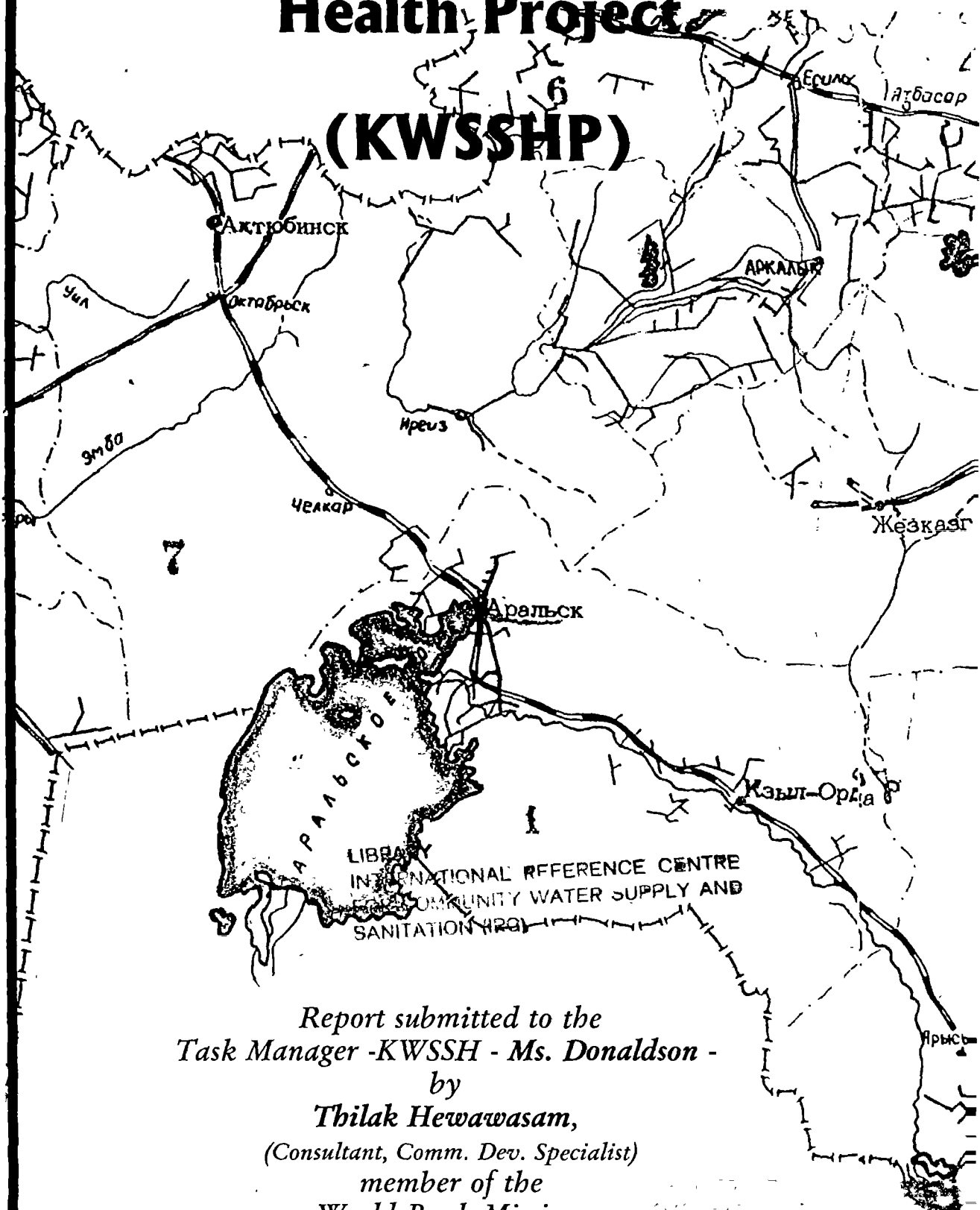


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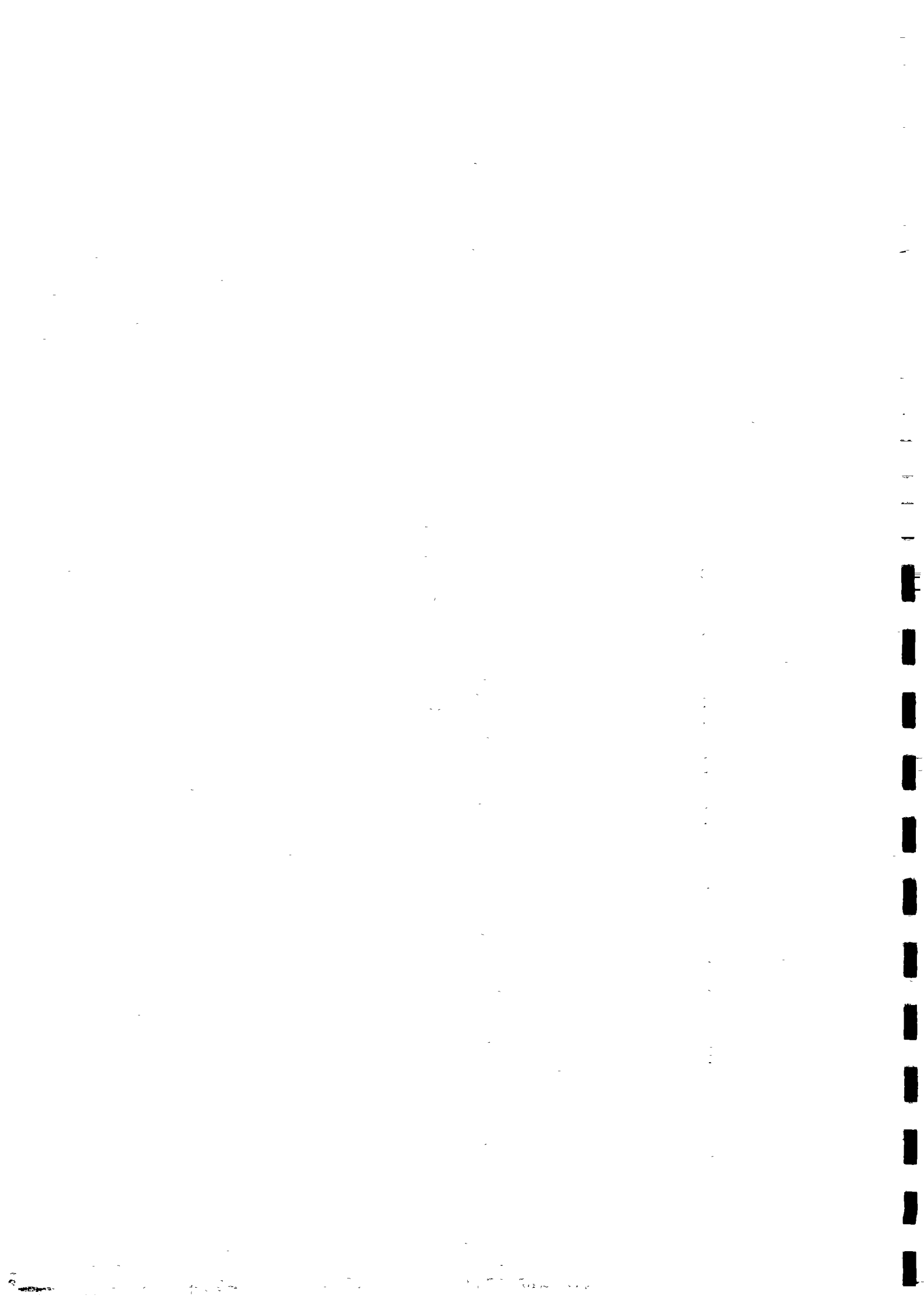
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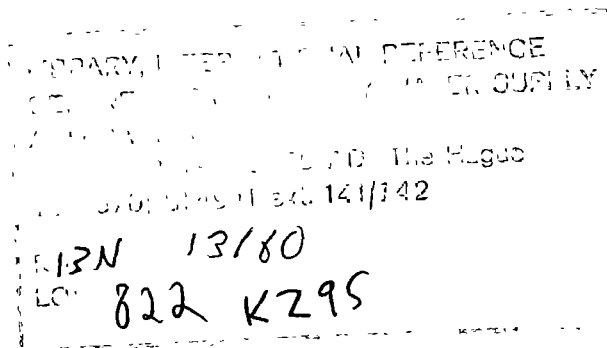
*Report submitted to the
Task Manager -KWSSH - Ms. Donaldson -
by*

*Thilak Hewawasam,
(Consultant, Comm. Dev. Specialist)
member of the
World Bank Mission,
visited Kazakhstan
during
25th June to 10th July 1995.*

822-95-13160



Kazakhstan Water Supply, Sanitation & Health Project (KWSSHP)



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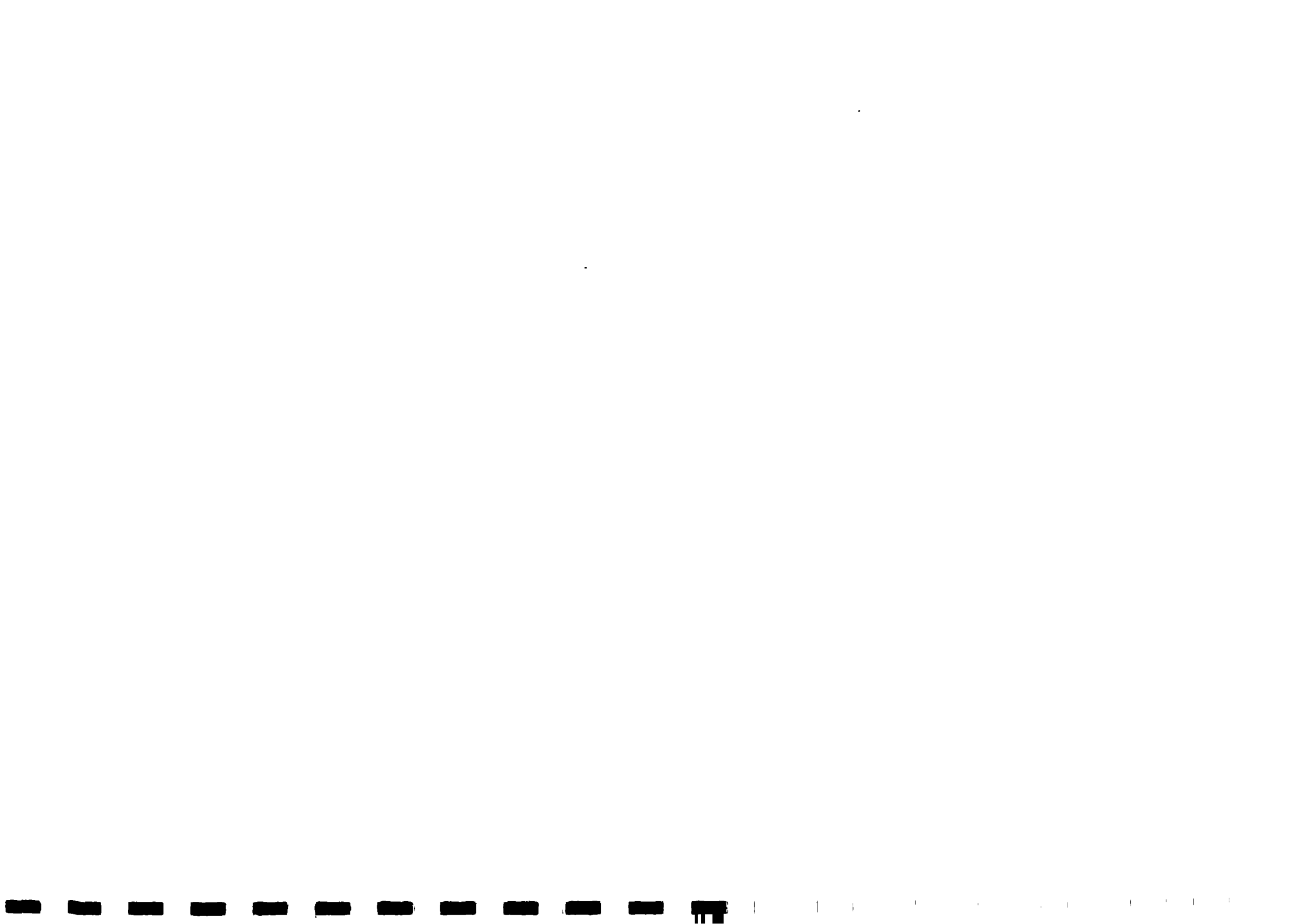
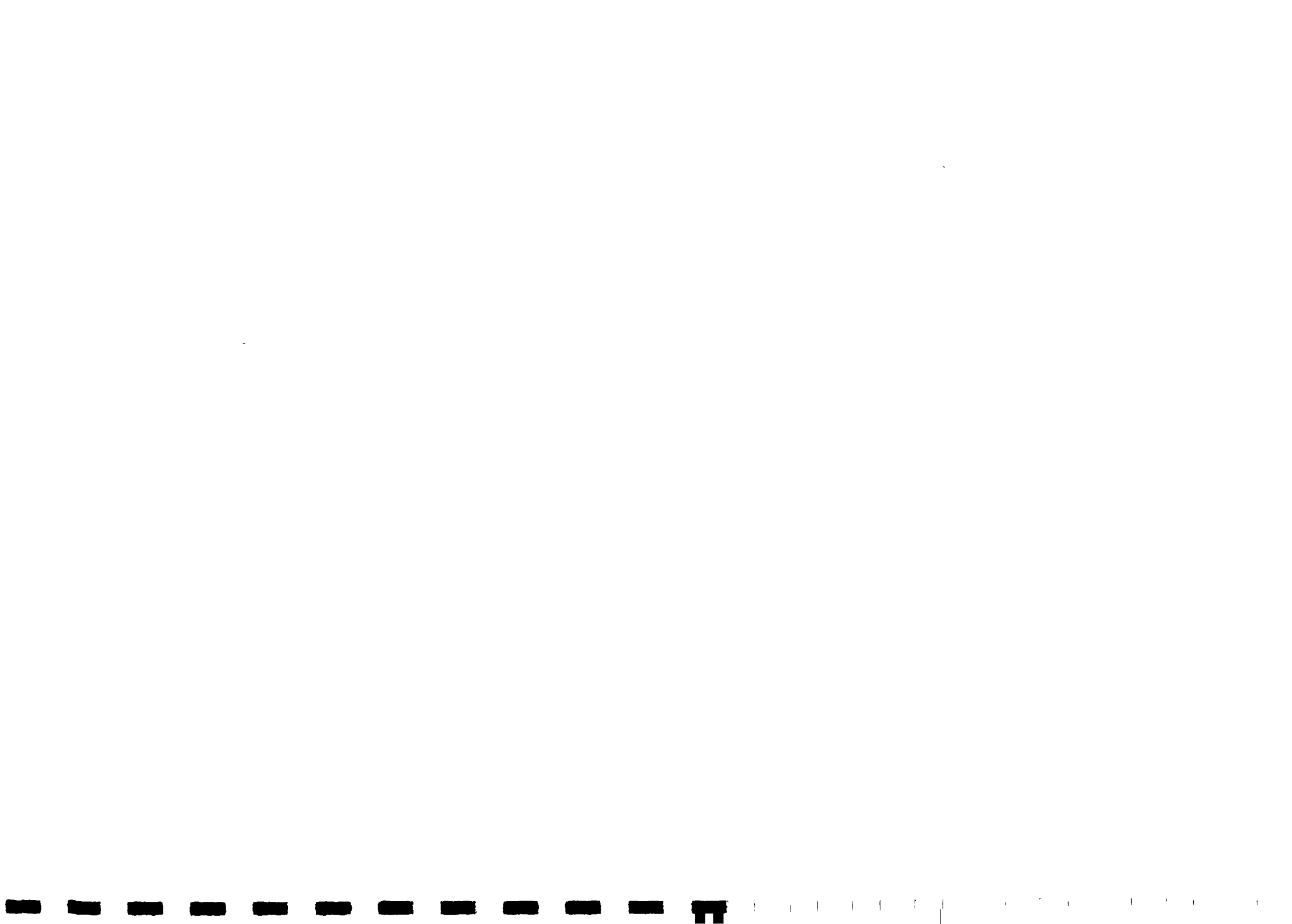


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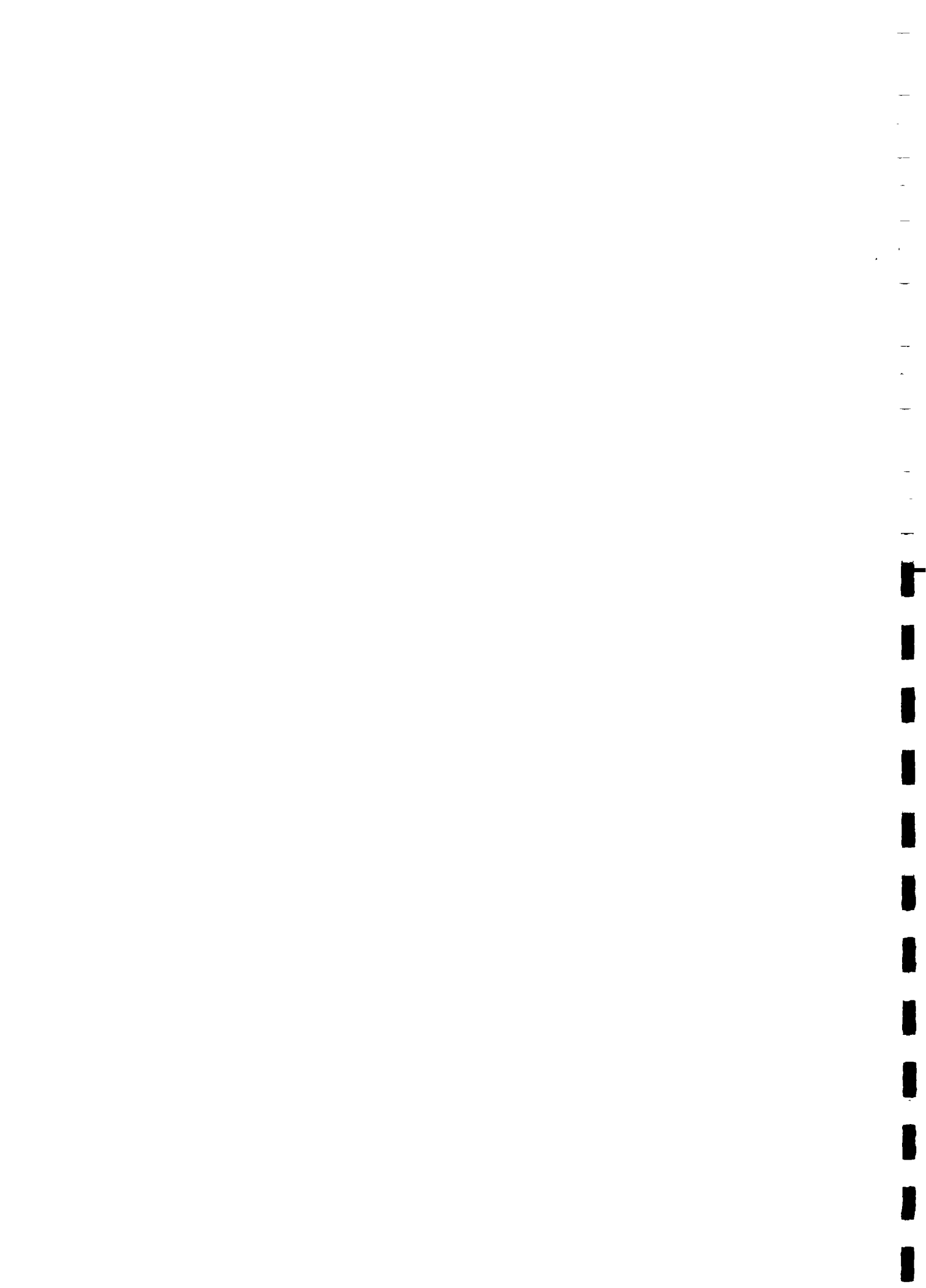
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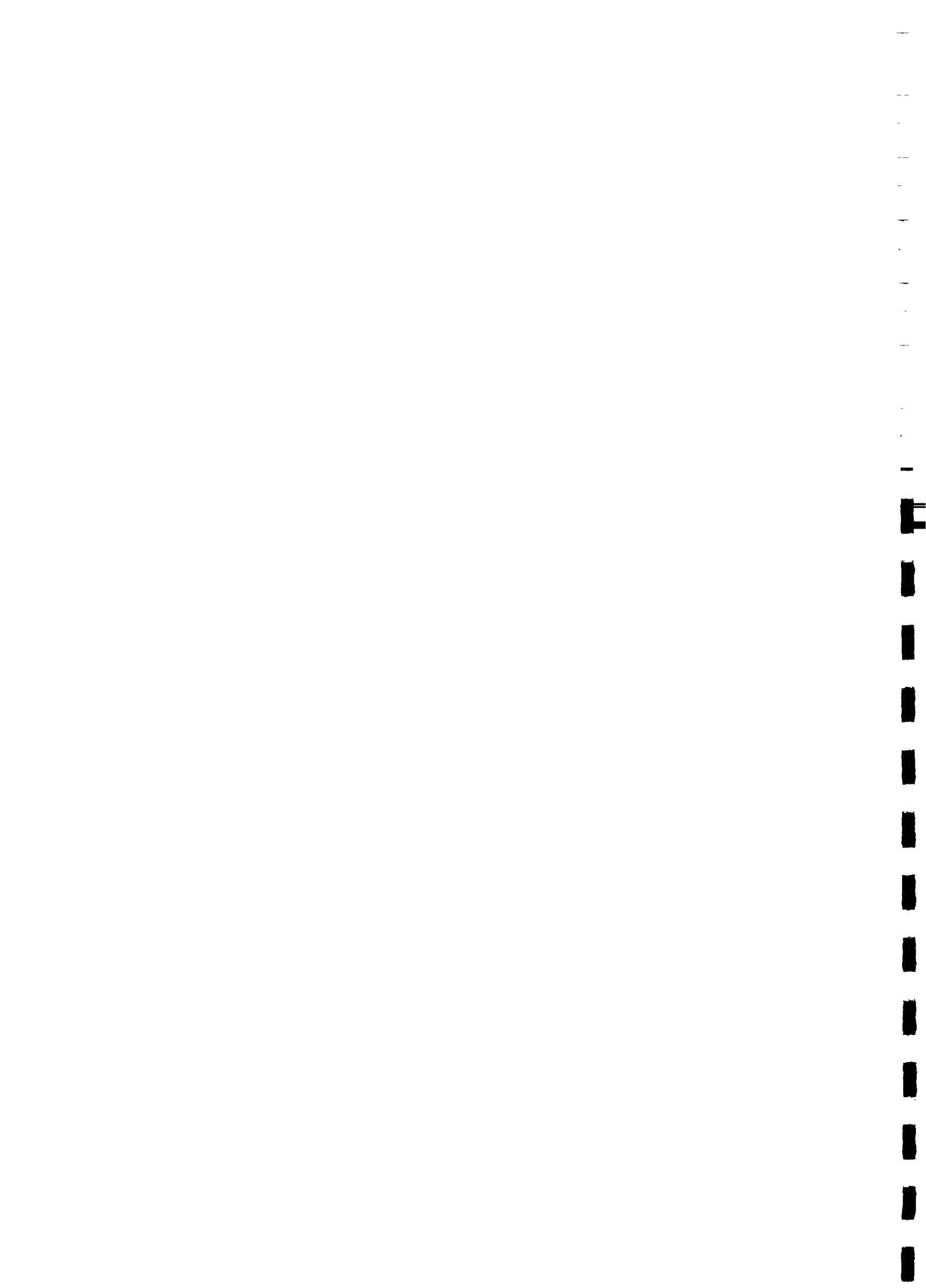
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1. Daily Activity Schedule



Part I Background

Part I of this Report aims at providing background for the proposed project and its design. It first gives an overview of Aral Sea Environmental Disaster in Kazakstan; affected areas and socio economic impact of the crisis. Then, it presents an overall picture of existing water supply and sanitation condition together with resulted adverse impact on human health, well being and the living conditions. Having depicted the existing institutional framework to deal with water supply and sanitation, it finally discusses main issues that have to be addressed in implementing the proposed project.



