocation of the government FCI to Mangistau may be KZT 133 billion in 2008-11 and KZT 202 billion in 2012-15 for the total of KZT 335 billion.

Table 9.2 Projection of Investment in Mangistau, 2008-15

(Unit: KZT 10^9)

	2007		2011		2015
GRDP	661.6		968.6		1,453.7
Incremental GRDP		307.0		485.1	
ICOR		3.0		2.5	
Cumulative FCI		921.0		1,212.8	

Source: Ibid.

(3) Financial framework for Mangistau regional development

The FCI in Mangistau Oblast has been projected by the Oblast government. In addition to the investments by the Republican and the Oblast governments, domestic and foreign enterprises would contribute to the investment into transport and communications infrastructure, utilities and some social facilities. The total public investment combining all these corresponds to 15-25% of the total FCI in different years as projected (Table 9.3). It is reasonable to expect that this ratio would increase to 25% during the current medium term plan period, and would be maintained up to 2015.

The fixed capital investment in Mangistau is expected to increase more rapidly than the GRDP during 2008-11, and then its increase would slow down for 2012-15 according to the Oblast projection. The ratio of the FCI to the GRDP would exceed 30% during 2008-11, and decline below 20% after 2013. More reasonable relationship between the FCI and the GRDP has been assumed here as shown. Then, the ratio of the public investment to the total FCI is taken to be 25% as determined above. The projection is summarized in Table 9.4. The total public

investment is KZT 253.5 billion during 2008-11, and KZT 336.6 billion during 2012-15 for the total of KZT 590.2 billion over 2008-15.

Table 9.3 Fixed Capital Investment Projection by the Oblast

(Unit: KZT 10^6)

	2006	2007	2008	2009	2010
Total FCI	229,755	242,083	272,345	288,949	274,340
Government FCI					
Republican	5,019	17,234	28,114	30,576	334
Oblast	2,633	7,732	12,488	12,652	13,415
Contribution by enterprises	25,063	27,088	26,827	28,128	29,492
Sub-total (public FCI)	32,715	52,054	67,429	71,356	43,241
Share of public FCI in total FCI (%)	14.2	21.5	24.8	24.7	15.8

Source: Mangistau Oblast Akimat

Table 9.4 Projection of Public Investment for Mangistau Regional Development

(Unit: KZT 10^9)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
GRDP	661.6	727.8	800.5	880.6	968.6	1,072.1	1,186.6	1,313.4	1,453.7
Total FCI	198.5	218.3	240.2	264.2	290.6	287.3	318.0	352.0	389.6
Public FCI	49.6	54.6	60.1	66.1	72.7	71.8	79.5	88.0	97.4

Source: Projections by JICA Study Team

(4) Government budgets and investment by sector

The capital expenditure by the Oblast consists of portions executed by the Republican and the Oblast budgets. The actual capital expenditure by the Oblast in 2006 and the approved budget for the capital expenditure in 2008 are summarized in Table 9.5. As seen from the table, a large portion of the capital expenditure by the Oblast is directed to education, public health, housing and communal services rather than to economic infrastructure. These sectors have a combined share of 54.9% in the actual capital expenditure in 2006, and 70.3% in the proposed budget for capital expenditure in 2008.

Table 9.5 Oblast Budget and Investment by Sector, 2006 (actual) and 2008 (approved)

(Unit: KZT 10^6)

Sector	2006 (actual)			2008 (approved)		
	Republican	Oblast	Total	Republican	Oblast	Total
Education	374	1,096	1,470	4,052	603	4,655
Public health	100	117	217	2,276	557	2,833
Water supply	26	500	526	463	383	846
Social security	0	0	0	1,212	76	1,288
Housing & communal services	1,633	886	2,519	2,319	2,126	4,445
Transport infrastructure	93	0	93	539	454	993
Agriculture	0	15	15	0	295	295
Defense & public order	2,085	0	2,085	0	0	0
Culture, tourism & sports	0	0	0	0	292	292
Others	707	20	727	150	518	668
Total	5,019	2,633	7,652	11,021	5,974	16,995

Source: Oblast Akimat

9.2.2 Indicative investment schedule

In line with the implementation schedule for infrastructure and utilities shown in Figure 9.1 and the phasing strategy presented in the previous section, an indicative investment schedule is prepared, including all the proposed projects and programs.