1. Environmental Disaster in Kyzl Orda Oblast

1.1 Aral Sea Environmental Disaster

The accumulated adverse impact of the development activities undertaken during last three decades has led Aral Sea Region towards one of the most serious environmental disasters ever experienced by mankind. This crisis has now reached catastrophic dimensions.

Over the past 34 years, the sea has steadily shrunk as a result of a huge reduction in inflow from its two tributaries, the Amu Dar'ya, caused primarily by rapidly increasing use of water for irrigation of cotton, rice and other food grains, and fodder. In the aggregate, the area of the Aral Sea Decreased by 52% from 69,000 to 33,000 km² and its volume fell by 74% from 1083 to 277 km³ between 1960 and 1993. The environmental and economic consequences of the Aral's desiccation have been wide-ranging and severe.

Once dried up, the former sea bottom turns into sand or clay deserts, from which frequent winds and storms carry salts and dusts to nearby fields and settlements, causing additional salinization of lands and affecting human health. The shrinking of the Aral Sea also resulted in a change in climate towards more continental conditions, with longer and colder winters and hotter, drier summers. These changes directly reduce the agricultural potential of the Region as a cotton producing area.

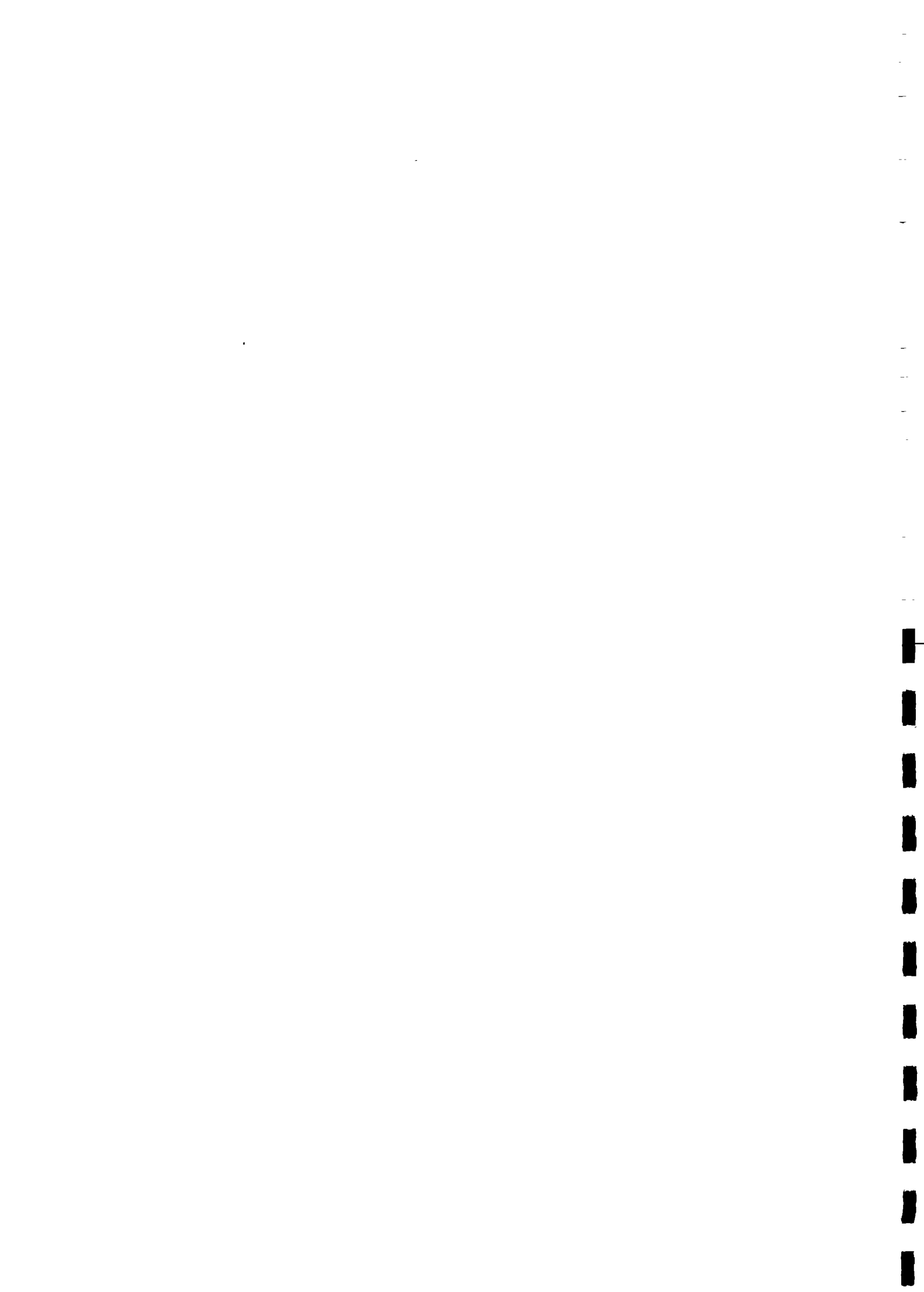
Due to increasing salinity and pollution, the Sea's fishery was destroyed by the early 1980s. The ecosystems of the deltas of the two tributaries have suffered from spreading desertification, severely reducing stream and ground water levels, and increasing soil salinity. Traditional reed swamps and tugay forests have almost completely disappeared.

1.2. The affected areas in Kazakhstan

The Aral Sea environmental crisis affects two administrative territories in Kazakhstan.

1. The Akt'ubinsk Oblast (Province)
2. The Kzyl-Orda Oblast

The South eastern part of the Akt'ubinsk oblast that is located in the Aral basin is a desert with no permanent population and hence be excluded from the proposed project.



The Kzyl-Orda Oblast (provincial capital Kzyl Orda) covers 228,000 km² and has a population of 598,000. It occupies the Syr Darya delta and the lower and middle parts of the Syr Darya valley. The northern and eastern coasts of the Aral Sea lie within this province. Within the oblast, two districts, Aralski and Kazalinski, are immediately adjacent to the Sea and are hit hardest by the crisis. While in 1989 the districts' population was 70,804 and 71,651 respectively, continuing outmigration in recent years may have reduced these numbers by 10-15%.

2. *An overview of the affected Areas in Kzyl-Orda*

Between 1979 and 1989 the total population of every territory in the Aral Region has grown considerably. Kzyl-Orda's population increased by 15%, 2% more than the national average of 13%. Recent demographic studies suggest, however, that the province's population has actually decreased since 1989 due to outmigration. In 1993, the oblast had a negative migration balance of 7,100. Unemployment in the province is rising: it increased by 0.5% between 1992 and 1993, and is predicted to reach a total of 7,200 persons (1.2%). The basic information of the province is summarized in **Table 1**.

Approximately thirty five percent of Kzyl Orda's population lives in urban areas. In the Aralski district, roughly 40% of the population lives in the capital of Aralsk, and 60% in rural areas. The figures for Kazalinski are 30% and 70% respectively. The dominant sizes of rural settlements in Kzyl-Orda are 11-25 persons (22% of all settlement; mainly small family communities) and 500-2000 persons (19% of all settlements; mainly collective farms). An average rural family in Kzyl-Orda has 6.3 members.

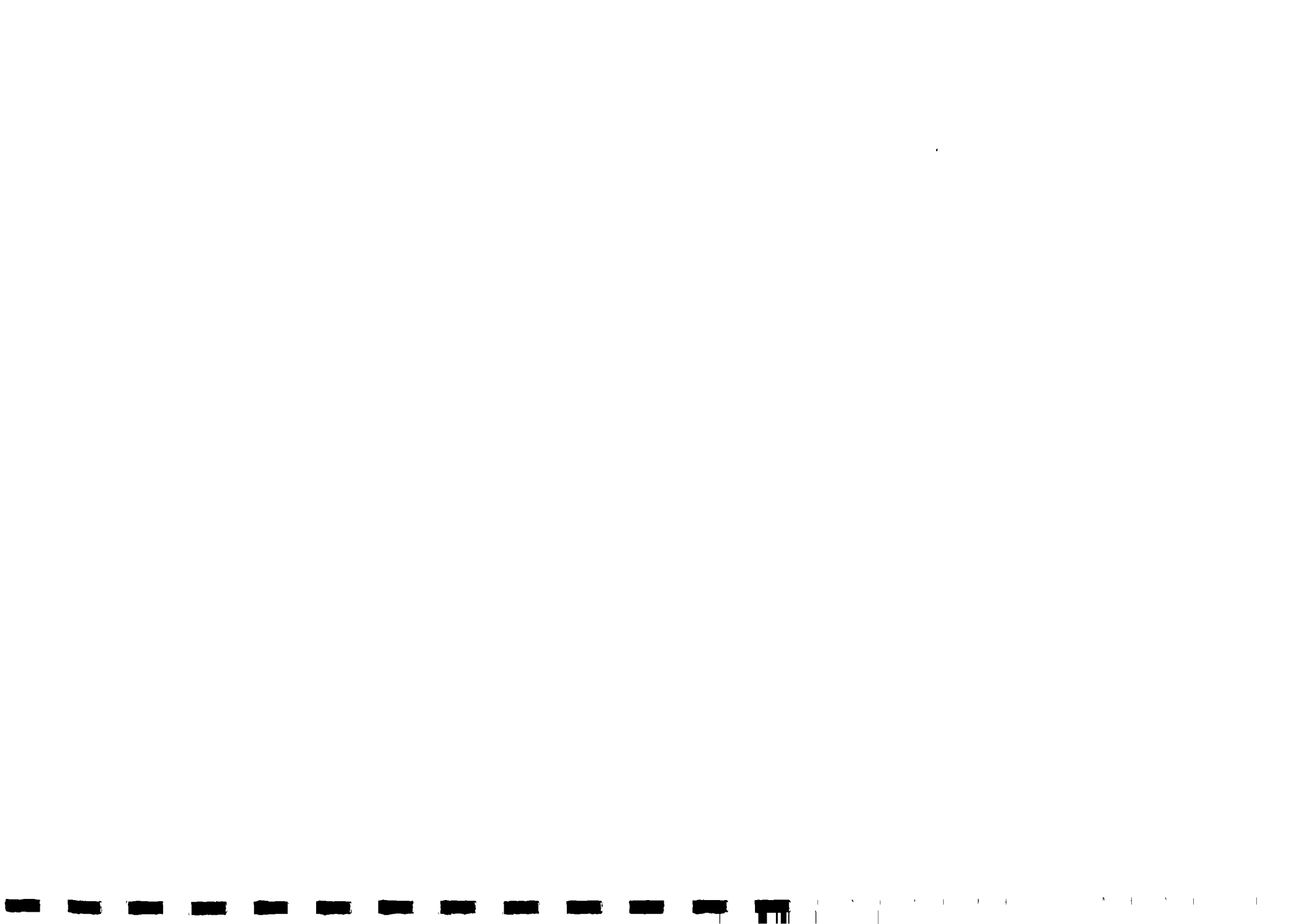
Kzyl-Orda is not as ethnically diverse as Karakalpakstan, its southern neighbour. Kazakhs (79.4%) clearly dominate as ethnic group. They populate the northern Aral Sea Coast, and the Syr Darya delta and valley. They also constitute the sparse nomadic population of the Ust'urt and Kyzylkum deserts (in Kzyl Orda and Karakalpakstan). The most important minorities in size are Russians (13.3%), Koreans (2%), and Ukrainians (2%). They live mainly in the central and southern parts of the province and around Kzyl-Orda city. However, since 1989, many Russian and Ukrainians left the area. No reliable figures are available to estimate the magnitude of this exodus. Also, it is unclear, to what extent these migration movements were connected to the Soviet break-up, and to what extent to the deteriorating living conditions in the Aral Region.



**Table 1:
Basic Information of Kzyl Orda Oblast**

Description	Amount	Remarks
Total Population	598000	1989
Land Area	228000	per sq. km.
Growth Rate (Natural)	21.9	1989 figures
Birth Rate	28.7	(1989 figure per thousand)
Infant mortality	30.7	- do -
Urban Population (%)	65.0	% 1989 figures
Rural Population (%)	35.0	- do -
Ethnic Composition		
* Kazakhs	79.4	-do-
* Russins	13.3	-do-
* Others	7.3	-do-
Average size of rural family	6.3	1979 figures
Net out migration	-7180	(1993)
Population of main Cities		
* Kzyl Orda	165,300	1989 Figures
* Aralsk	70,804	-do-
* Kzalinsk	71,651	-do-
Highest Recorded population (peak)		
* Aralsk	79,200	1979
* Kzalinsk	80,900	-do-
Lowest population after the peak		
* Aralsk	70,300	1987
* Kazalinsk	71,600	1989
Administrative division of Kzyl Orda		
* Rural District	18	
* Towns	4	including Kzyl Orda City
* Individual Settlement	11	
* Rural and Urban Community	97	

Originally, Kazakhs in Kzyl-Orda were organized in fishing communities along the Sea and river arms. Some small tribes remained pastoral nomads. During the Soviet period, the vast majority of these groups was turned into cotton and rice farmers. This brought dramatic changes for Kazakhs, who until then had no knowledge of this kind of economic activity and corresponding life-style. During the late socialist period (1970-early 1980s) the traditional tribal and clan differentiation among Kazakhs was partly re-vitalized. Informal social leaders gained influence in organizing social and economic activities in their communities. Today, the rural population of Kzyl-Orda, especially in the two districts closest to the Aral Sea, mainly lives in town-like collective farming communities, with



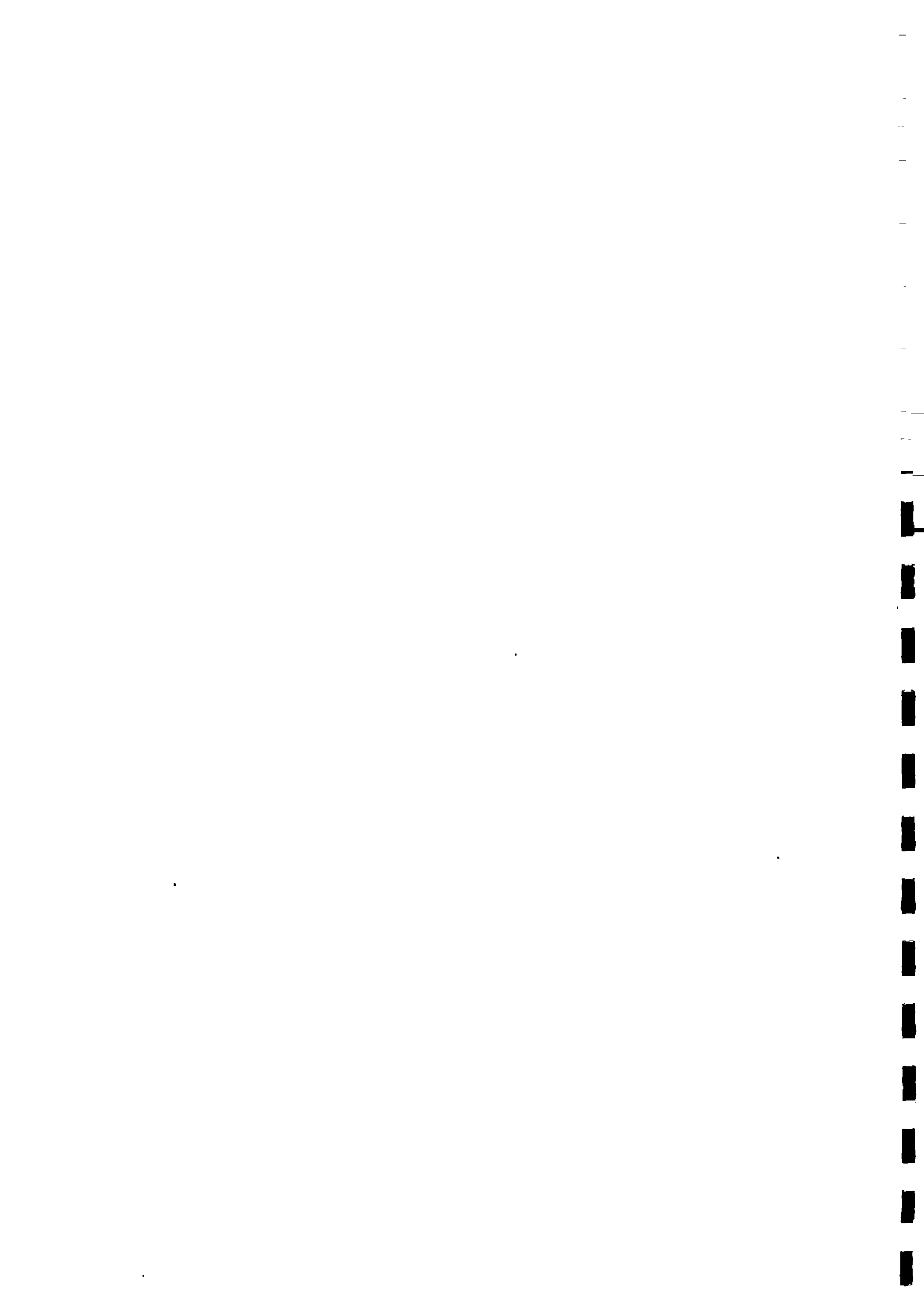
up to 2500 inhabitants. Due to this "semi-urbanization" and a relatively high exposure to Russian influence, Kazakhs in Kzyl-Orda are much more "modernized" than their southern Karakalpak, Uzbek and Turkmenian neighbours.

3. *Socio-economic effects of the crisis.*

The Aral Sea crisis caused serious economic problems in the area. The Aral Region includes some of the poorest oblasts and districts of the respective countries. In the early 1990s, per capita income was 2-3 times below the average poverty level for Central Asia. Tentative approaches to quantify overall economic losses in the Region due to the ecological crisis, based on sums required to ameliorate the situation, produced an estimate of 30 billion dollars. Economic losses occurred mainly due to disappearing opportunities for fishing and shipping, reduced agricultural yields and the necessity for more cash-intensive growing methods, increasing human health expenditures and reduced human labour potential, and loss of tourism. In Kzyl-Orda, economic losses in the last 30 years were estimated at 3 billion dollars. These losses were mainly a result of the decline in natural resources and subsequent loss of employment. Commercial fishing and shipping in the Aral Sea was abandoned in the mid 1980s. The oblast's two major factories (fish-processing and pulp and paper) now had to switch to expensive, imported raw materials as inputs after the disappearance of local fish and reed. Also, agricultural output in the Syr Darya delta and valley declined by 20-30%, a direct result of soil salinization (saline irrigation waters, groundwater, wind), climate changes, and reduced labour efficiency due to health problems. More and more chemicals were needed to maintain a certain output level, leading to economic inefficiencies and further ecological deterioration of arable lands.

The health of the population living in the Aral Sea basin has deteriorated significantly as a result of the ecological crisis. Highly mineralized and contaminated drinking water (pesticides, microbes), air pollution (salt, pesticides) and unsafe food (pesticides) are the main reasons for this phenomenon. The situation is aggravated by poor medical services and sanitation. As a result, general morbidity in the area has increased by 300% between 1985 and 1989, and child mortality rates (around 85 per 1000) are among the highest in the world. In Kzyl-Orda, the main diseases that can be directly or indirectly related to the ecological degradation of the Region, are infectious hepatitis, typhoid fever, anemia, gullet and liver cancer, and intestinal problems caused by salmonella. In recent years 40% of hepatitis and 45% of typhoid cases of Kazakhstan were recorded in Kzyl-Orda. During the last 15 years, the occurrence of hepatitis in the province has risen by 7 times, of typhoid fever by 29 times.

Over the same period, salmonellosis in the Aralsk district became 5 times more widespread in towns and 12 times more frequent in rural settlements. One of the



main direct reasons for the poor health condition of the oblast's population are insufficient water supply and unsafe water quality. In a recent quality check of piped water (supplying 65% of the population), 40% of all samples were not meeting the standards for drinking water. In rural areas, many households don't have enough water to keep animals or grow vegetables for home consumption. As a result, the nutritional intake of the Oblast's population is substantially below the normal requirements, especially for vegetables and vitamins. Aside from water quality, food quality is a major problem. In a 1991 study, pesticides were found in every second food sample, and exceeded the maximum acceptable level in every 7th sample.

The ecological crisis has also caused many social and cultural problems, making it virtually impossible for many locals to maintain certain aspects of traditional life style. Increasing soil salinity and the disappearance of forests and reed swamps forces local groups to abandon traditional construction materials and styles. With the disappearance of fish, a major part of population's diet, people in the delta areas were forced to completely change their traditional diets. Former fishing communities along the lake had to adapt to new occupations and living environments.

Another consequence of the ecological degradation of the area is an increase in migration levels within provinces and to other areas. Within Kzyl-Orda, for example, the disappearance of fishing, unemployment and lack of safe drinking water has forced people to migrate from the coastal towns and settlements to "urbanized" rural communities or towns further east, in the Syr Darya delta and valley. Between provinces, migration occurs most frequently among Russians (leaving for Russia) and Kazakhs (leaving Karakalpakstan and migrating to Kazakhstan). In 1992, 8,700 people arrived in Kzyl-Orda, while 15,800 people left the province, giving on overall migration balance of 7,100. The equivalent figure for 1993 was 3,600. Based on these figures, real outmigration has doubled between 1992 and 1993. As mentioned above, to some extent these migration activities may be politically or ethnically motivated. However, since there are still no noticeable ethnic tensions in the province, environmental degradation and subsequent economic hardship can be considered the main reasons for increasing migration movements in Kzyl-Orda, especially for outmigration tendencies away from the Aral coast and out of particularly disadvantaged rural areas.

It is not easy to determine who is suffering the most from the negative effects of the Aral Sea crisis. First of all, apart from the coastal areas, it is extremely difficult to geographically identify ecological "hotspots" or especially disadvantaged areas. Generally, marginal areas around oases (where irrigation channels usually end and the problems of either lack of water or waterlogging are most prominent), and areas where water supply was based on groundwater that has now been depleted or turned saline, experience disproportionate hardship.



However, these locations are randomly spread over the Region, and are often situated next to ecological more or less adequate areas. In most cases, local field studies are necessary to pin down areas where remedial action is needed most. In terms of social/professional groups, people previously employed in the fishing and shipping industries are hit hardest, followed by farmers living in one of the above mentioned disadvantaged areas and cattle farmers in general (who suffer from the decertification of pastures). Based on ethnic differentiation, Kazakhs and Karakalpakhs, who made up virtually the whole fishermen community in the Region, and who historically occupy the rim of oases, seem to be worse off than others.

4 Existing Water Supply Conditions

4.1. Historical Context

The water supply and sanitation situation of the project area can be summarized into three main phases in historical perspective.

a. Traditional Era - Before 1960.

During this long period of well established harmony between man and nature, the semi-nomadic populations of Kyzyl Orda enjoyed access to safe drinking water, while the towns were able to use nearby springs and wells.

b. Beginning of Aral Sea disaster 1960 -1970

With the introduction of extensive large scale agricultural development, degradation of environment had started showing symptoms of the associated desertification such as salinization of the ground water, the loss of the pasture lands, forests and sources of spring waters. In the 1960s when water quality in the Syr dar'ya was good, water was taken from the river at a point close to the community. The rapid deterioration in the river water quality has forced the construction of a major regional water supply scheme. However, the new scheme does not extend to all communities. Those uncovered and those who are provided with but an extremely unreliable system still rely on the old, often unsafe, supply arrangements.



As the Aral Sea crisis peaked, the semi-nomadic way of life has disappeared as pastures and fresh waters became extinct.

c. 1980-1990 - The period of special attention by USSR

By the 1980s, the central USSR government and respective national Supreme Soviets passed various resolutions to give priority to meeting the needs of populations in the disaster areas. In the Kyzl Orda province, in the late 1980s substantial financial resources were used to ameliorate some of the short term needs by increasing the usual budget allocations of the province by three times. By 1988 special coefficients to salaries were introduced to raise incomes. During the same period, the water supply to the Kyzl Orda town, five district centers and 80 collective and state farms were reconstructed or newly constructed. These new or renovated systems relied on ground water. Some 260 new artesian wells and 365 kilometres of water pipes were installed for this purpose.

4.2. Existing Water Supply Situation

In summary, access to water is very limited and water quality is poor. Inadequate maintenance of the system and high levels of leakage, the rapid deterioration of the quality of water from the existing wells, and harsh climatic conditions have contributed to the severe deterioration of the existing system. At the same time, large numbers of communities are still unserved except through occasional delivery of water transported through trucks. The treatment facilities are largely lacking and the pumping stations are either severely damaged or not functioning as a result of shortages of spare parts. Currently, water is in short supply everywhere and the quality is universally poor throughout the disaster region and in the Kyzl Orda province at large. The populations expect the situations to further deteriorate during the winter months when pipes freeze and the shortage of gasoline, coupled with lack of cash in the hands of the state farms as well as the affected families will impede the distribution of drinking water through trucks and tractors.

The existing water supply system, especially in the rural areas and state farms does not provide house or yard connections; rather people queue in the streets where taps are placed about every 150 meters to fill their buckets. Because the supply is limited to about an hour a day (under the current energy saving policies)



the amount of water each family can fetch is restricted to about 100 litres or 15 litres per person. This may be supplemented by well or river water for purposes of cleansing, laundry, etc. The lack of yard connections also hindered households' ability to provide water for the domestic animals, especially during the winter times, and to grow some vegetables for home consumption.

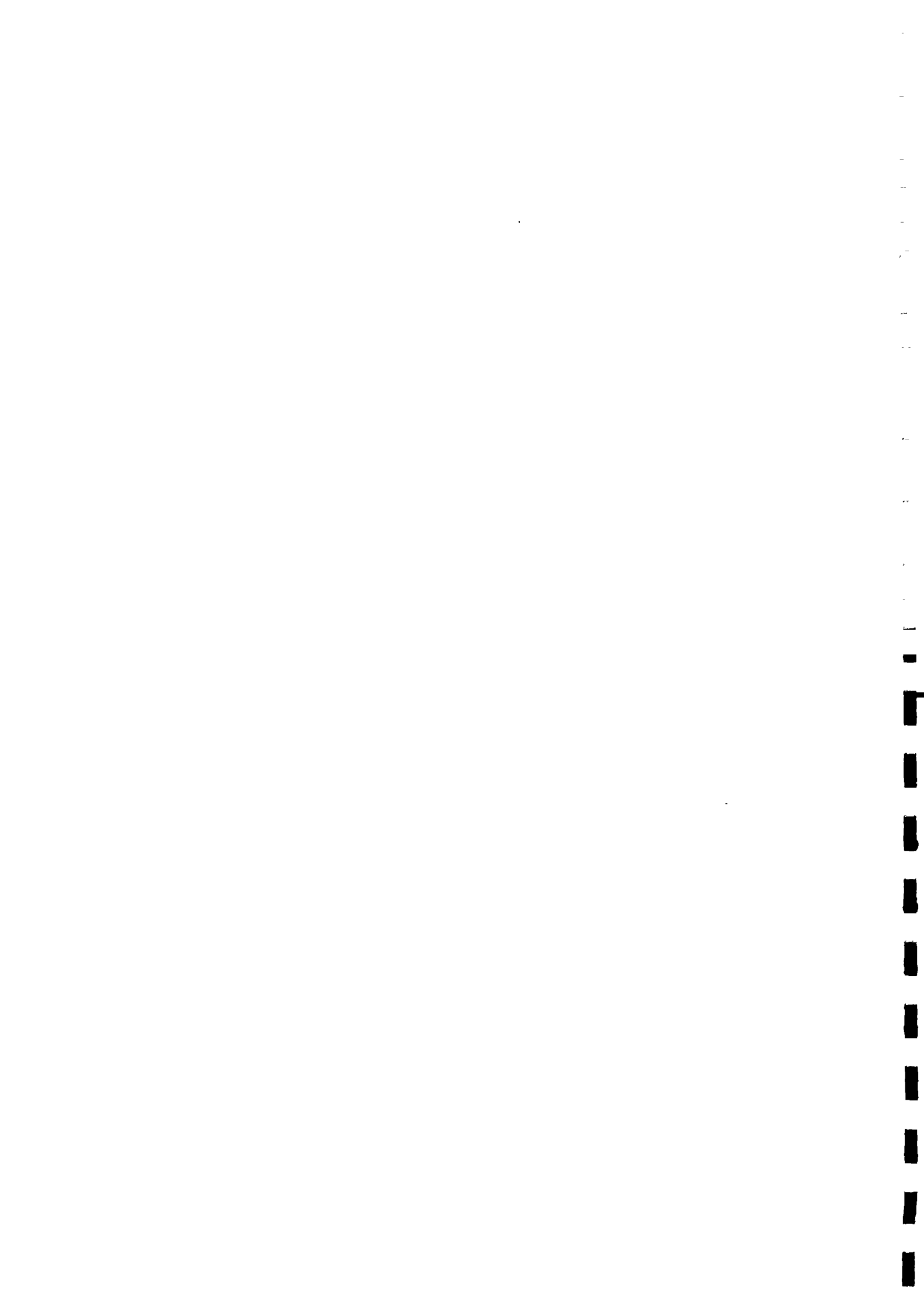
Several coping mechanisms are used to deal with inadequate and poor quality water. These consist of boiling water and drinking it as tea rather than as plain water; severely reducing the already low level of water consumption and making further sacrifices in cleanliness and sanitation; using rivers and other open sources of water despite knowledge of their pollution; using the highly polluted hand-dug wells in home gardens; paying exorbitant prices to vendors; or walking long distances in search of alternative sources of water. The costs in monetary, labour and health terms are extremely high.

5. Existing sanitation condition

The main problem of sanitation in the region is human excreta disposal. Nearly everywhere apart from large apartment buildings and communal buildings unventilated pit latrines are used. If the pit is full, usually another new one is dug. Because of the high groundwater levels the human excreta's bio mass is in direct contact with the groundwater, thus bacteriologically contaminating the groundwater. Because of the horrendous state of the pipe system for drinking water and because of the intermittent pressure in this system the potable water is the next to be contaminated. This situation can be improved in many ways but the economically most viable way is the construction of elevated lined and ventilated twin pit latrines, using local labour. Personal hygiene remains an important factor in sanitation but due to over

BOX 1: Existing Water Supply Condition in Aralsk Reyon

- a) Aralsk Town. Only 35% of the 6326 of the end of 1994; 16% (i.e. 1006 households) received water from taps located up to 500 meters away, and 49% (i.e. 3101 households) did not have access to the water distribution network. They must depend on private water carriers and natural phenomena, such as rain and snow
- b) Rural areas near Aralsk Town
There are 21,956 people (4087 households) live in 16 settlements and account for 50.5% of the region's rural population. They get water from the Aral-Sarybulk water pipe, which is of apparently high quality.
- c) Lower Sur Darya In the lower Sur Darya region, there are 9,993 people (1795 households) in 30 settlements who account for 23% percent of the rural population. They have to use water from Sur Darya which is heavily polluted with chemicals.
- d) Remaining areas The 11,553 people (in 2019 households) have no direct access to water. They use artesian wells and have reservoirs formed to capture snow and rain. They also have some water carrier service by AWP&SD or private vendors.



exposition to unrealistic propaganda the means of reaching the target population have to be much more up to date and more realistic than the classical poster of a mother washing fresh vegetables under a tap in an area where there is an enormous shortage of vegetables and where the tap water is contaminated.

The only sewers in the Oblast are located in Kyzyl Orda city. The most common form of sanitation is the unlined pit latrine. These are generally constructed by each household with not particular sitting or sizing guidelines being used. They are not ventilated. In some urban areas flush toilets discharge into unlined pits, providing a serious risk of aquifer pollution. The extremely poor state of sanitation not only poses direct risks to human health, but also degrades the environment. It is therefore important to understand the factors associated with cultural patterns of cleanliness and map out a strategy through which sanitation improvements may be piloted. The social assessment effort will, therefore, address these issues as well.

6. *Overall Health Condition*

Overall Health Condition of the people is poor as evidenced by high percentage of water borne diseases such as typhoid, paratyphoid, viral hepatitis and dysentery.

Bad infant health is particularly prominent in rural areas in Central Asia. The main diseases are waterborne diseases in summer, respiratory diseases and anemia in winter. The main causes are in order of importance: poverty and poor living conditions leading to a.o. malnutrition; unsafe drinking water; lack of adequate rural waste disposal and, human excreta disposal; and poor personal hygiene (exacerbated by the lack of water and its poor quality). Anemia and nutritional deficiencies, particularly vitamins A and C and animal protein, are widespread and appear to affect mothers and children most severely. Infant mortality and morbidity caused by acute diarrheal diseases and hepatitis-A- perhaps the best indicator of poor water supplies - were consistently high throughout the region.

Existing health conditions and its relationship between existing water supply and sanitation conditions as well as low level of hygiene education and associated poor hygiene practices is depicted in **Figure I**.

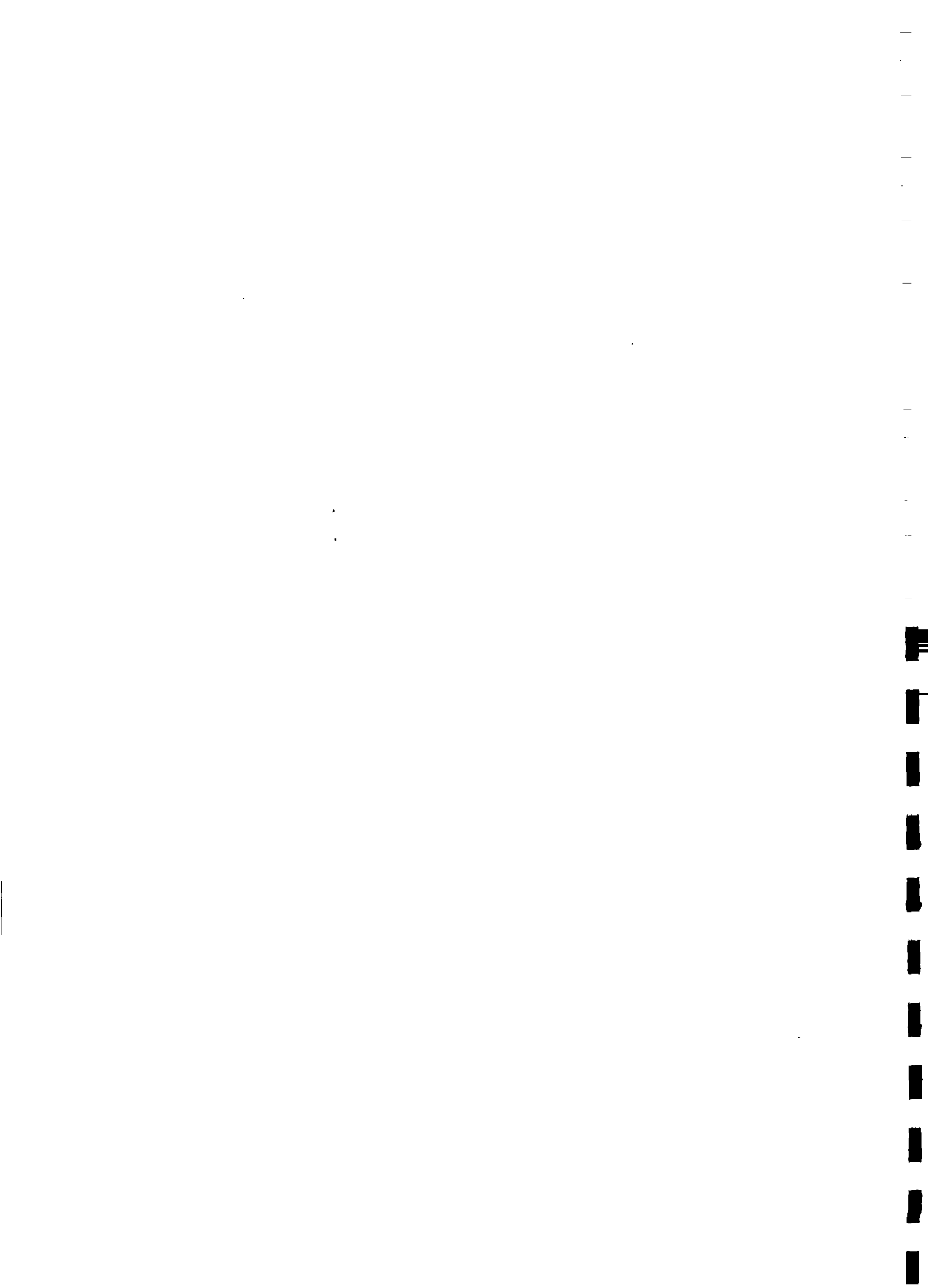
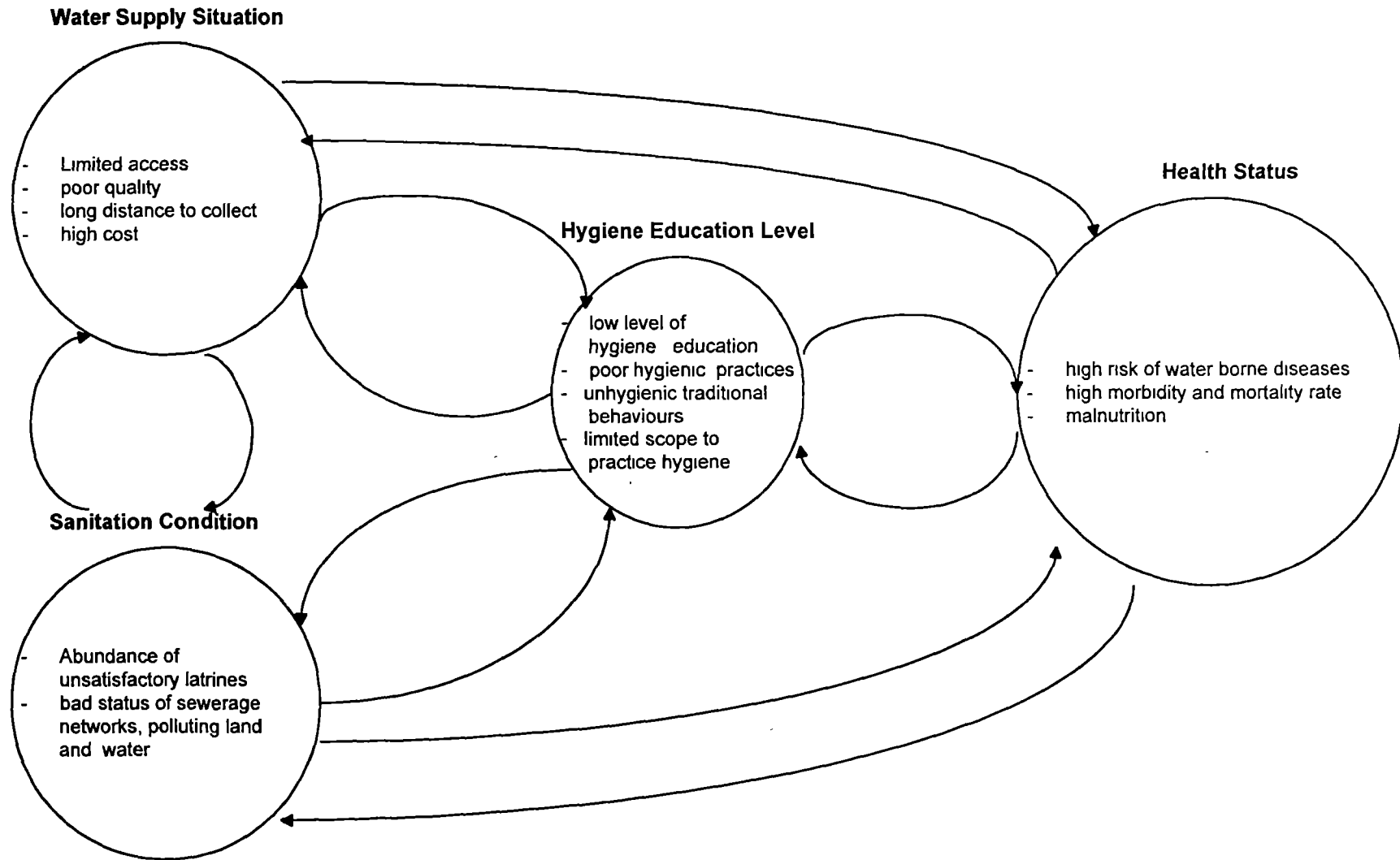
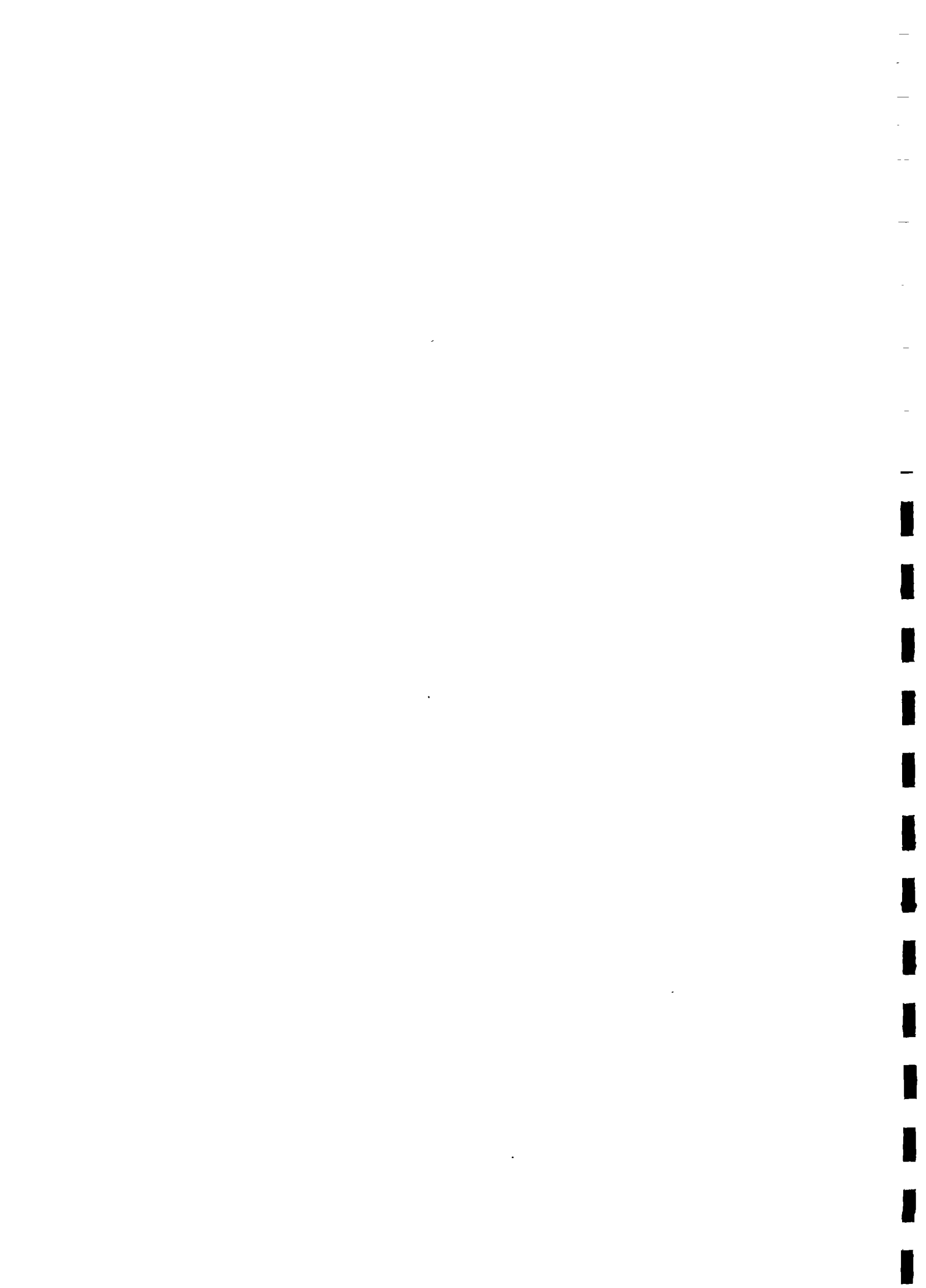