As seen from Table 9.6, the total investment cost for all the proposed projects and programs is US$4,955.5 million during Phase 1 through Phase 3. The investment cost by phase is US$2,877.1 million in Phase 1, US$1,699.9 million in Phase 2, and US$378.5 million in Phase 3. These costs are compared with the financial framework of public investment allocation to Mangistau worked out above.

Table 9.6 Transfers between Mangistau Oblast and Other Administrative Levels, 2004-07

(Unit: KZT 10^6)

Transfers	2004	2005	2006	2006
To other administrative levels	10,139	15,994	24,736	24,736
From the Government	1,060	3,008	5,095	12,922

Source: Oblast Akimat

The total public investment to Mangistau is projected to be US$2,113 million in Phase 1 and US$2,805 million in Phase 2 for the total of US$4,918 million up to the year 2015. The estimated total investment cost up to the end of Phase 2 or US$4,577.0 million is within the projected financial framework, and only small portion of the proposed projects and programs would be crowded out to Phase 3 beyond 2016.

The investment requirements in Phase 1, however, exceed the projected public investment allocation considerably, while in Phase 2, the investment requirement is within the projected financial framework. These situations are precisely the reflection of the jump start of the Mangistau regional development. To reconcile the investment requirement and the public investment allocation, either the contribution by enterprises should be increased or the Government support for Oblast increased. The latter may be justified as the Mangistau regional development is expected to contribute indeed to the national socio-economic development.

As seen from Table 9.5, a large portion of capital expenditure by the Oblast is directed to education, public health, housing and communal services rather than economic infrastructure. Therefore, if the projected public investment allocation is used for the projects and programs proposed in the Master Plan, a good portion of the regular expenditure will be crowded out. To avoid this to happen, the capital transfer between the Central and the Oblast governments may be reviewed.

Mangistau Oblast contributes significantly to other levels of public administration by transfers from its current budget as well as capital transfer to other levels of public administration included already in its capital budget. At the same time, the Oblast receives official transfers from the Government. These transfers in recent years are summarized in Table 9.6.

In 2006, Mangistau Oblast contributed the net transfer of KZT 11,814 million to the Central Government as seen in Table 9.6. This amount covers practically the entire capital expenditure for the regular investment programs as shown in Table 9.7. If this amount is combined with the projected public investment allocation to Mangistau as shown above, the total amount would be sufficient for both the projects and programs proposed in the Master Plan and the regular public capital expenditure.

Table 9.7 Indicative Investment Schedule

(Unit: US$10^6)