FIGURE I
Inter Relationship between Health Status and
Water Supply and Hygiene Education Level in the Project Area.





7. *Institutional framework dealing with water supply and sanitation.*

At National Level the following institutions play an important role in the water supply and sanitation sector.

a. **State Committee for Water Resources. (SCWR)**

The State Committee for Water Resources of the Republic of Kazakhstan (Goskomvodresursy) with broad water resources management responsibilities, plays both a policy-making role and an operative role for the water resources sector. Regarding the water supply sector, it is responsible for the design, construction and operation of inter-regional water transmission pipelines for drinking and industrial purposes. There are several state-owned and joint stock companies under its authority, including the Project and Construction Enterprise Kyzl Orda Agricultural Water Supply (Selkhozvodoprovod), which is responsible for the construction and operation of the Aral Sarybulak Pipeline.

b. **Ministry of Housing and Communal Services (MHCS)**

This Ministry has the primary responsibility over all housing and urban matters, including water supply and sanitation policies and programmes. The MHCS first designates responsibilities for water supply and sanitation services at the Oblast level to the Oblast Committee on Housing and Communal Services. The Committee, in turn, entrusts responsibility to the Local Administrations of each Raion. The Local Administrations have direct control over line departments, and supervise water and sewerage companies (Vodkanals) in urban areas. Concerning the project area, the MHCS relies on the Kyzl Orda Committee on Housing and Communal Services, which in turn designates responsibility to the Local Administration of Kazalinsk and Aralsk Raions for all water supply and sanitation matters.

c. **Ministry of Health (MH)**

The ministry of health through the Department of Sanitation and Epidemiology has responsibility for monitoring drinking water quality standards, ensuring sanitary conditions of water supply systems, controlling epidemics, as well as for the development of sanitation and hygiene education. As in the previous case, the department of Sanitation and Epidemiology branches out to the most peripheral levels, e.g., to the Oblast and the Raion level. Regarding the project area, there are Sanitary



and Epidemiology Stations (SES) in both Aralsk and Kazalinsk Raions, which are responsible for; (i) the conditions of water supply system; (ii) the inspection of water supply systems; and (iii) the ensuring of good living conditions to the population. More specifically, the SESs are responsible for monitoring drinking water standards, which correspond to those of the former Soviet Union, in both urban and rural settlements.

A National institutions perform their duties through a vast network of Oblast administration.

At Kyzyl Orda Oblast level, following institutions deal with water supply, sanitation and health as discussed above .

- a. Kyzal-Orda Committee on Housing and Communal Services.
- b. Selkhozvodoprovod
- c. Kyzyl-Orda Anti Monopoly Committee

At Raion level, local administration deals with water supply and sanitation. However, the following agencies play an important role specially in operating and monitoring of water supply and sanitation.

- a. The Aralsk and Kazalinsk Vodokanal (Water canalization and sewerage companies)
- b. Units of joint stock companies - Kazalinsk agricultural water supply. i.e Repairing and Maintaining Organizations (No. 1) in Aralsk Raion and Repair Maintenance Organization (No. 2) in Kazalinsk Raion.
- c. Sanitary and Epidemiology Stations in Arals and Kazalinsk.

Overall administrative structure to deal with water supply and sanitation in the project area is illustrated in **Figure II**.

8. *Issues to be addressed.*

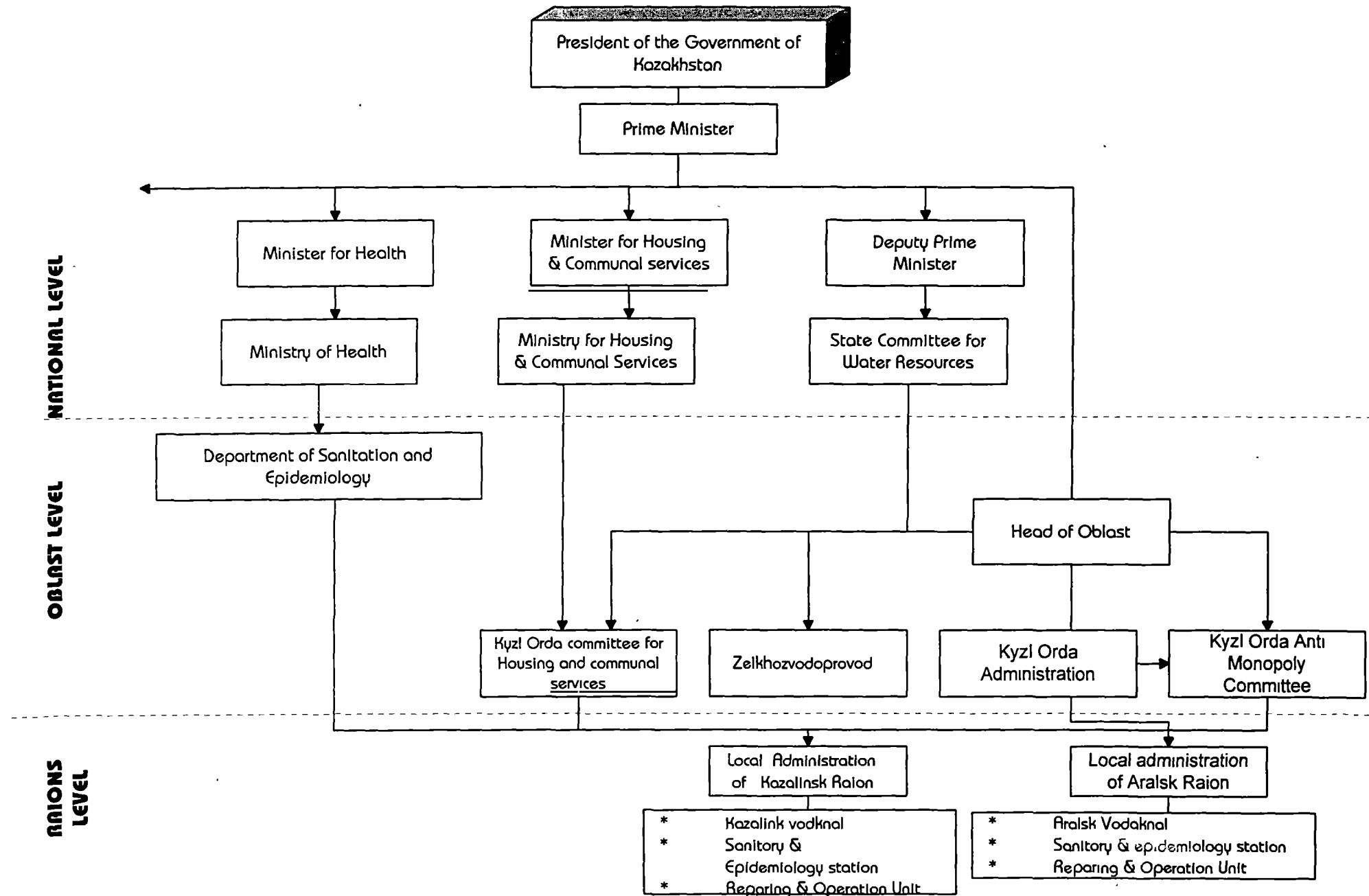
8.1. Institutional Issues

The institutional structure dealing with water supply sanitation in the project areas is quite complex and has become more complicated with the changes introduced time to time in order to adjust to the new socio-economic and political environment of the country.

In summary, the following institutional issues and components have been identified.

*Existing Institutional Structure to deal with
Water Supply and sanitation in Project Area*

FIGURE II





- a. Overlapping responsibilities of the administrative set-up
- b. Lack of experience in implementing foreign aided projects
- c. Limited absorptive capacity in utilizing foreign aid.
- d. Communication barriers to be faced with when implementation of World Bank Projects.
- f. Intrinsic weakness in the existing bureaucratic administrative system inherent from the close and command administration of the former USSR.
- g. Widespread corruption, disorganization and inefficiency in existing bureaucratic system.
- h. Influence of traditional approach of the central planning and top down approach/ no experience in bottom up - community based or rolling over flexible planning
- i. Widespread demoralization of officials due to low wages and non payment of salaries.
- j. Traditional habit of providing free services to the nation.

Overall Kazakhstan administrative set up is now in the process of transition, and hence at the moment, is in a state of confusion and uncertainty. Therefore, it is the institutional factors which have emerged as the most critical in the implementation of the proposed project. In this regard following main problem areas where urgent attention is needed have been identified.

- a. Lack of technical and institutional capacity of existing agencies to implement cost effective, efficient and self sustained water supply schemes.
- b. Need to increase the level of community (or beneficiary) participation.
- c. there is a severe lack of capacity for implementation of community based rural water supply and sanitation programs and in general implementation of donor funded time bound projects and programmes.

Therefore, a new institutional framework needs to be established to implement the project activities and to attend inter agency coordination vertically and horizontally while focusing on much attention on capacity building and strengthening of existing agencies in the field of water supply, sanitation and Health.



8.2. *Technical issues*

Water supply systems in Kazakhstan are suffering from a range of technical deficiencies. Some are listed below, however further study is required to get a good overview of the weightage and severity of each of these deficiencies.

Many schemes employ sophisticated technologies which in the present socio-economic and environmental circumstances are not viable. Rehabilitation and the design of new schemes should therefore focus on utilizing local resources and capacities in staff, construction materials and skills, spare parts, chemicals and energy. By favouring more appropriate design standards greater effectiveness and sustainability can be achieved.

Technical standards should furthermore be attuned to meeting the requirements of the population in an affordable manner, providing the optimum service level with respect to the investment and recurrent cost required. The skills required to maintain and manage the scheme are crucial and no scheme should use technologies that can not be handled by local staff. At present, low operational efficiency leads to low levels of service while inappropriate design specifications are also reducing the effective functioning of water supply facilities.

Poor maintenance of the piped schemes and inadequacies in sewerage and drainage further cause wastage and pollution. The latter needs to be contained urgently in order to ensure that the limited quantities of water produced also reach the consumer.

Further investigations are needed during the pilot implementation phase to categorize the various technical issues and to suggest appropriate measures for improvement and correction. These studies will further be helpful in establishing appropriate standards for the design of new water supply schemes.

8.3 *Willingness and affordability to pay and cost recovery.*

Until the recent past, water was a "free good". However, after the construction of the new scheme in the region, the water agency functioned independently and until recently, exercised some discipline for payments. In the rural areas, the water payments were made directly by the state farms and were subtracted from expected earnings of the households. Currently, many state farms are bankrupt and cannot pay for water. When water supply of these farms are cut off, the families are forced to make personal arrangements, often with the state farm, to pay directly of water delivered through trucks. For these services, the average payments range from 35-50 tenge depending on the distance of home from the



water source. These modes of payment have created, although painfully, the realization that households ought to pay directly for water and there is high willingness to pay for services, if provided. The high levels of willingness to pay is also matched by revealed preferences as already noted. In the urban sector, payments for water are made directly by the households: Those in rental quarters pay for utilities as part of the rent and others pay it as part of the municipal services. Thus, in both the rural and the urban sector, water is no longer a free good and in some cases actual water payment constitutes a substantial portion of the income.

The fact that charges are made for water does not necessarily imply that households are able to pay and do pay. Nor does it mean that those who are unable to pay are deprived. In the state farms, since it is legally the administration's responsibility to pay for water, those who cannot pay for vendors are provided with water "credit". Since most households have not been paid a salary for almost a year, their inability to pay for water and the willingness of the state farm administrators to have some water transported to these homes is understandable. The modalities through which water agency tackles the issues of default in the urban sector is unclear.

Socio economic studies undertaken recently revealed that though the tariff for piped water is 2 tenge per cubic metre, the cost of the water delivered by tanks is about 66 tenge per cubic metre; families who make their own arrangements pay 186 tenge per cubic metre. Thus, although few respondents (25%) indicated a willingness to pay 1,000 tenge to improve their water supply systems, those with limited access are already paying high prices for water, very little of which goes to maintain the system.

Prevailing distorted tariff structure is neither rational nor practical and hence it needs a complete revision.

8.4 Operation and Maintenance

Operation and maintenance of existing facilities is, in general, unsatisfactory due to lack of funds and institutional problems and prevailing unsatisfactory operation and maintenance situations is threatening the sustainability of existing facilities. A series of problems connected with disintegration of USSR such as return of top layer of Russian Engineers, lack of spare parts and chemicals, withdrawal of former support received from Russia, non availability of cheap energy, frustration among staff members etc., have attributed to aggregate operation and maintenance problems. A combined effort involving technological, financial and institutional solutions is required to address these issues.



8.5 Service Standards.

Service levels in many rural and urban areas are not satisfactory. In most cases water supply is limited to a few hours per day. The quality of water is poor in general. In rural areas and state farms where no yard connections are provided, people have to be in queues at the street taps located about 150 meters away to fetch their own water. Most of stand posts have gone out of order and hence some people have to travel long distances for their domestic water; or have to make their own arrangement to obtain water through water trucks.

Improving service standards have to be done carefully considering all the factors, not only the technical, but also socio economic and institutional including affordability and willingness to pay for improved water services.

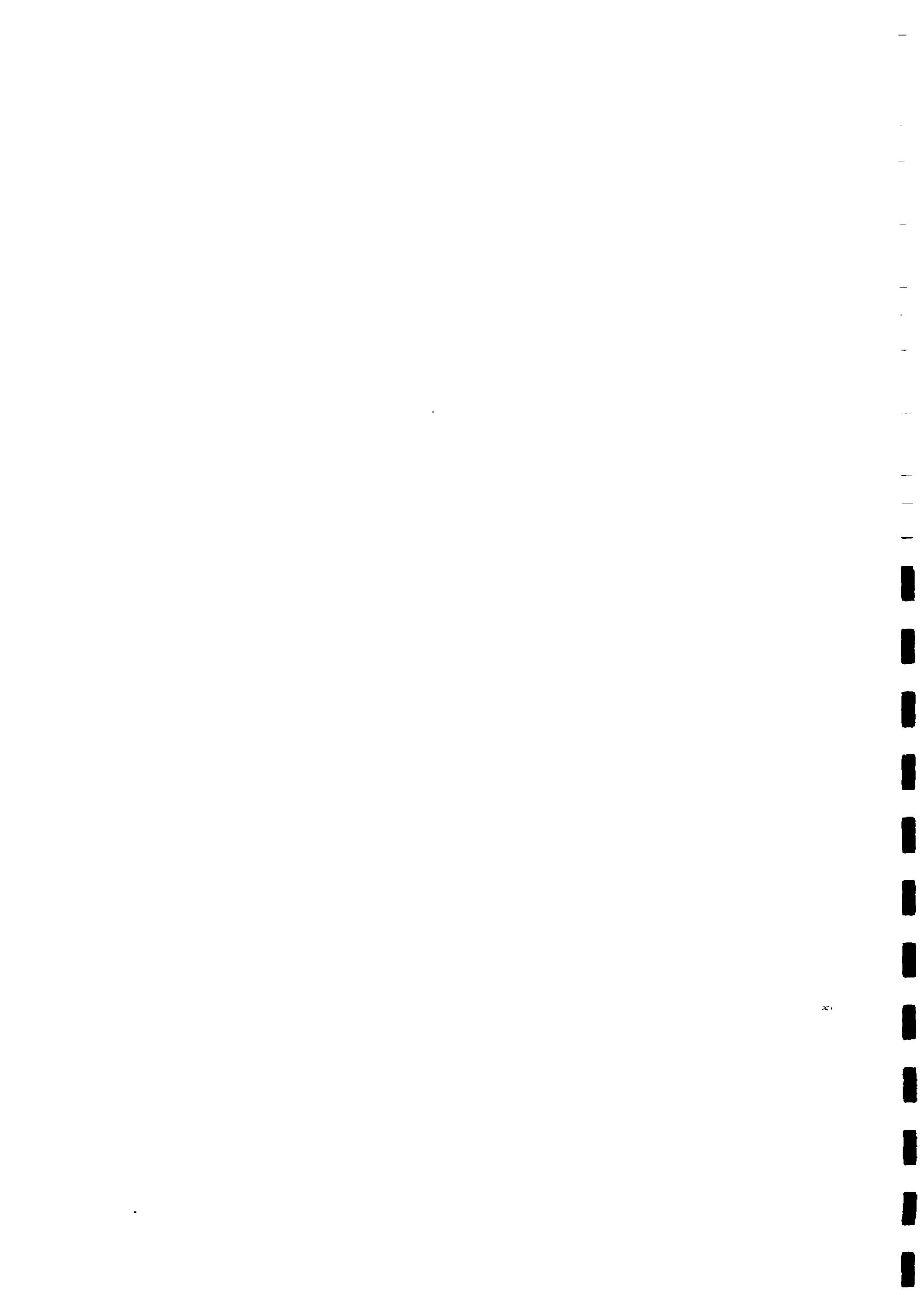
8.6 Low level of Hygiene Education

The proposed project is to improve health conditions of the people, and then, the realization of the expected health benefits will depend heavily upon successful hygiene education and public awareness programme. As illustrated in the Figure I the issues relating to the low level of Hygiene Education are crucial in addressing the core problem of lower level of health standards. Therefore a concerted programme of action is required to be implemented in parallel with the other activities of the project.



Part II Project Design

Part II of this report is to set forth a programme design on a logical framework which will address the issues relating to water supply sanitation and health, discussed in the Part I. It starts with providing an insight into the complexity and causal relationship of the problem and discusses how ultimate objectives and the components of the project are logically connected in addressing the existing issues. It, then, presents an outline of the project design. Finally a framework for the implementation of the pilot projects is provided.



1. *Basis of the project design*

The design of the proposed project is based on the following.

- a. Findings of the previous World Bank Missions and connected studies
- b. Findings of World Bank mission under reference.
- c. The outcome of the social assessment carried out by a World Bank Team assisted by a number of local and public research institutions of government of Kazakhstan.
- e. Agreement reached with the authorities at National, Oblast and Raion levels of the government of Kazakstan.

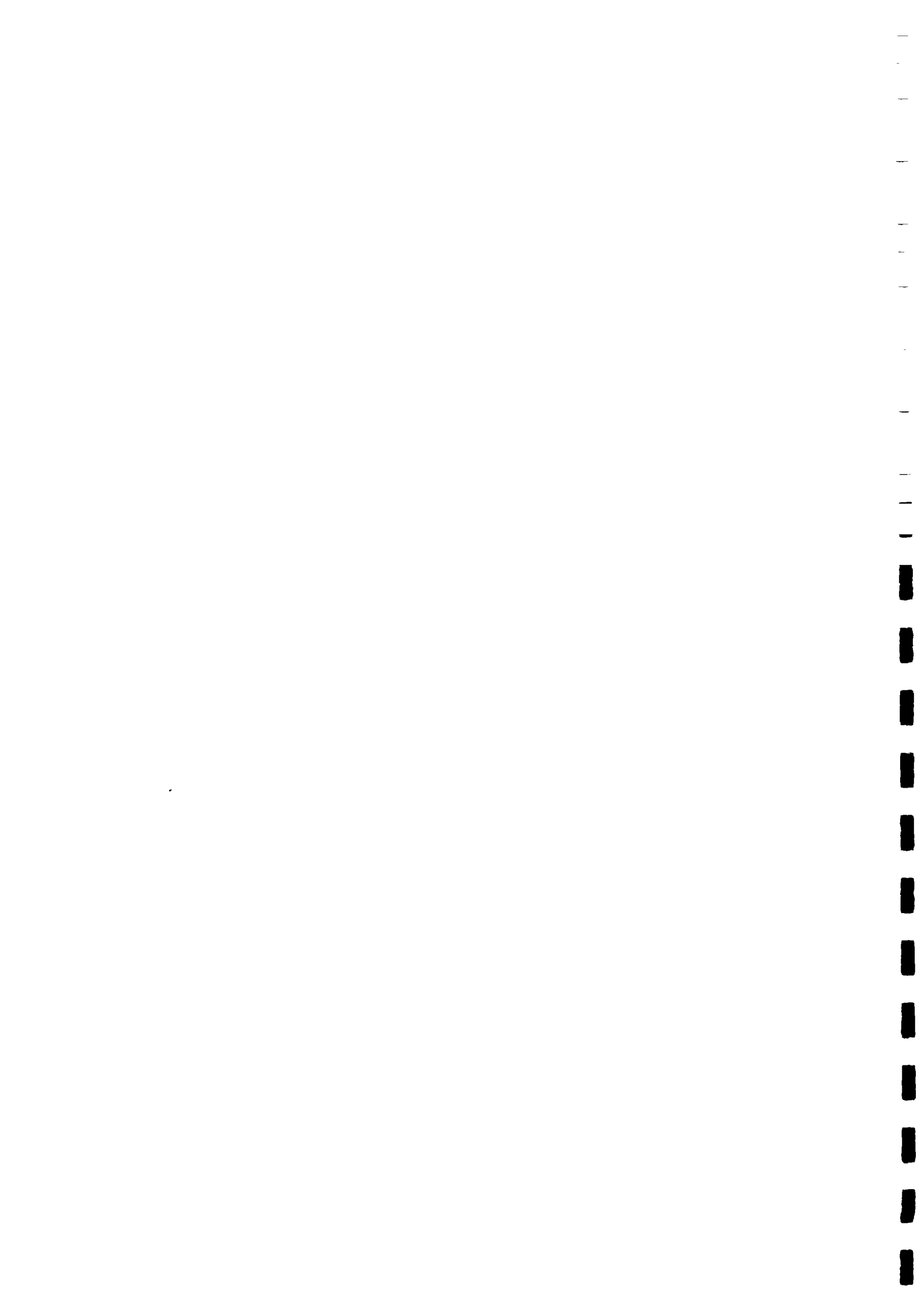
Problems associated with the water supply, sanitation and health sector in the project area are summarized in **Figure III** in a schematic framework. This diagram attempts to provide a cause and effect analysis of the existing problems and finally concludes that despite all these problems within the water supply, sanitation and health sector, as well as in a vast range of other areas, the trend of decreasing population in the project area has ceased and population is now stable due to various reasons. Therefore prevailing situation warrants investments for the improvement of basic requirements of the people justifying the implementation of the proposed project.

The project has been designed within the broad framework agreed at the meeting of the Heads of States of the Central Asian Region and thus focuses on providing a short term solution to the water supply, sanitation and health problems in a selected project area in the Aral Sea disaster zone.

On the basis of the above, an attempt has been made to develop the project design on logical framework. The objective of the project and the main components of the project were agreed upon to address the main problems identified in the light of main findings.

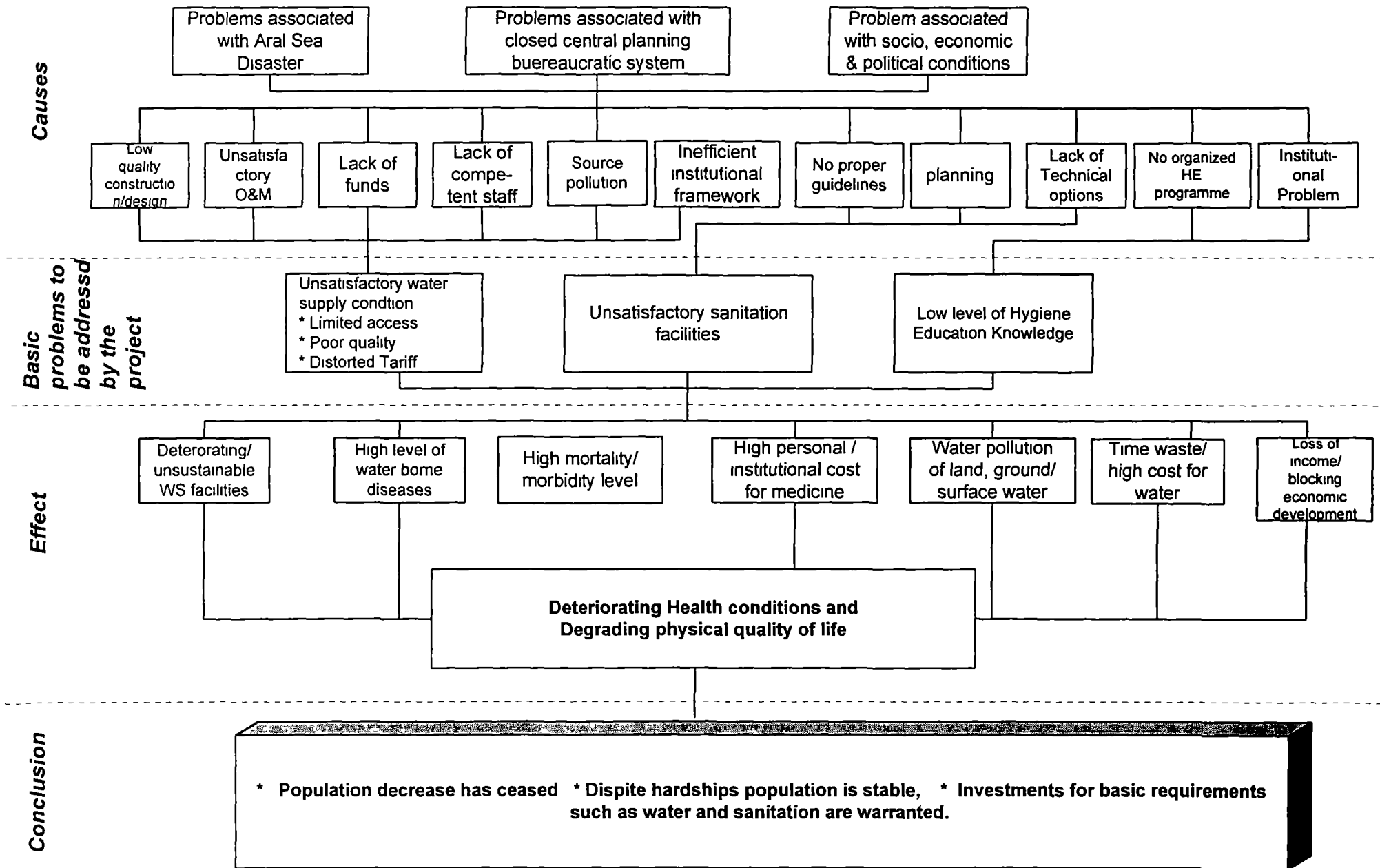
The relationship between the main findings and the main components of the project, and also with the ultimate objective of the project are illustrated in **Figure IV**. Basic forward linkages of the project eg., linkages of project objectives to the main components and components to address basic issues and causal problems etc., are indicated in dotted lines in the diagram. Detailed activities under each component will be decided and agreed upon during the project preparation period considering the lessons learned from the pilot projects and also on the basis of the feasibility studies scheduled to be carried out during the project formulation period.

Table II lists out summary findings and recommendations on each finding together with the connected project components under which relevant recommendations are transformed into workable activities to be carried out under each component aiming at addressing the basic issues and problems so identified.



*Problems associated d with Water Supply, Sanitation, and Health in the project area
 - A cause and effect analysis - in schematic framework*

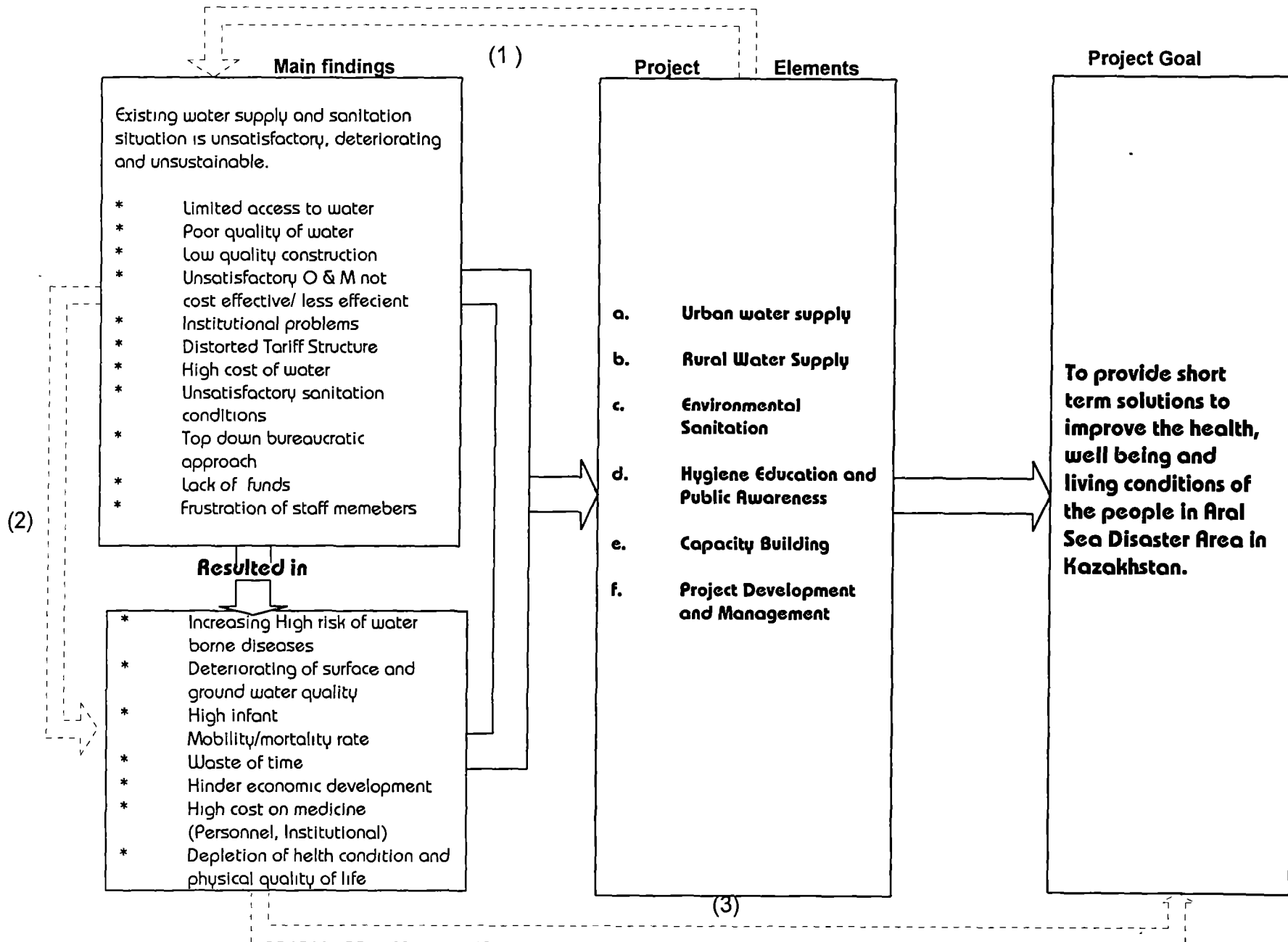
Figure III





*Relationship between main findings of problem analysis
- and Project Elements and Goal -*