Project title	Status	Implementing agencies	Investment cost			
			Phase 1	Phase 2	Phase3	Total
I. Regional Spatial Structure Strengthening Initiative						
1. Artery roads improvement projects						
1.1 Aktau-Beineu road	On-going	CTID of MTC	81.0	0.0	0.0	81.0
1.2 Beineu-Opoyney road	On-going	CTID of MTC	64.0	0.0	0.0	64.0
1.3 Beineu-Uzbekistan border road	Planned	CTID of MTC	25.0	0.0	0.0	25.0
1.4 Zhanaozen-Turkmenistan border road	Planned	CTID of MTC	35.0	18.0	0.0	53.0
1.5 Zhanaozen-Sayutes road	Planned	Oblast	0.0	28.0	0.0	28.0
1.6 Aktau-Shetpe road	Planned	Oblast	0.0	12.0	0.0	12.0
1.7 Kuryk-Kenderli road	Planned	Oblast	0.0	22.0	0.0	22.0
		Sub-total	205.0	80.0	0.0	285.0
2. Railway network development projects						
2.1 Beineu-Shalker line	Planned	KTZ, Oblast	40.0	160.0	0.0	200.0
2.2 Zhanaozen-Turkmenistan border (new)	Planned	KTZ, Oblast	200.0	100.0	0.0	300.0
2.3 Aktau port-SEZ (new)	Planned	Private	9.0	0.0	0.0	9.0
2.4 Yeralievo station-Kuryk port (new)	Planned	Private	63.0	0.0	0.0	63.0
2.5 Mangistau-Bautino (new)	Planned	Private	189.0	0.0	0.0	189.0
		Sub-total	501.0	260.0	0.0	761.0
3. Ports and airports development						
3.1 Aktau port expansion	On-going	AISCP	115.0	115.0	0.0	230.0
3.2 Kuryk port development	Planned	Oblast (PPP)	716.3	358.2	0.0	1074.5
3.3 Bautino port expansion	Planned	Private	26.7	53.3	0.0	80.0
3.4 Sarytash port development	Planned	Private	300.0	0.0	0.0	300.0
3.5 Aktau international airport upgrading	On-going	Oblast (PPP)	201.0	0.0	0.0	201.0
3.6 Kenderli airport development	Planned	Oblast (PPP)	160.0	160.0	0.0	320.0
		Sub-total	1519.0	686.5	0.0	2205.5
4. Aktau city development project						0.0
		Total-I	2225.0	1026.5	0.0	3251.5
II. Industrial Cluster Development Initiative						
1. Logistics cluster support program						
1.1 Transport logistic center development	Planned	Morport Aktau SEZ	107.5	0.0	0.0	107.5
1.2 Regional border trade center	New	Oblast (PPP)	8.0	0.0	0.0	8.0
1.3 Regional freight truck terminals	New	KTZ, Oblast	18.8	18.8	0.0	37.6
		Sub-total	134.3	18.8	0.0	153.1
2. Linkage industries cluster support program						
2.1 Business incubation development program	New	Oblast, University	0.1	0.2	0.0	0.3
2.2 Enterprise development and support unit establishment	New	Oblast	1.3	1.3	0.0	2.6
		Sub-total	1.4	1.5	0.0	2.9
3. Derivative industries cluster support program	New	Sub-total	0.0	0.0	0.0	0.0
4. Tourism industries cluster support program						
4.1 Kenderli beach resort complex development	Planned	PPP	200.0	400.0	200.0	800.0
4.2 Aktau tourist attractions development	New	Private				0.0
4.3 Zhanaozen-Kenderli circuit road	Planned	Oblast	0.0	38.0	38.0	76.0
		Sub-total	200.0	438.0	238.0	876.0
		Total-II	335.7	458.3	238.0	1032.0
III. Living Environment Improvement Initiative						
1. Rural livelihood development program						
1.1 Livestock support sub-program	New	DOA, KazAgrofinance, Mang. Agroserv.	3.0	3.0	3.0	9.0
1.2 Crop production promotion	New	DOA, Private	6.0	0.0	0.0	6.0
1.3 Fishery support sub-program	New	Fishery section of Oblast Agric. Dept.	4.8	4.8	0.0	9.6
1.4 Groundwater management	Extension	DOCS, DOA, DNR&WM, Rayon Akimat	6.3	6.3	0.0	12.6
1.5 Local roads improvement	Extension	Oblast	0.0	109.0	100.0	209.0
		Sub-total	20.1	123.1	103.0	246.2
2. Social services improvement projects						
2.1 General education facilities expansion	Extension	DOE	60.3	30.2	30.2	120.7
2.2 Caspian State University of Technology & Engineering	On-going	MOE, Oblast	150.0	28.0	0.0	178.0
2.3 Medical doctors cultivation	Extension	DOH	0.8	2.0	1.6	4.4
2.4 Maternity hospitals strengthening	Extension	DOH	0.4	0.0	0.0	0.4
2.5 Tuberculosis hospitals strengthening	Extension	DOH	0.3	0.0	0.0	0.3
2.6 Counseling system support program	Extension	DOH	0.1	0.4	0.4	0.9
		Sub-total	211.9	60.6	32.2	304.7
3. Urban and rural water supply expansion projects						
3.1 Aktau water treatment plant	Planned	MAEK	22.4	0.0	0.0	22.4
3.2 Zhanaozen water treatment plant	Planned	Zhanaozen city	10.0	0.0	0.0	10.0
3.3 Rural water supply expansion	Extension	Rayons	6.4	0.0	0.0	6.4
		Sub-total	38.8	0.0	0.0	38.8
4. Wastewater treatment improvement projects						
4.1 Aktau wastewater treatment plant	Planned	TVS&V	0.0	8.3	0.0	8.3
4.2 Zhanaozen wastewater treatment plant	Planned	Ozeninvest	17.0	0.0	0.0	17.0
4.3 Beineu wastewater treatment plant	Planned	Beineu rayon	3.7	0.0	0.0	3.7
		Sub-total	20.7	8.3	0.0	29.0
		Total-III	291.5	192.0	135.2	618.7
IV. Mangistau Environmental Initiative						
1. Caspian seawater monitoring center	New	MOEP, MOE, oil companies	10.0	10.0	5.0	25.0
2. Koshkar Ata tailing pit reclamation	Planned	MOEP	12.5	12.5	0.0	25.0
3. Mangistau protected areas networking	New	FFHC, DNR&WM, SE. for eco-tourism dev't.	0.5	0.5	0.2	1.2
4. Desertification prevention	New	DNR&WM, SE for vegetation cover, MOA	1.2	0.0	0.0	1.2
5. Oil wastes treatment	New	MOEP, private/state enterprises	0.4	0.0	0.0	0.4
6. Environmental education & awareness program	New	MOE, MOEP, DNR&WM, schools	0.1	0.1	0.1	0.3
7. Clean development mechanism application program	New	MOEP, private/state enterprises	0.2	0.0	0.0	0.2
		Total-IV	24.9	23.1	5.3	53.3
		Grand Total	2877.1	1699.9	378.5	4955.5

Source: JICA Study Team

Of the total investment cost, the private sector is expected to contribute US$640.0 million during Phase 1 through Phase 2, and additional investments totaling US$2,403.5 million are expected by PPP. If the latter are assumed to be supported 60% by the private sector, the total private sector contribution would become US$2,081.1 million, corresponding to 42.9% of the total public investment. This ratio, however, is smaller than the ratio 51.2% of the private sector contribution to the public investment requirement projected by the Oblast Akimat for the period of 2006-10. Additional costs are expected to be borne by oil companies for some environmental projects, and state enterprises such as MAEK, TVS&V and Ozeninvest for utilities, and KTZ for railways.

9.3 Initial Actions

(1) Master Plan adoption

To implement the Mangistau regional development, the strong initiative by the Oblast Akim and full cooperation of the private sector are indispensable. To ensure these, the Master Plan proposals should be first discussed extensively by broad stakeholders, possibly by sector, and sector conflicts should be resolved. It is desirable that the Master Plan should be adopted formally with addenda if necessary. All the stakeholders participated in this discussion process would have consolidated view on the Mangistau regional development and its strategy. The Oblast Akimat may make its commitment to the initiative visible by promulgating a relevant ordinance or the like.

Based on this, the Oblast Akim would be in a position to seek stronger support of the Government and the international society for the Mangistau regional development. It is expected that the Government should establish a policy to support the jump-start of the Mangistau regional development, recognizing its importance for the socio-economic development of Kazakhstan as a whole, in particular for the establishment of the logistic function in the broad east-west trade and distribution. The priority policy should be embodied in the preferential budget allocation to some core infrastructure projects of national importance.

(2) Initial actions for key elements

Some projects and programs contained in the Master Plan may be further developed and implemented within the policy and capacity of sector implementing agencies. They include the continual improvement and expansion of general education facilities, public hospitals and clinics, and utilities as well as most housing. Also, some infrastructure facilities would be implemented by related private enterprises. For certain core facilities and key activities proposed by the Master Plan, however, deliberate efforts would be necessary to promote and implement them according to the Master Plan.

<u>Promotion of Morport Aktau SEZ</u>

The Morport Aktau SEZ is instrumental in the economic diversification drive during the initial Mangistau regional development. The effective marketing strategy for the SEZ should be established to promote it for prospective investors and enterprises, clarifying the basic requirements by investors and major advantages or strong points of the Aktau SEZ. The basic requirements include clear administrative procedure for registration and business operation at the SEZ, availability of human resources in sufficient quantity and quality, and incentive measures comparable to SEZ's or similar facilities elsewhere. Possible advantages of the Aktau SEZ that may be established include the following: 1) preferential market access to the Caspian Sea rim and other neighboring countries, 2) logistic center as the core function, and 3) abundant utilities at low costs.

To satisfy the basic requirement of the administrative procedure, a one-stop consulting center may be established within the SEZ as a window of relevant ministries. It should be linked on-line with related Central Government agencies in Astana, and also foreign agencies. An automatic system should be introduced for on-line application and approval of investments with a standard format. To satisfy the basic requirement of human resources, a time-bound legislation may be introduced to relax the restriction on the employment of foreign workers dictated by the Law on Employment and Rules of Hiring Foreign Labor Force exclusively for the SEZ.

A major promotion campaign may be organized jointly by the Government and the Oblast Akim to sell the Aktau SEZ widely to foreign and domestic investors and enterprises. The website of the Aktau SEZ should be much improved to provide information on FDI laws including corporate law, tax law and labor law, related legislative amendments, decrees and declarations, achievements of foreign investments and their evaluation by investors, and others as well as to appeal the advantages of the SEZ.