Figure IV



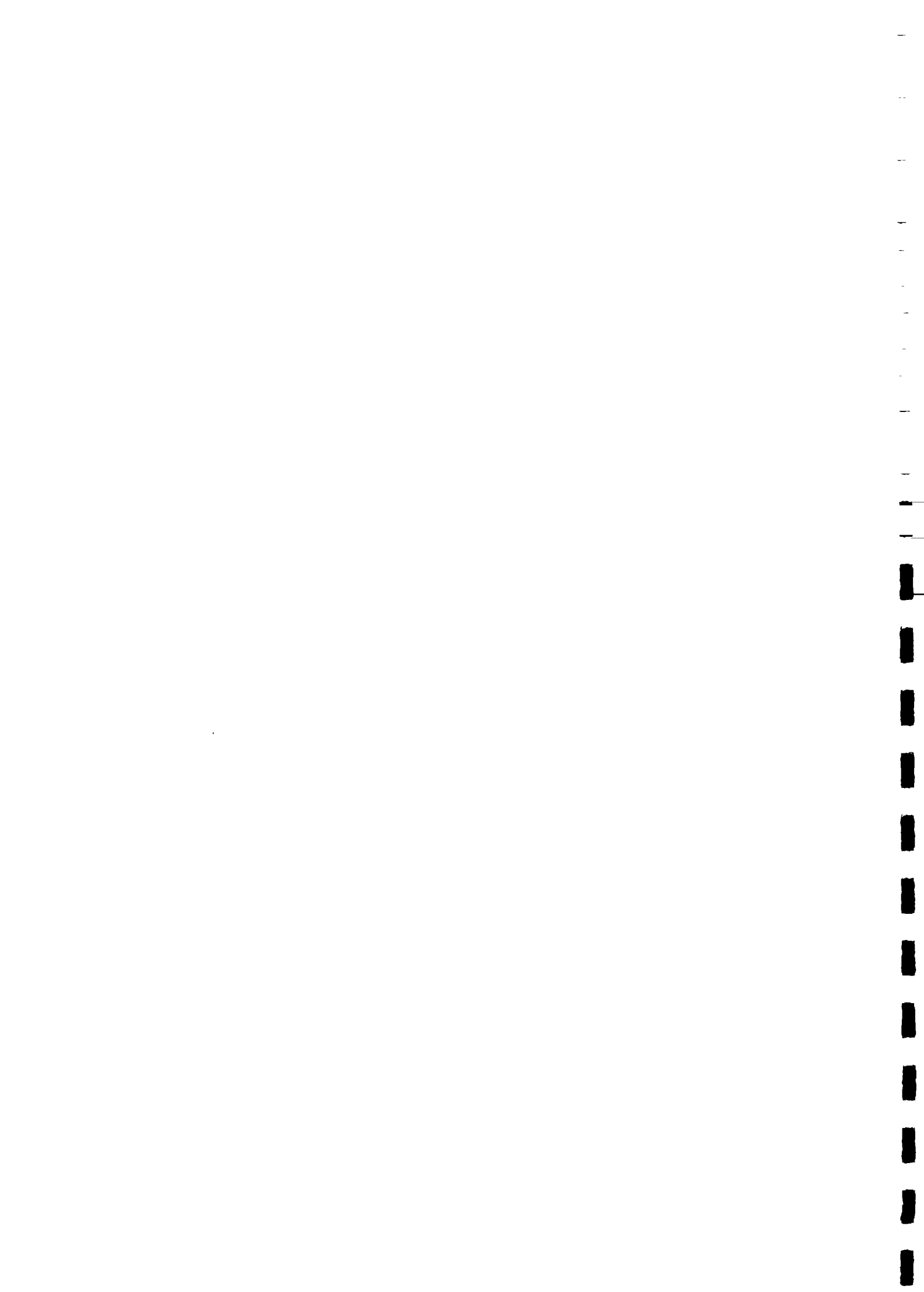
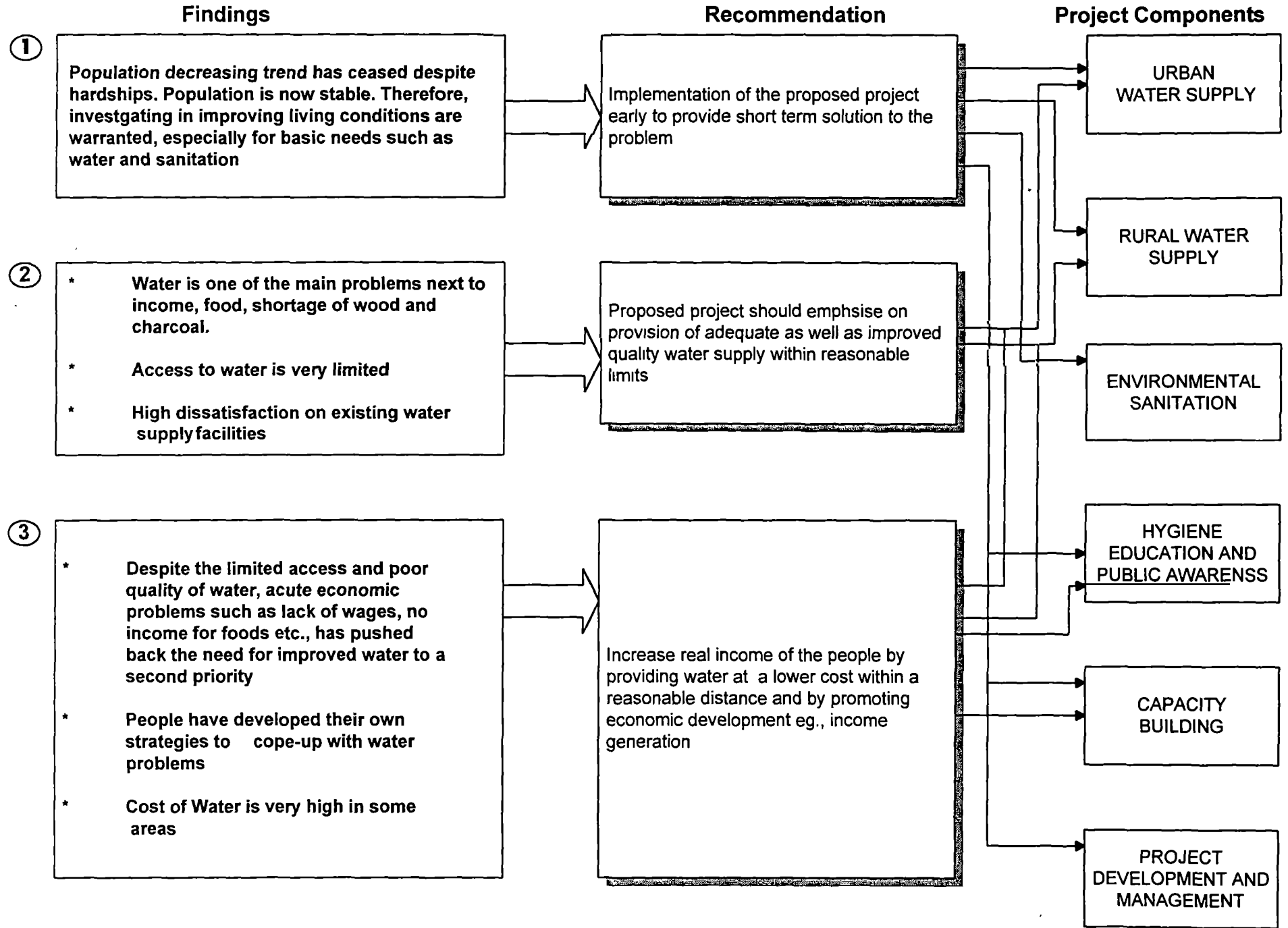
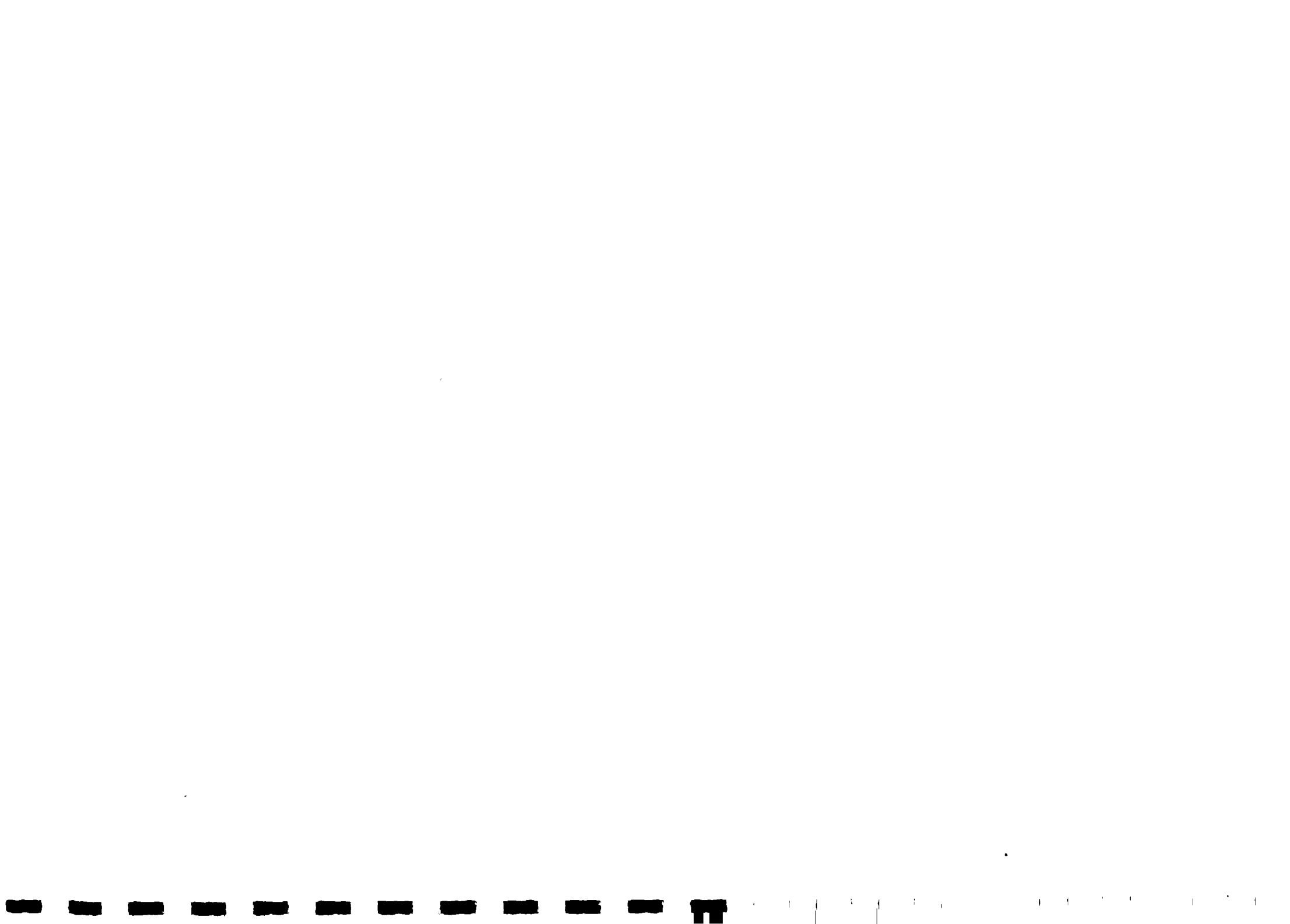
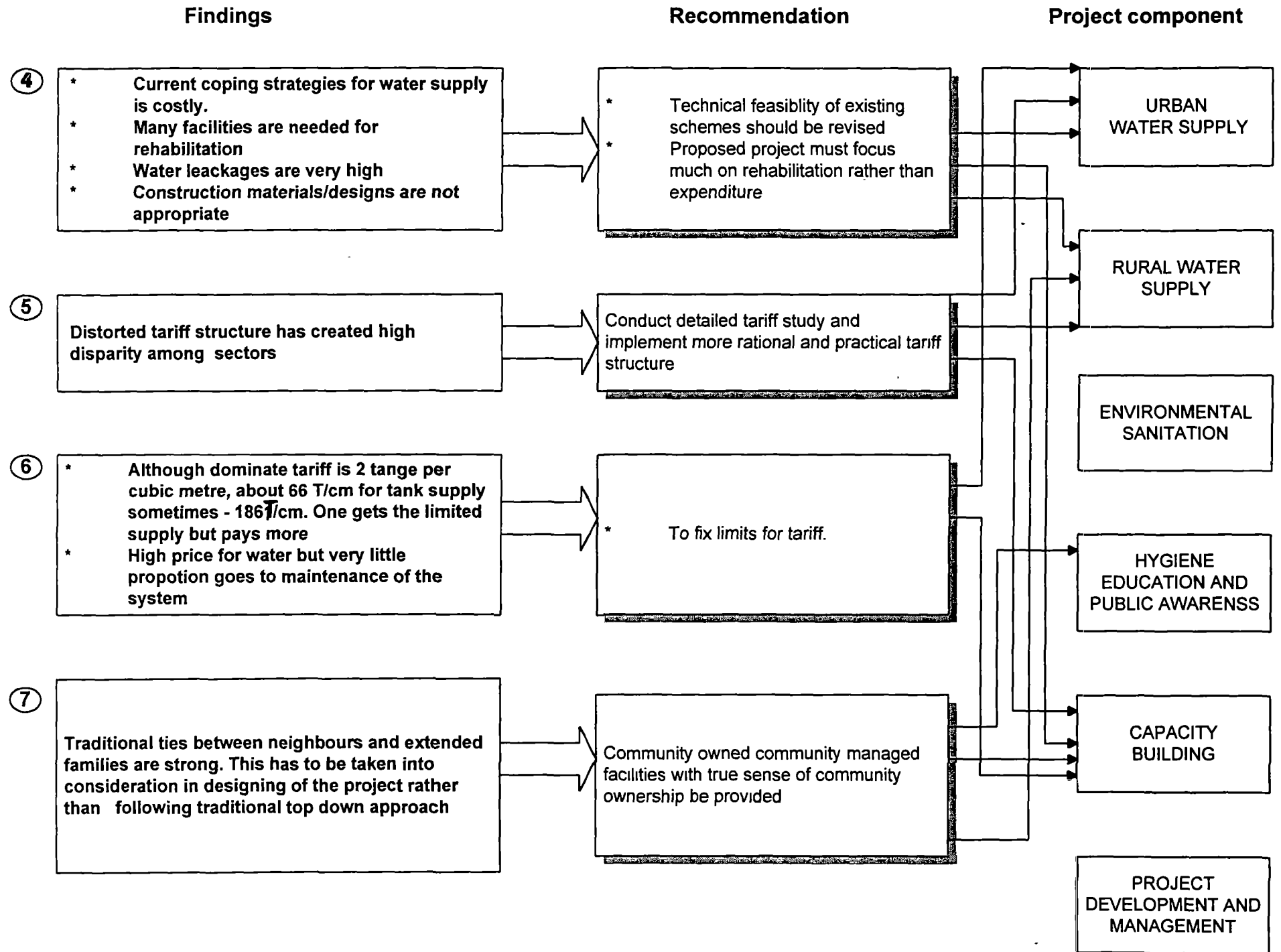


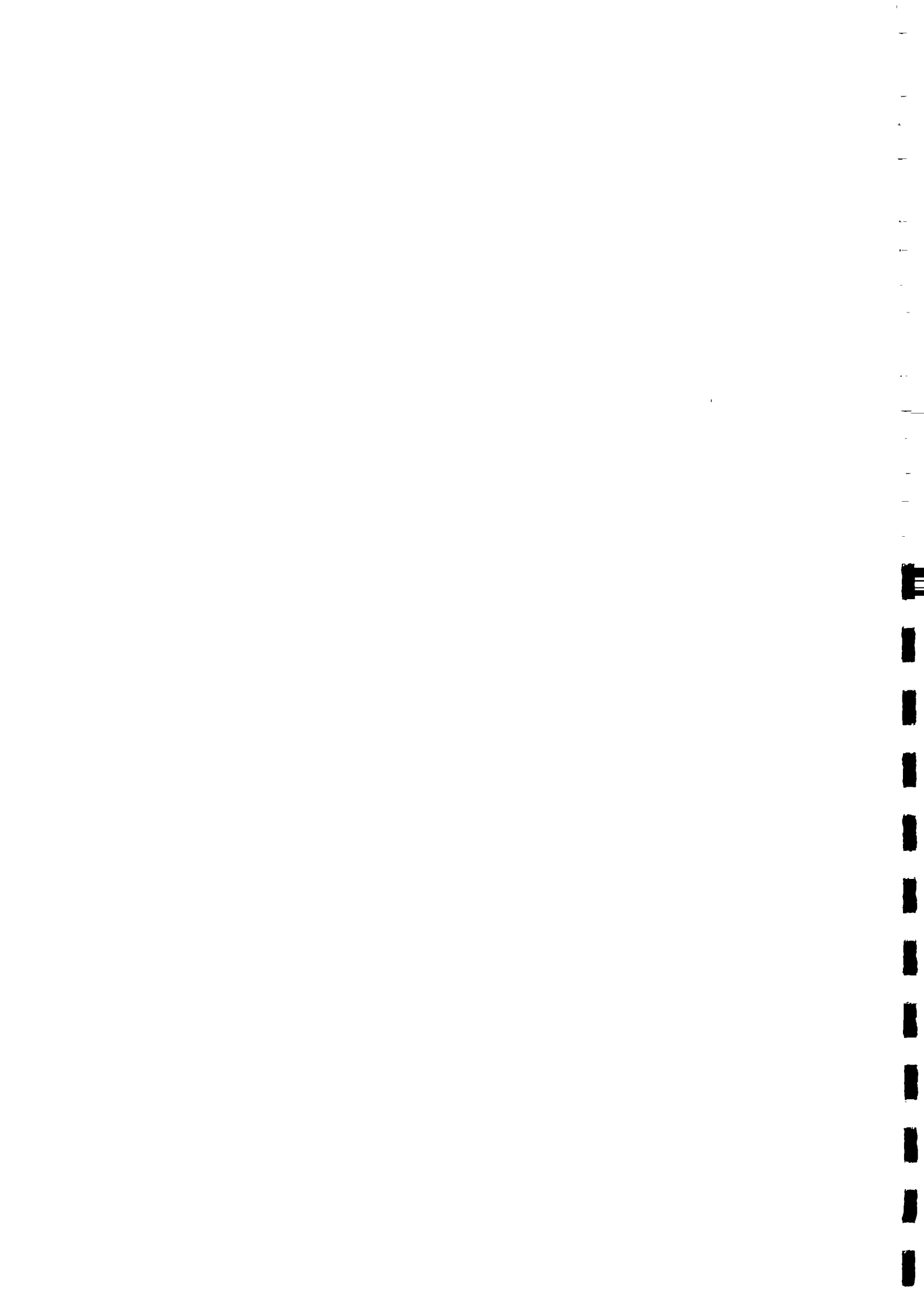
Table II

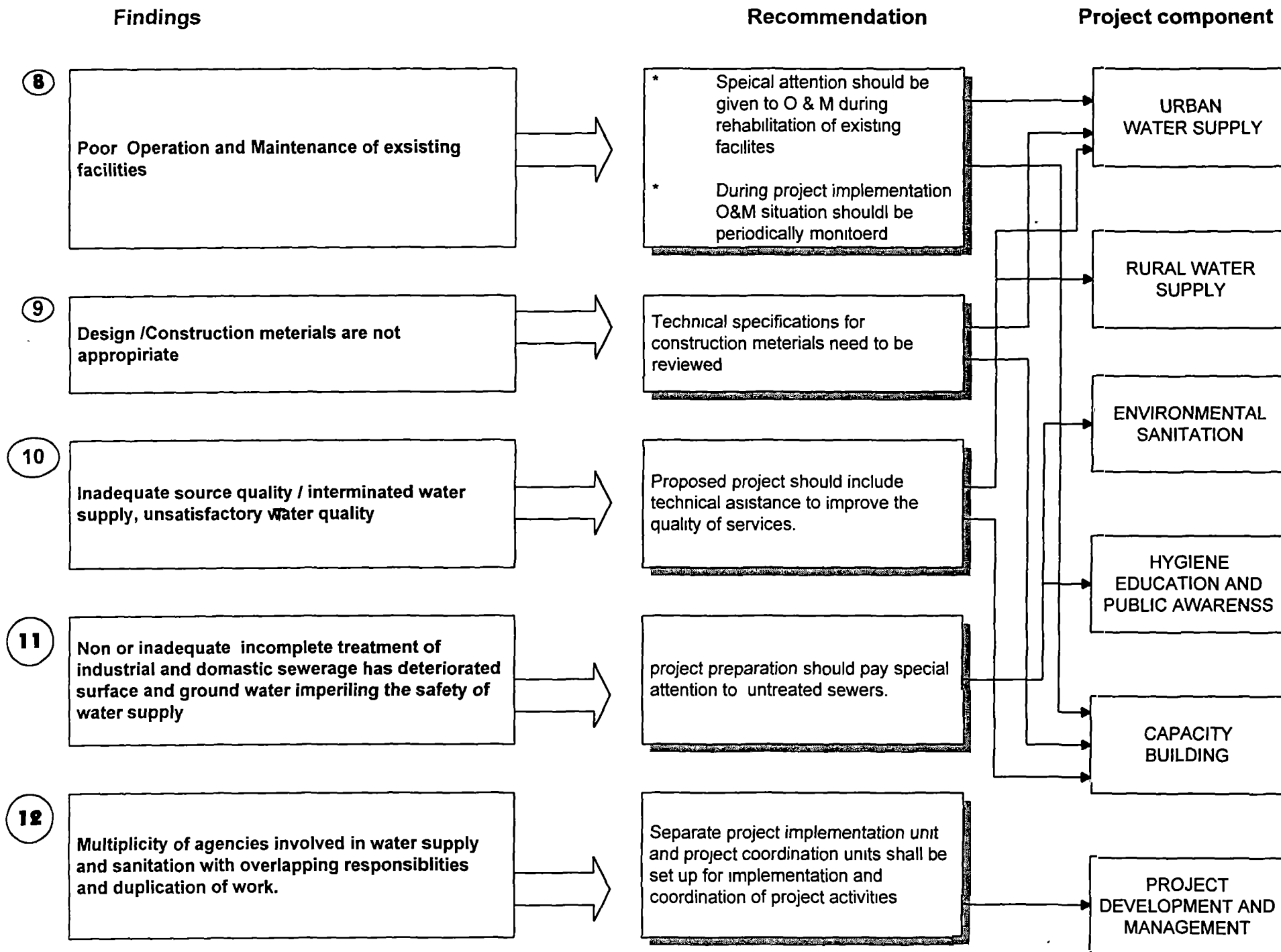
Relationship between main findings, recommendations & project components









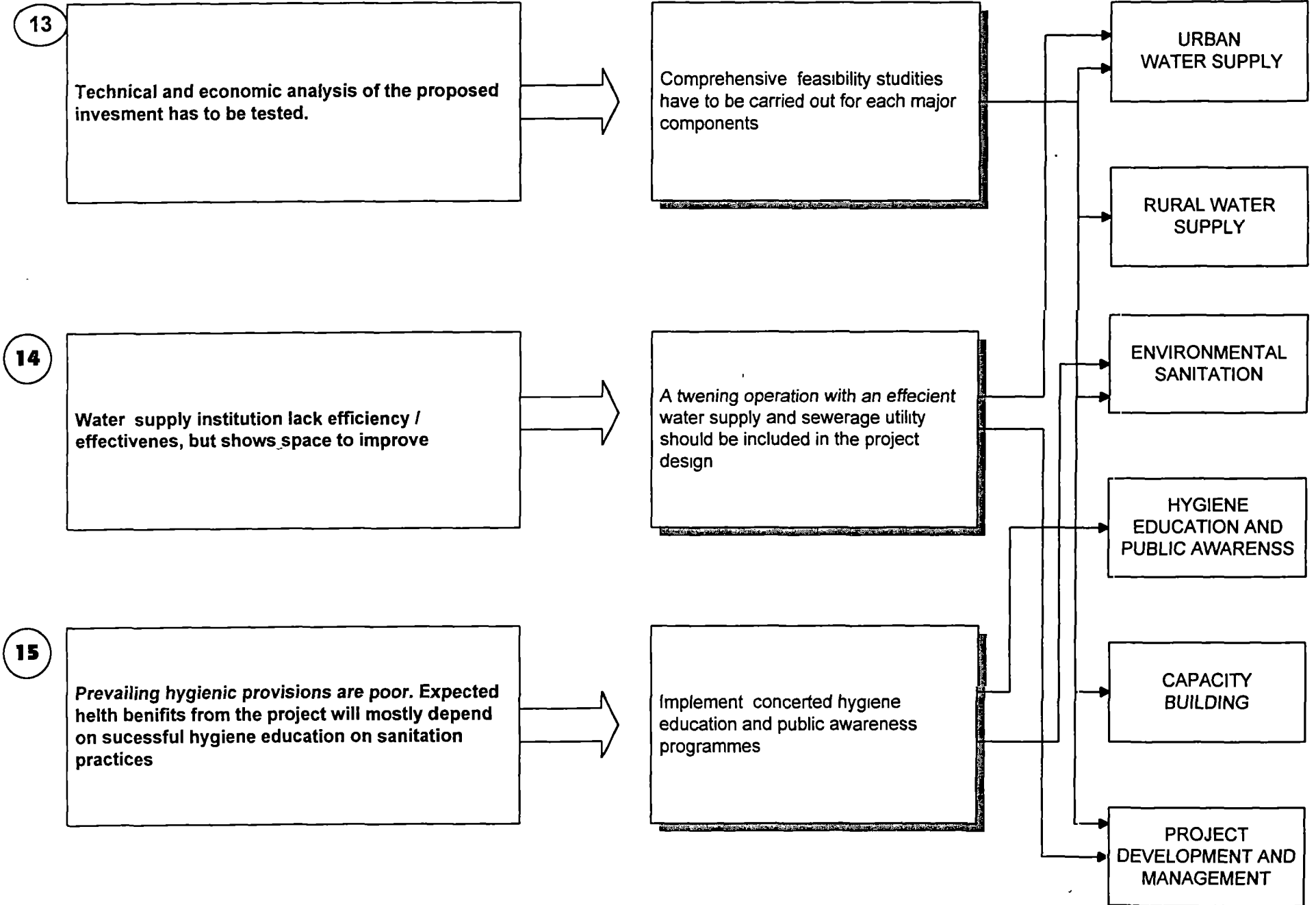




Findings

Recommendation

Project component





2. *Outline Project Description*

2.1 **Project Origin**

One of the planet's most serious environmental and human tragedies continues to unfold in the basin of the Aral Sea. Over the past 34 years, the sea has steadily shrunk as a result of a huge reduction in inflow from its two tributaries, the Amu Dar'ya and Syr Dar'ya, caused primarily by rapidly increasing use of water for irrigation of cotton, rice and other food grains, and fodder. In the aggregate, the area of the Ara Sea decreased by 52% from 69,000 to 33,000 km² and its volume fell by 74% from 1083 to 277 km³ between 1960 and 1993. The environmental and economic consequences of the Aral's desiccation have been wide-ranging and severe.