Introduction of support for SME's

SME development holds a key for the development of manufacturing industries including linkage industries supplying parts and components to the oil and gas industries. Innovation of the SME's in Mangistau cannot be expected on the individual enterprise base due to their limited capacities with respect to credibility, financial security and technical capability. The SME support measures such as consultancy, training, financing and business support currently provided separately by different agencies should be integrated and provided to SME groups or cooperatives for effectiveness. The SME upgrading system with these measures should be applied to the SME's located in the SME industrial estate being established in Munaylinsky.

The SME upgrading system consists of sub-systems of project finance, group finance, and group consultancy linked with finance, which combined would work as a unified innovative system for SME's. To build up the financier confidence and trust on the management capacity of the borrowing SME's, the legal status of SME groups should be clarified. It is desirable that SME groups should be established as legal entities, following established guidelines for commercial business operation with good management capacity including compliance with auditing and accounting standards. Official consultancy and guidance need to be provided as essential conditions for the project finance. An enterprise development and support unit may be established within the Private Business Industry Department of the Akimat as a one-stop consulting center especially for SME's.

Definite scheduling of core infrastructure projects

The core infrastructure projects contained in the Regional Spatial Structure Strengthening Initiative will collectively enhance the competitiveness of various economic activities by reducing economic transaction costs. The emphasis is placed on establishing a multi-modal transport system comprising roads, railways and terminal facilities, and on strengthening urban functions and selected rural service centers in line with the basic strategy. This will particularly facilitate the development of logistic industry.

It is vitally important, therefore, that these core infrastructure projects be implemented as planned following the stage-wise development plan. Some infrastructure projects are expected to be implemented by the private sector initiative or by PPP. To ensure the timely implementation of all the projects, a coordinating session should be convened by the Oblast Akimat's initiative, and the commitment by relevant private entities should be confirmed. Based on that, a definite implementation schedule should be prepared for all the core infrastructure projects.

Initiation of livelihood improvement

Some new livelihood activities should be initiated or further promoted to diversify more lucrative income opportunities for rural residents including some returned Kazakh. They include the application of a new livestock model for sheep and goats, greenhouse agriculture and drip irrigation for crop production, and re-vitalization of fishery. The first step for the livestock development would be to encourage individual farms to organize into larger village farms by providing a subsidy for the purchase of new breed sheep on the condition that they would undertake joint investment and management of the village farms.

For crop production, the Oblast should introduce a support package with a subsidy or low interest loan scheme for the purchase of equipment and installation of greenhouse agriculture and drip irrigation, technical extension on fertilizer and other input use, and facilitation of farmers organizing for joint procurement and marketing. The greenhouse agriculture may be experimented first by the Oblast initiative, including the local manufacturing of materials and equipment.

For the revitalization of fishery, the Oblast Department of Fishery needs to be much strengthened to plan and implement fishery support measures. The private sector has already started to construct some basic infrastructure for the capture fishery in the Caspian Sea. To allow individual fishermen to share the facilities, the Oblast may introduce a subsidy scheme, by which a portion of the investment cost would be borne by the government on the conditions that the facilities would be made accessible by individual fishermen.

(3) Institutional measures for the PPP and infrastructure maintenance

PPP

The successful development of the Mangistau regional development depends critically on the mobilization of the private sector resources for some public facilities and services. In particular, some infrastructure projects are expected to be implemented by the PPP. In Kazakhstan, PPP has been utilized often from the very beginning of planning for such infrastructures as oil pipelines and ports that are considered to be highly public in nature. To further promote the infrastructure development by PPP significantly, guidelines may be prepared by the Central or oblast governments, encompassing incentives, risk sharing, various forms and techniques applicable to different cases, and information sharing.

Given the large territory to be covered by the transport infrastructure, a main direction for PPP would be preventive maintenance of infrastructure under a long-term contract. This will allow private entities to take effective measures on their own to attain the specified performance levels as agreed by the long-term contracts. To expand this form of PPP, SME's should be supported to develop expertise for operation, maintenance and management of various public services.

Another possible direction for PPP is related to the introduction of a toll road system. It may be difficult, however, to apply PPP for its construction. The realistic approach may be to establish a road corporation by a joint venture between the oblast government or public investment company and the private firm, whereby autonomous operation is effected with the toll revenue and the private capital. The PPP guidelines to be prepared should cover this case as well.