One of the areas hardest hit by the conditions that led to the Aral Sea crisis is along the Syr Dar'ya river in Kazakhstan's Kyzl Orda province (area of 228,000 km², and population of 651,000). Especially hard hit are two districts; Aralski and Kazalinski (about 150,000 people, two-thirds of whom are in the cities of Aralsk, Novokasalinsk, and Kazalinsk. Rural populations are also concentrated in large settlements: over 60% lives in state farms of more than 1,000 persons.

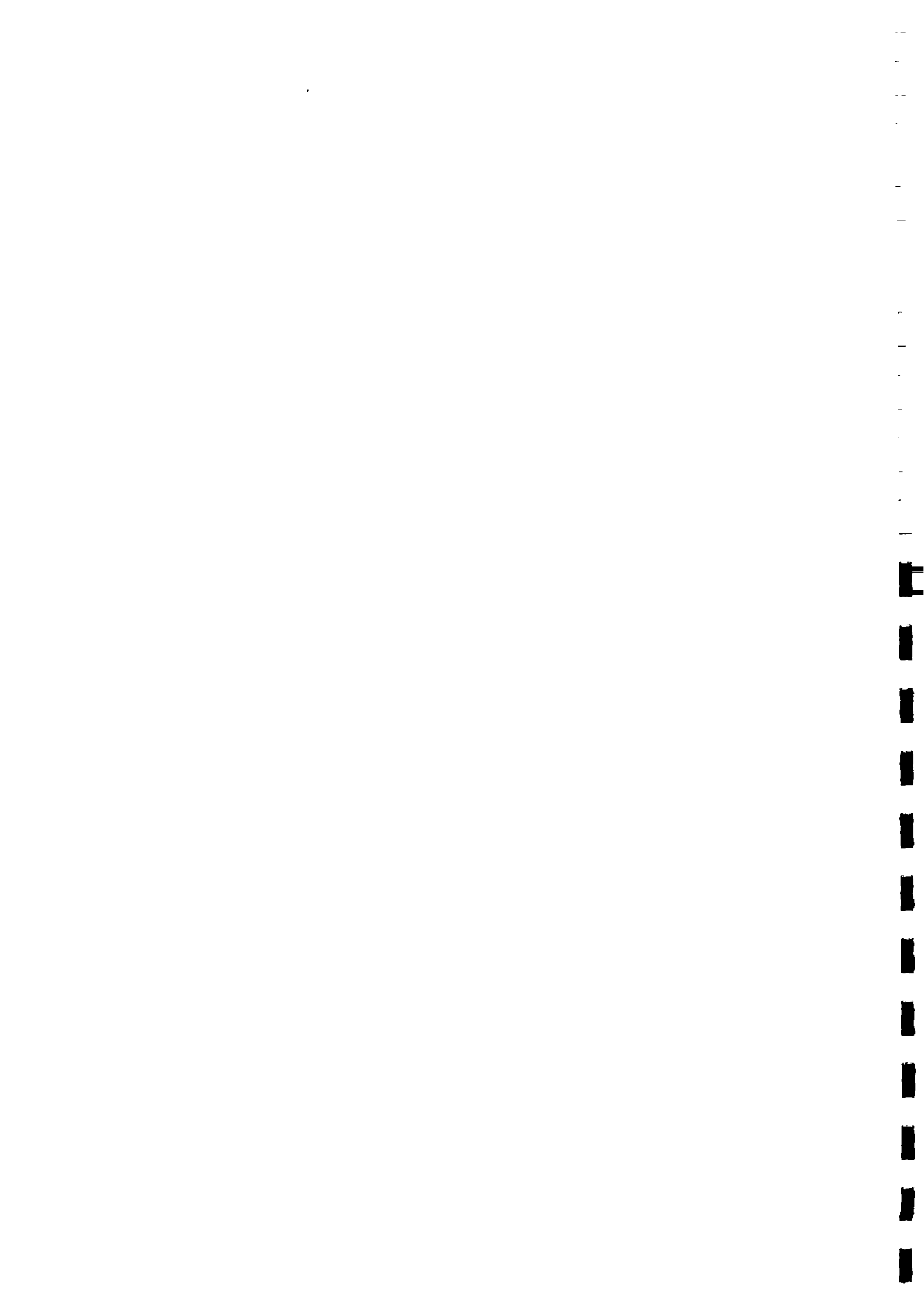
Unsatisfactory living conditions of about 150,000 people living in this Region is characterized by lack of potable water, poor sanitation and high risk of water borne diseases such as typhoid, paratyphoid, viral hepatitis and dysentery. The surface water quality has been increasingly deteriorating due to agro-chemicals, industrial and domestic effluent, and contamination with fecal pollutants.

The Heads of the State in Central Asian Region has therefore decided to launch a comprehensive programme of actions to combat the crisis in the short term, until more longer term and sustained solutions are sought out to deal with the root causes of the problems in a much more broader perspective.

Implementation of a water and sanitation health projects covering affected areas in Government of Kazakstan is one of the main projects included in this overall programme.

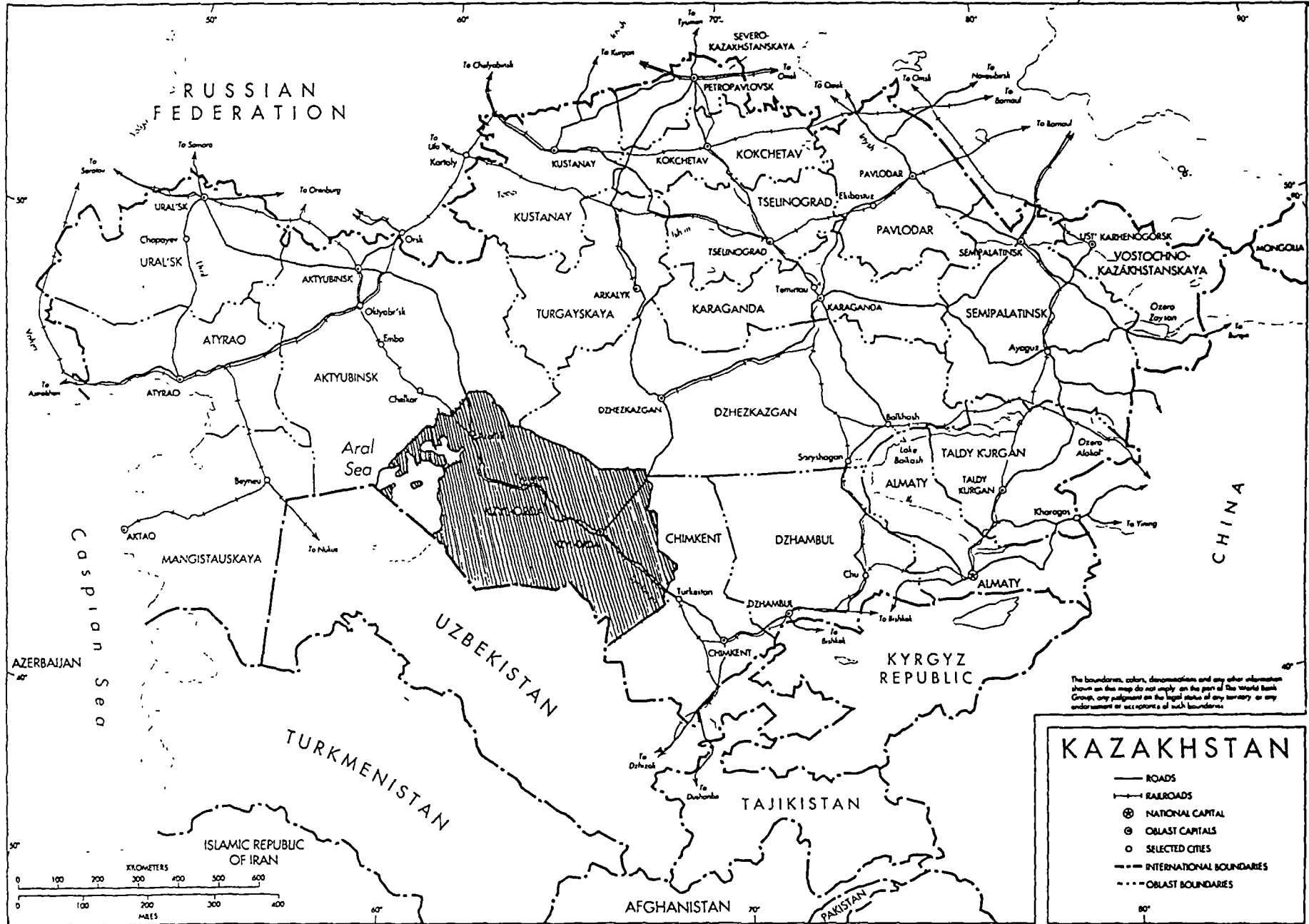
2.2 **Project Area**

The project area lies along the Syr Dar'ya River in Kyzl Orda Oblast of the Kazakhstan with special concentration on the hard hit Raions ie., Aralsk and Kazalinsk including three main cities of the region namely, Aralsk, Kazalinski and Nova Kazalinski in Arals Sea Disaster zone. (Please see map I).



Map of Kazakhstan

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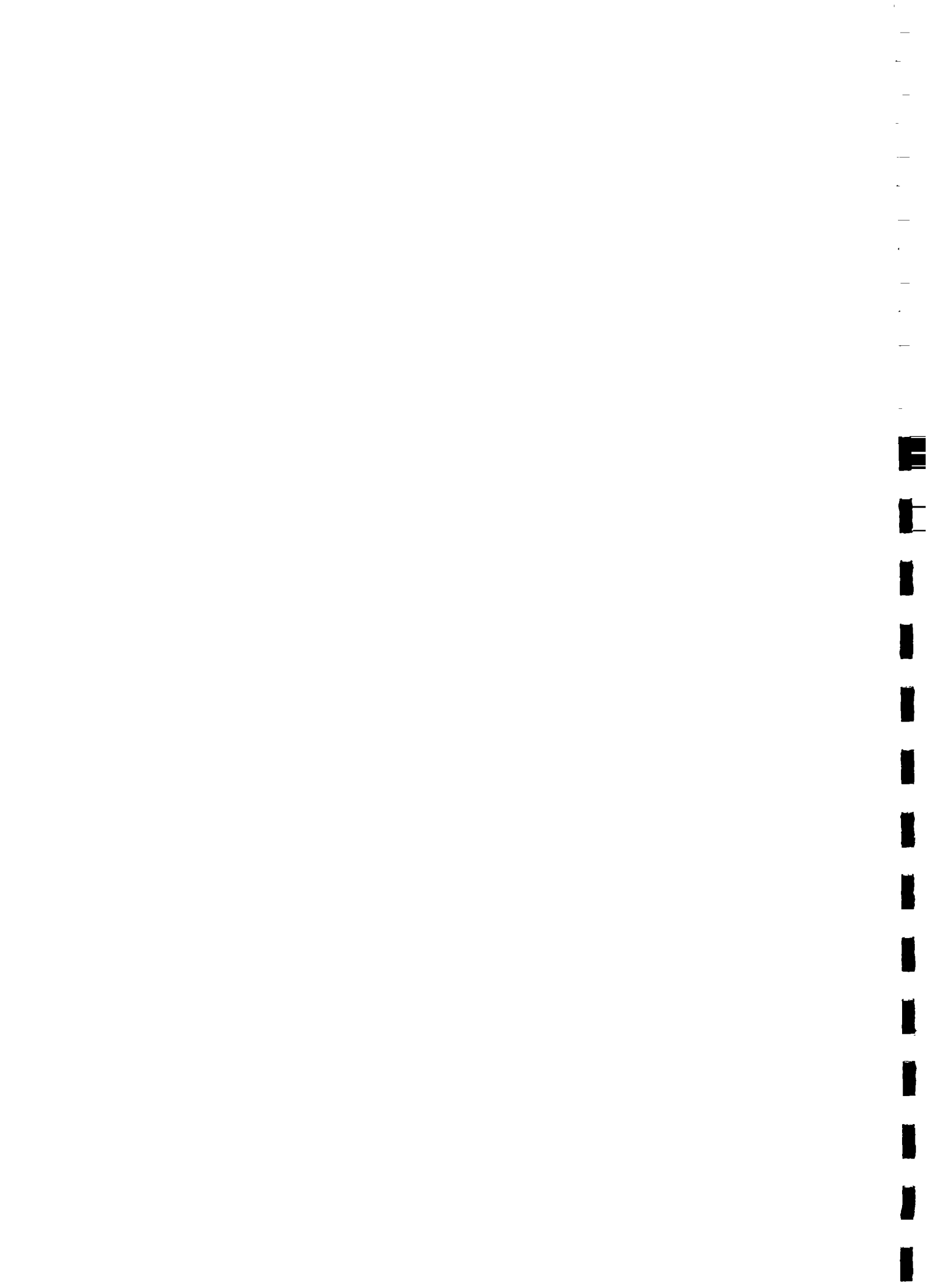
The boundaries, colors, denominations and any other information shown on this map do not imply on the part of the World Bank Group, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

KAZAKHSTAN

- ROADS
- +— RAILROADS
- ⊙ NATIONAL CAPITAL
- ⊙ OBLAST CAPITALS
- SELECTED CITIES
- - - INTERNATIONAL BOUNDARIES
- · · OBLAST BOUNDARIES

Project Area

MARCH 1994



The estimated population of the project area is about 150,000 and approximately 35% of which lives in urban areas-mainly in three cities. Others live in state farms and rural settlements. The population density is very low and Kazakhs is the dominant ethnic group (80%). Though the total population has decreased due to high rate of outmigration during the last decade this trend has reduced and population is now stable. The economy of the project area is based predominantly on agriculture facilitated by extensive irrigation network. However, the overall mismanagement of the water resources has created a series of acute environmental problems such as depletion of soil quality, surface and underground water, and land resources, and also drying up of Aral Sea, disappearance of bio-diversity etc., resulted in devastating effect on day to day life of the people. In Kazakstan, the economic and environmental consequences of this mismanagement translate into severe reduction in the overall agricultural and livestock production, unsustainable patterns of agricultural and industrial production in the upstream areas of Syr Dar'ya, loss of forest cover, the loss of pastures, wet lands and cultural heritage.

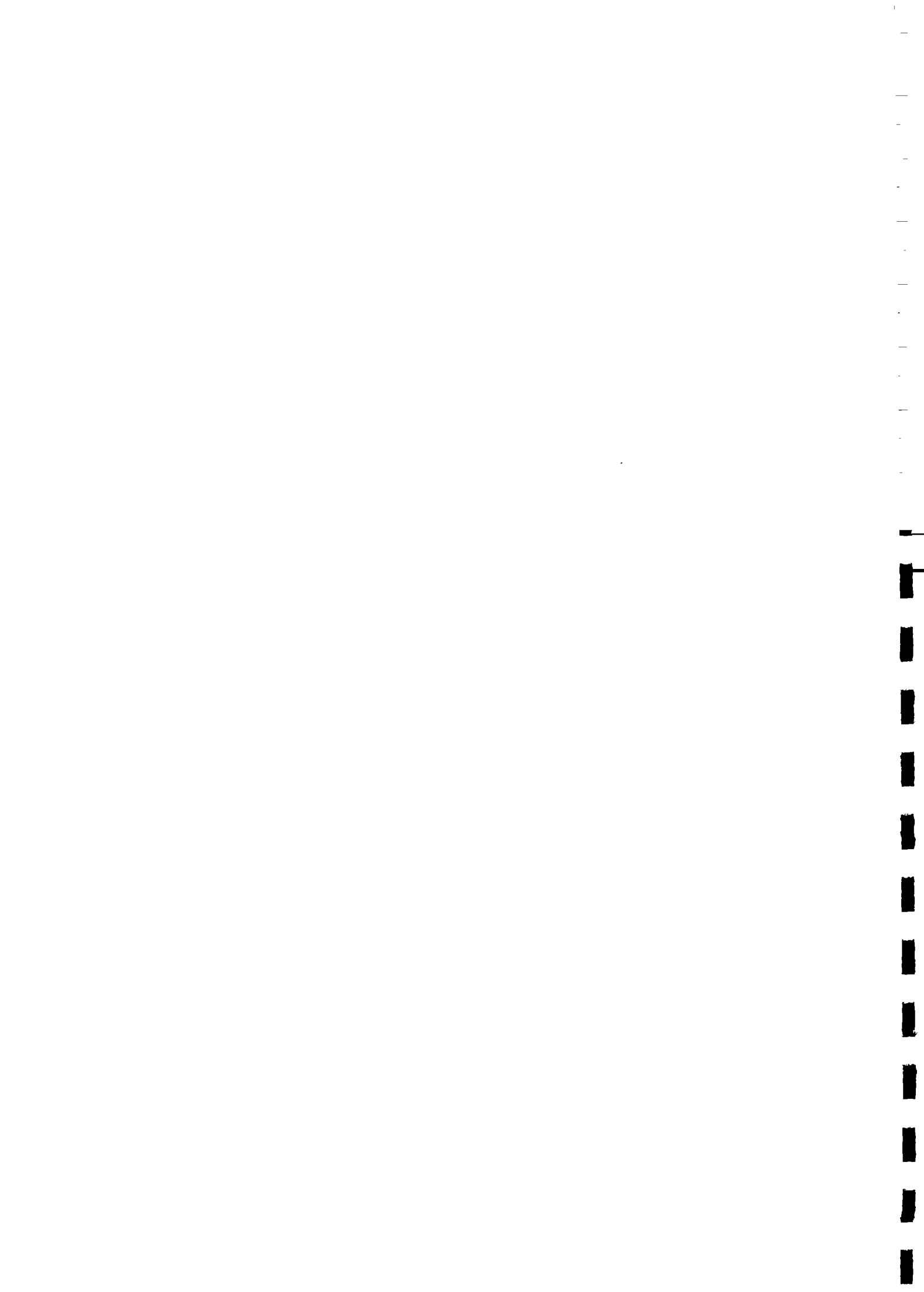
The Project area has most directly affected by the crisis, the soil quality has deteriorated when salt storms resulting from the desertification of the bottom of the Aral Sea and the salinization resulting from intensive irrigation increased. Major economic losses occurred because decertification has spread, water logging took place in areas adjacent to emerging salt swamps and salt lakes, groundwater levels and salinization rose, and homes and other structures ruined by rising ground water. In addition, orchards, vineyards, gardens and pastures disappeared, fishing and shipping industries were completely lost, and pulp factories became unoperational when reed swamps were destroyed.

2.3 Project Goal and Objectives

The project goal is to provide short term solutions to improve the health, well being and living conditions of the people in the Aral See disaster zone in Kazakhstan through the provision of safe, adequate and affordable water supply and improved sanitation facilities together with hygiene education services ensuring sustainability.

Objectives of the project are to;

- a. Provide better water supply services by rehabilitating existing water supply schemes
- b. Provide technical assistance to enhance the institutional capacity of agencies involved in water supply to cities of Aralsk, Novokazalinsk



and Kazalinsk to improve their efficiency, cost effectiveness, financial viability and to develop them into autonomous and self-reliant entities.

- c. Implement community projects for rural settlements adopting a community based approach to provide affordable water supply sanitation facilities, enhance public awareness/hygiene education level - provide training for income generation activities, build up / strengthen institutional base at the community level to ensure long term sustainability
- d. Develop private sector organizations for the designing, execution and O & M of water supply facilities and to assist communities for income generation activities.

2.4 Programme components

The components of the project have been identified on a functional basis; that is, they especially describe key areas where results are expected to meet the ultimate objectives of the project.

Various components of the project are summarized below.

a. Water Supply

This component aiming at providing better water supply facilities to about 150,000 people living in project area, would consist of two major sub components.

i. *Urban water supply*

Under this sub component, activities such as leak detection and control programme in the two major cities in the project area, Repair of main pipe lines of the Aral Sarybutak system (if it is the least cost alternative), rehabilitation of existing wells, rehabilitation of existing water supply network will be implemented. The least cost technical solutions would be taken as the base case to ensure as much coverage as possible with the resources available.



ii. *Rural water supply*

This sub component would include design and construction of rural water supply schemes with an objective of providing improved water supply and sanitation facilities owned and managed by the communities for presently unserved or underserved rural settlements adopting a community based approach. This would also support software activities for community mobilization and organizational development including a package of activities for capacity building and mobilization of organizations and formation of community based organizations to plan, implement and manage their own water supply development programmes. A training programme for income generation activities will also be undertaken.

b. Environmental sanitation.