Infrastructure maintenance

The maintenance of infrastructure, particularly important in Kazakhstan with a large territory and harsh climate to ensure its facilities once constructed, would continue to serve the need for a long time. As the stock of infrastructure related to the Mangistau regional development increases, the need for infrastructure maintenance will expand. It is an important consideration that the

infrastructure development should be undertaken only to the extent that the resultant maintenance needs can be comfortably satisfied by available human and financial resources. Therefore, measures should start to be taken to expand the capacity for infrastructure maintenance.

The capacity development for infrastructure maintenance should be effected at the individual, organizational and institutional levels. For the capacity development at the organizational level, an excusive section should be established within the existing sections for various infrastructures such as roads, railway, ports and airports to take charge of maintenance of respective facilities. The capacity development for maintenance should be furthered at the institutional level by establishing an infrastructure maintenance system, which should be supported by manuals for periodic and routine maintenance, database for existing infrastructure, monitoring system, analysis on life cycle costs of infrastructure, economic evaluation of maintenance works and long-term maintenance planning.

9.4 Possible Follow-up Activities for Continued Kazakh-Japan Cooperation

Possible activities to follow up the Study are suggested below for continued cooperation between Kazakhstan and Japan on both the official and the private bases.

JICA

1. Business training by the Kazakhstan-Japan Center for Human Development
2. Dispatch of an expert to follow up the master planning in
    - formulation of training programs
    - advisory to the Oblast Akim on regional development and planning
3. Technical cooperation for a comprehensive feasibility study on the next generation energy-water complex
4. Development of joint research programs with the Caspian State University of Technology and Engineering

Private sector

(1) Gas chemistry operation for methanol, formaldehyde, MMA and polyacetal production

(2) Logistic center in the Morport Aktau SEZ

(3) Aquaculture on the Caspian coast

(4) Exchange program between the Caspian State University of Technology and Engineering and a Japanese university

(5) Desalinization plant by reverse osmosis

These possibilities are suggested for consideration by the Kazakh side. While no commitment to any of them is implied on the Japanese side, aide proposals for selected possibilities are attached in Appendix to this section.

Aid Proposal-1 (Outline):
Caspian Capacity Development Program (CCDP)

(1) Background

Mangistau Oblast is situated in the western end of Kazakhstan facing the Caspian Sea to the west. Its land area is 165,000km^2, accounting for 6.1% of the national territory. The oblast has a population of 374,000, that is, 2.5% of the national population. Mangistau's economy started to grow at an amazing rate of 17.5% per year since 2000 due to the rapid expansion of oil production. While the economic boom is expected to continue in the coming years, it begins to pose a number of problems such as social disparity and environmental degradation. The national and oblast policy is to accelerate growth of non-oil/gas industries, especially medium to small size enterprises, thus spreading the fruits of economic development to wider segments of the population. Vulnerable environment of the oblast needs to be managed appropriately while maintaining the momentum of economic growth.

(2) Objective

The objective of the Caspian Capacity Development Program (CCDP) is to provide opportunities for higher education faculty members, government public servants and private business people of the five countries around the Caspian Sea (Kazakhstan, Russia, Turkmenistan, Iran, and Azerbaijan) to enhance their capacity in technological and social-economic areas so that they will be able to contribute to the economic development of the Caspian Region based on non-fossil energy activities with appropriate environmental management.

(3) Rationale

Capacity development holds the key to development of non-fossil energy industrial activities and proper environmental management. While Mangistau Oblast will play the major role in this program, its benefit should be shared by neighboring regions and countries around the Caspian Sea.

(4) Duration

The program will be implemented over 5 years from 2009 to 2014.

(5) Stakeholders

- Kazakhstan: Caspian University of Technology, Mangistau Oblast Akimat
- Other Caspian countries: Higher education institutes/universities, central/local authorities
- Japan: Japan International Cooperation Agency, Higher Education institutes/universities in Japan, Japan Center
- Other developed countries: Higher education institutes/universities, business people

(6) Program Components

<u>Core components</u>

a) Academic cooperation between the Caspian University of Technology (CUT) and Japanese higher education institutes/universities in technical and social-economic areas, capitalizing on the existing international support programs such as technical cooperation program by JICA (to be pursued). The activities would include intensive dispatch of Japanese faculty

members to CUT as well as general exchange of faculty members and students. The subjects are proposed as follows.

- Oil/gas technology
- Mechanical engineering
- Marine technology
- Business administration
- Computer science
- Energy engineering
- Physics and mathematics
- Environmental management

b) Technical training program for Mangistau Oblast Akimat officers in planning and management subjects capitalizing on the existing Regional Center of Professional Development of Government Employees in Aktau and support by the existing Japan Center in Kazakhstan (to be pursued, no commitment). The subjects would include the following.

Crosscutting approach
- Project cycle management (PCM)
- Integrated regional development master planning (IRDMP)
- Environmental management

Specific subjects
- Urban planning
- Land use planning
- Transportation: road, railroad, port and airport
- Water resources and water supply
- Wastewater
- Solid waste management
- Energy, power and telecommunications

Sub-components

c) Expansion of the CUT-Japan cooperation to other existing vocational colleges in Mangistau Oblast

d) Expansion of the CUT-Japan cooperation to faculty members and students of the higher education institutes in the other 4 countries around the Caspian Sea

e) Expansion of the Japan Center programs to business related-issues for private businessmen in Mangistau Oblast and other 4 countries

f) Development and application of multi-media education programs for CUT, other higher-educations institutes in the Caspian region and Japanese higher education institutes, utilizing satellite telecommunication network and internet TV system.

Aid Proposal-2 (Outline):
Integrated Investment Promotion Initiative (IIPI)

(1) Background

Mangistau Oblast is situated in the western end of Kazakhstan facing the Caspian Sea to the west. Its land area is 165,000km^2, accounting for 6.1% of the national territory. The oblast has a population of 374,000, that is, 2.5% of the national population. Mangistau's economy started to grow at an amazing rate of 17.5% per year since 2000 due to the rapid expansion of oil production. While the economic boom is expected to continue in the coming years, it begins to pose a number of problems such as social disparity and environmental degradation. The national and oblast policy is to accelerate growth of non-oil/gas industries, especially medium to small size enterprises, thus spreading the fruits of economic development to wider segments of the population. Vulnerable environment of the oblast needs to be managed appropriately while maintaining the momentum of economic growth.

(2) Objective

The objective of the Integrated Investment Promotion Initiative (IIPI) is for Mangistau Oblast Akimat office to create a functional mechanism that would enable effective and efficient attraction of investments to Mangistau Oblast.

(3) Rationale

Various activities concerning investment promotion in Mangistau Oblast are carried out separately without sufficient coordination among them. It would be important that a new unit be created directly under Akim's office and it will guide related organizations and sections under a specific framework and coordinate their activities. The new unit is positioned at a level higher than departments and management units.

(4) Duration

The initiative will be implemented over 5 years from 2008 to 2013.

(5) Stakeholders

- Akimat Office
- Department of Economy and Budget Planning
- Department of Entrepreneurs

(6) Program Components

a) Creation of a unit responsible for all activities related with investment promotion directly under Akim's office. It is tentatively called "Investment Promotion Office (IPO)". IPO is positioned at a level higher than departments and management units, exerting strong initiative in investment promotion.

b) To enhance the capacity of Investment Promotion Unit, training programs for the officers will be provided in other countries such as Singapore where economic growth was achieved by successful investment promotion. Experts will also be invited from these countries to provide guidance to IPO.

c) The Investment Promotion Office functions as the headquarters of investment promotion in Mangistau Oblast. Its tasks broadly include preparation of investment promotion strategy, dissemination of information, improvement of investment climate and coordination of related organizations and sections. They are detailed as follows.

Preparation of investment promotion strategy
- Selection of target industries for promotion
- Clarification of demarcation of responsibilities among related organizations and sections
- Preparation of an action plan for investment promotion

Dissemination of information
Dissemination of information on investment climate in Mangistau Oblast to all possible markets both outside and inside Kazakhstan through internet, contact with relevant organizations, media etc.

Improvement of investment climate
- Regular communication with private organizations and companies to broaden understanding on the needs of the private sector
- Promotion of deregulation through guidance of and coordination with organizations and sections responsible for regulations and licenses
- Promotion of human resources development by guiding and coordinating with Caspian University of Technology, vocational colleges and basic education institutes.
- Promotion of infrastructure development through guidance and coordination with organizations and sections responsible for various infrastructure facilities
- Eradication of improper conducts of akimat officers
- Promotion of awareness on environmental management

Coordination with other organizations and sections
- Coordination with departments and management units of Mangistau Oblast Akimat office
- Coordination with state organizations and sections
- Coordination with the private sector