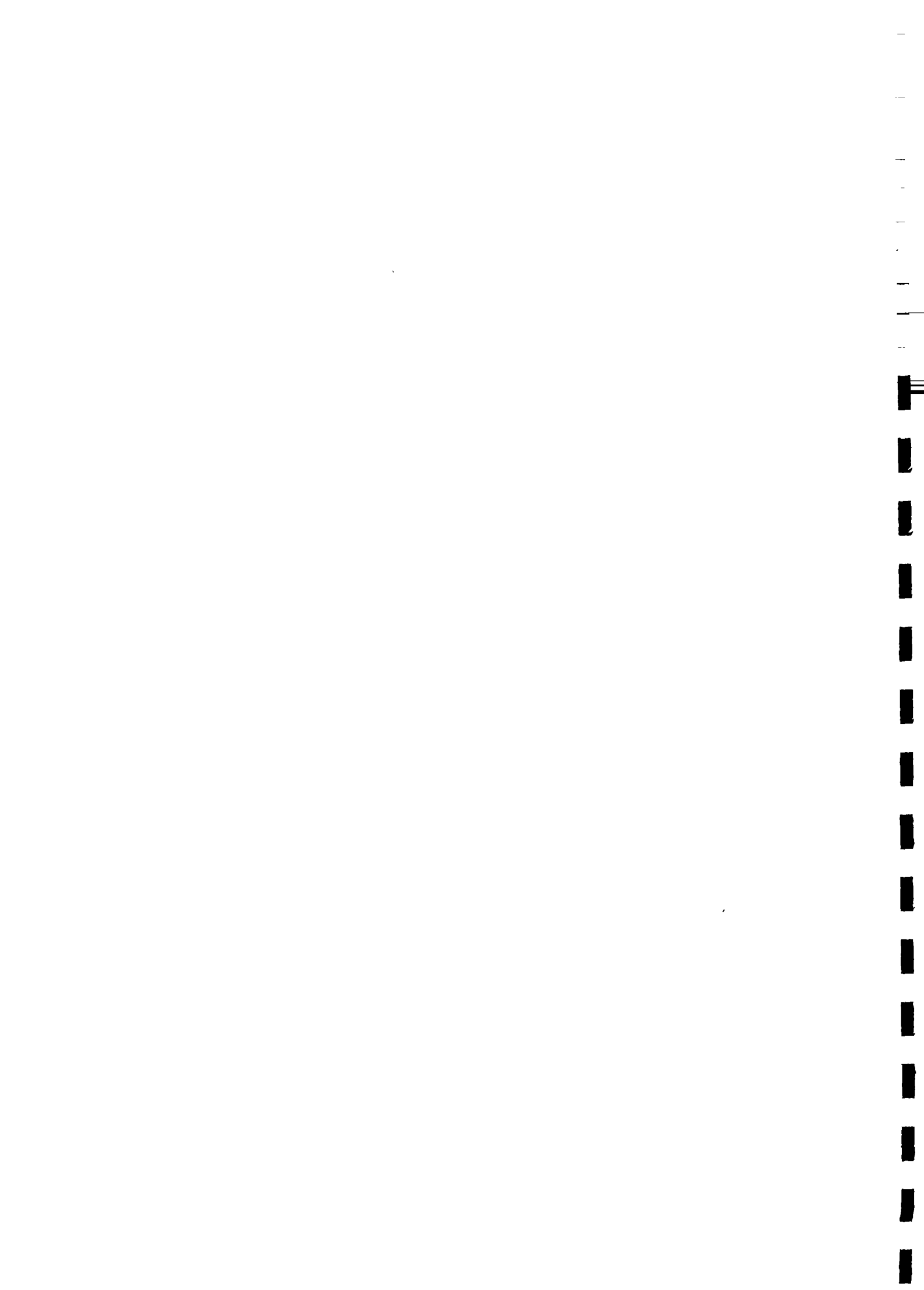
This component includes providing assistance to urban settlers to build community septic tanks and small bore sewerage systems where the existing latrines are polluting ground water; and assisting rural communities to construct individual toilets and showers.

c. Hygiene Education and Public Awareness

Realization of expected health benefits from the project will depend heavily upon a successful hygiene education and public awareness programme. This component thus aims at enhancing the public participation and awareness to manage water and sanitation services; and increase population information on the role played in improving their health conditions through effective hygiene practices.

d. Capacity building

This component would assist agencies responsible for water supply at Oblast, city, and settlement levels. Technical assistance and training would be provided for these agencies to enhance their efficiency, cost effectiveness, financial viability and also to make them self-sufficient.



e. Project development and management

This component would include the establishment, equipping and operation of project coordinating cell and Project Implementation Unit with additional staff and consultants. All PIU costs have to be treated as project investment cost. The PIU would also finance promotional activities, publicizing the project site selection, registering community organizations, etc.,

2.5. Project implementation strategy

a. Overall Strategy and Approach

The proposed project is to provide short term solutions to a complex and inter-related set of problems in the area of water supply, sanitation and health and thus expect direct positive impact on human health, well being and living conditions. As such a considerable attention has been given to the formation of a project strategy and approach which will meet the objective in more efficient, effective and sustainable manner.

The overall strategy of the project is to adopt a holistic approach in achieving the goal of the project. On one hand it could integrate all facets of development in the field i.e. water supply, sanitation, hygiene education, environmental protection, community development, capacity building and institutional strengthening in order to address whole spectrum of the problem at once. On the other it could integrate technical solution with the institutional factors and the beneficiary need and affordability in order to provide affordable and sustainable water supply and sanitation facilities.

Involvement of all stakeholders- specially the beneficiaries would be the central theme of the strategy and hence participatory planning, partnership development and adaptive approach are of vital importance in the project strategy.

b. Urban Strategy

The proposed project has been designed to adopt dual approach in urban and rural areas. In urban areas the project will focus on rehabilitation of existing water supply schemes and capacity building of institutions involved with a view to providing better water supply services to the urban areas and surrounding agricultural settlements presently covered by the existing water supply schemes. The main challenge in this regard will be to rectify



technical deficiencies, rehabilitate existing schemes, upgrade service levels and to strengthen the institutional capacity in order to provide better water supply services enhancing sustainability. In this connection improving the efficiency and cost effectiveness of existing agencies is of paramount importance.

In view of the foregoing, the project would adopt a integrated approach in urban water supply, focusing on technical improvements and as well as institutional and socio economic and financial matters with a view to restructuring and upgrading existing agencies into autonomous and self reliant entities with sufficient capacity to provide water supply services to the region on a sustainable basis.

c. Rural Strategy

In providing improved water supply and sanitation facilities to rural areas the project would adopt an innovative community based approach giving communities more responsibility for the facilities and services provided thus enhancing sustainability. The proposed approach, strategy and process for the implementation of pilot project will be discussed in section 03 of this report .

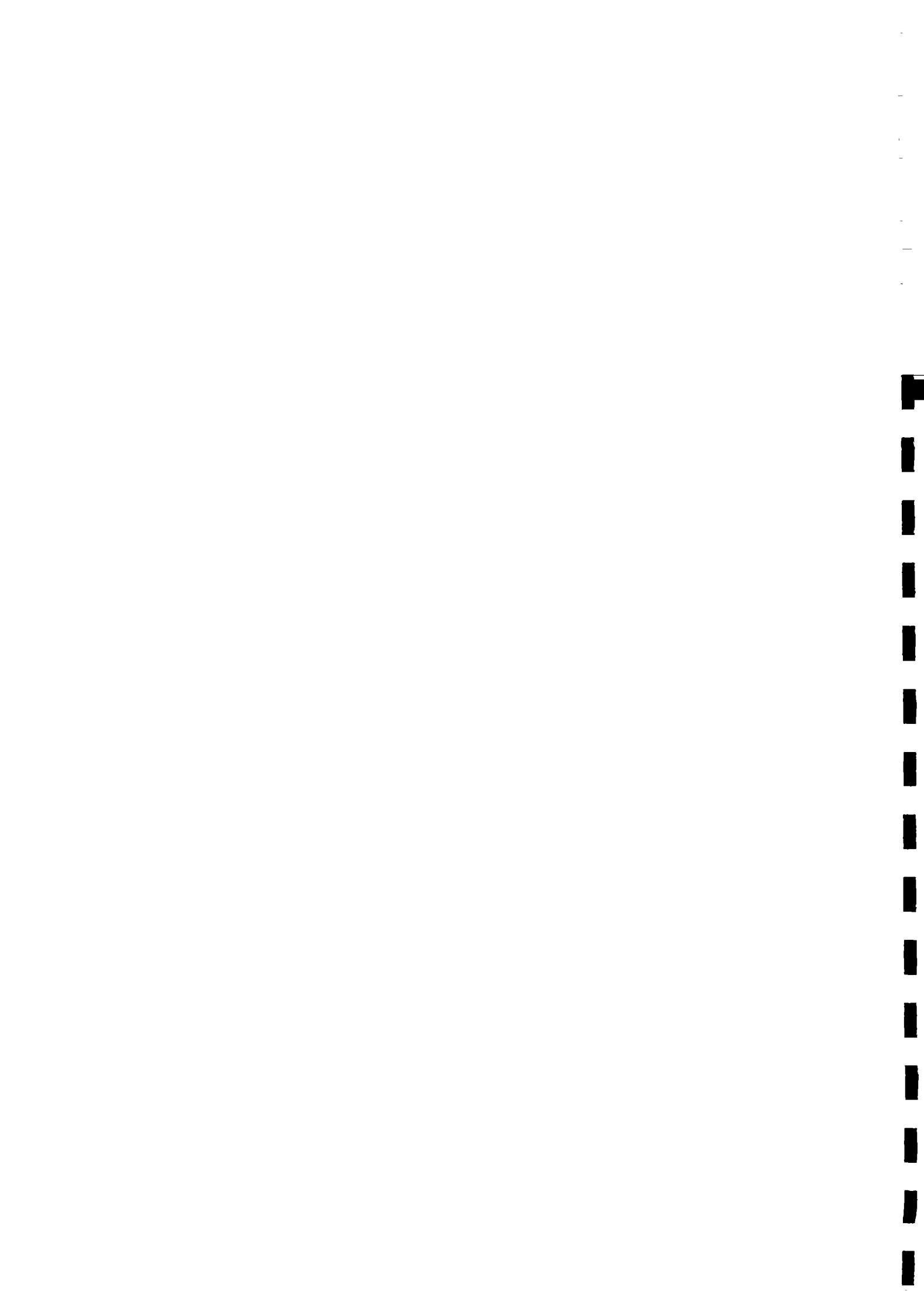
d. Piloting

One of the important features of the implementing strategy is to start small with the implementation of pilot projects during the project preparation phase so as to incorporate lessons learned in to the final project design. Therefore, project design demands flexible and programmatic approach.

e. Twinning Arrangement

Another innovative approach of the project approach will be the establishment of twinning arrangements with competent professional sector agencies with experience in the implementation of similar projects. Effective twinning through sharing of expertise and close cooperation will open up opportunities for the Project Implementation Unit to access relevant expertise and information quickly, ask advice and get training and exposure to new developments in water supply and sanitation.

This arrangement would be of particular relevance for the sector institutions in Kazakhstan as these have not had access to recent developments in the delivery and management of water and sanitation facilities. Through twinning, it is expected that both urban and rural water agencies in Kazakhstan will faster and more efficiently be able to address



the challenges of the day and establish their competence as sector (support) agencies.

Two such twinning arrangements have been agreed upon, one for urban water supply and another for rural water supply.

In the case of urban water supply, the twinning arrangement is in particular aimed at addressing three areas of concern:

- * operational measures to improve the functioning of existing schemes.
This will include leak detection and control, water conservation promotion, appropriate levels of stocking of spare parts, training of maintenance and repair crews.
- * financial measures aimed at making the water supply operation financially self reliant. This will need to include revenue collection systems, financial monitoring, financial forecasting, especially for O&M and scheme improvement, long term financial planning.
- * legal measures and corporate bylaws.
This will include legislation and bylaws related to source protection and the pollution of ground and surface waters; promotion of general water resources protection; sewerage, drainage and disposal; water supply and sewerage connections for different categories of users, as well as the monitoring and enforcement of the various legal provisions.

For rural water supply, the twinning arrangement will focus on the following areas:

- * development of policies and procedures for community based water supply and sanitation;
- * developing approaches for community mobilization and organization for sustainable water and sanitation;
- * training of various levels of staff in the techniques and approaches used in community based water supply and sanitation, as well as exchange visits and stages in projects executed by the twinning partner;
- * development of appropriate O&M systems;
- * development of relevant participatory monitoring systems;



2.6 Organizational arrangements

2.6.1. Overview

As describe in section 7 of the Part I of this report a large number of agencies at National Oblast and Raion levels have been working with water supply and sanitation without much coordination and with overlapping responsibilities. Therefore, one of the areas where a serious attention is needed in implementing the proposed project for the institutional arrangements in view of the fact that have seen pointed out in the Part I of this Report, and also for the main findings of the Mission. All administrative setup of the country that inherited from USSR, the strong central planning and command bureaucracy are now in the process of transformation . Most of the institutions have very little experience in project planning and implementation of time bound programmes within a flexible democratic framework. Overlapping responsibility and duplication have become common phenomena in everywhere. Demoralization and frustration mainly due to low wages, nonpayment of salaries and widespread corruption have aggravated this situation future.

In view of the foregoing much consideration needs to be given to the appropriate institutional structure in order to ensure smooth and timely implementation of the project activities. Having in mind that the scope of the project involves various agencies at national, Oblast and Raion levels much attention have been focused on the suitable organizational structure for;

- a. Project preparation
- b. Project implementation and,
- c. Project coordination

Effective coordination mechanisms to coordinate various project activities as well as to establish proper liaison vertically and horizontally is an essential pre-requisite for the proper formulated and implementation of the project.

Overall Organizational Structure of the project is illustrated in Figure V.

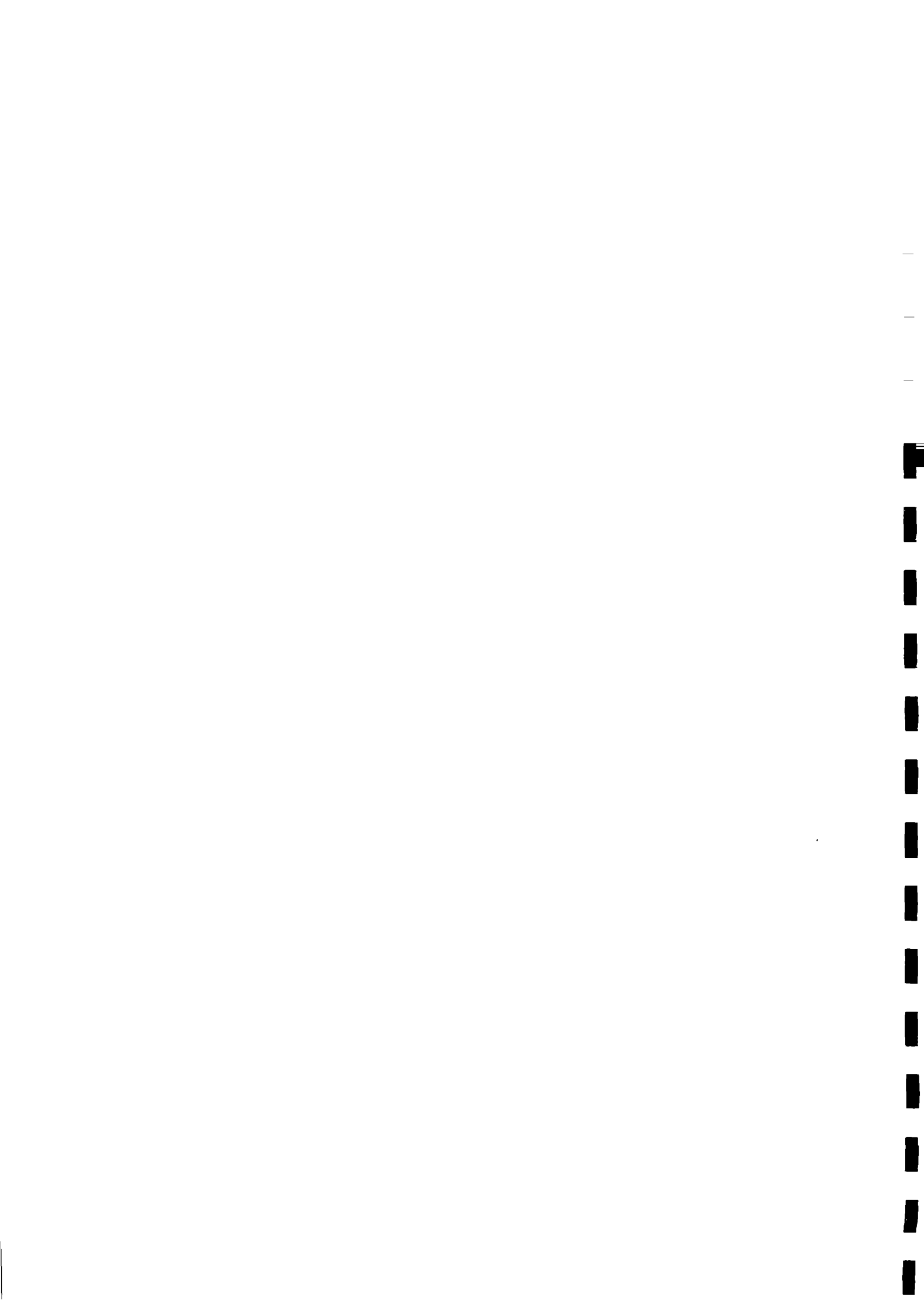
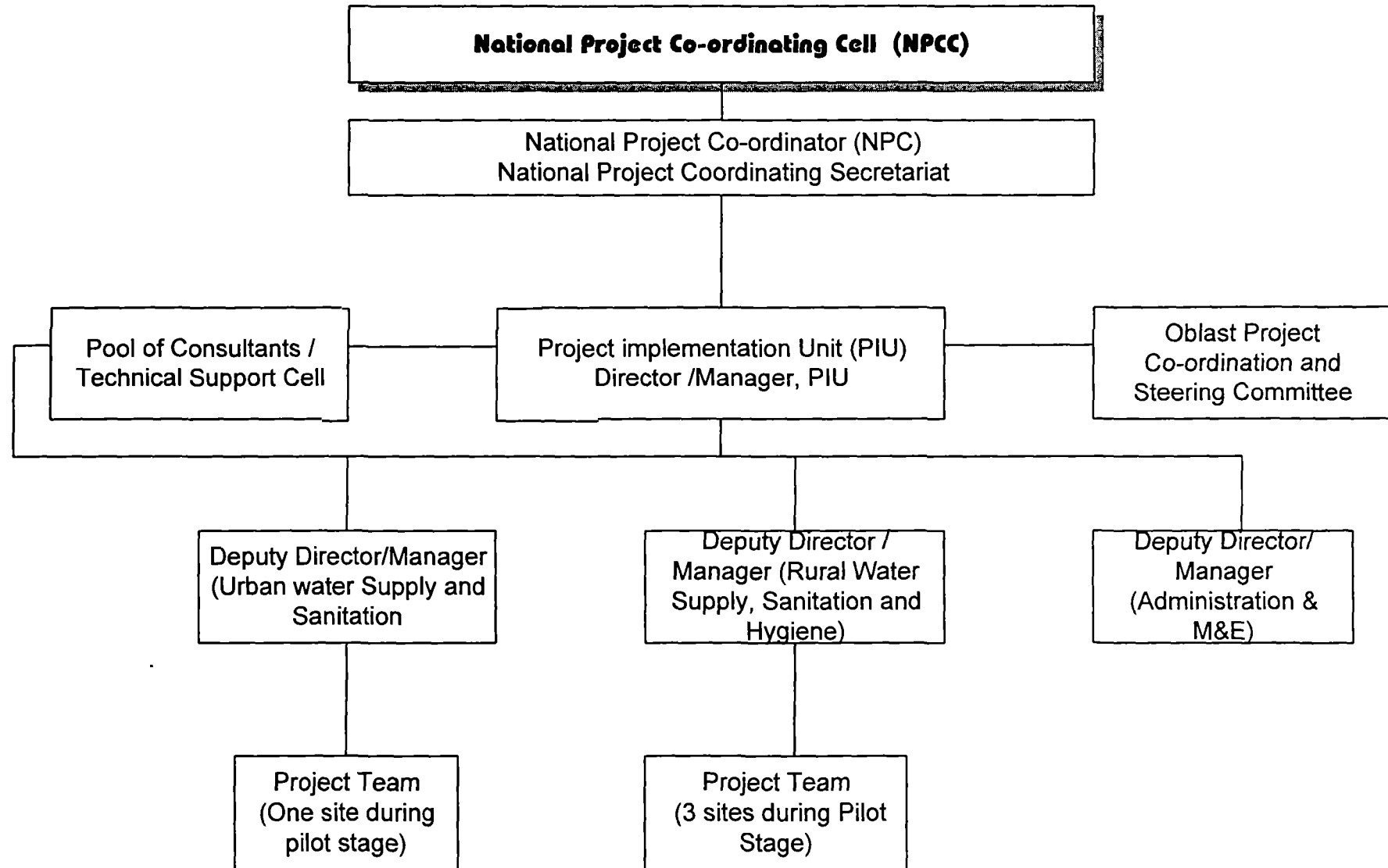


Figure V

Overall Organizational Structure of the Project





2.6.2 Coordination of the Project Activities

It has therefore, been agreed with the authority of government of Kazakhstan to set up

- a. National Project Coordinating Cell (NPCC) at national level and
- b. Oblast Project Coordinating and steering committee (OPCSC) at Oblast Level,

to ensure effective coordination of project activities

a. **National Project Coordination Cell (NPCC)**

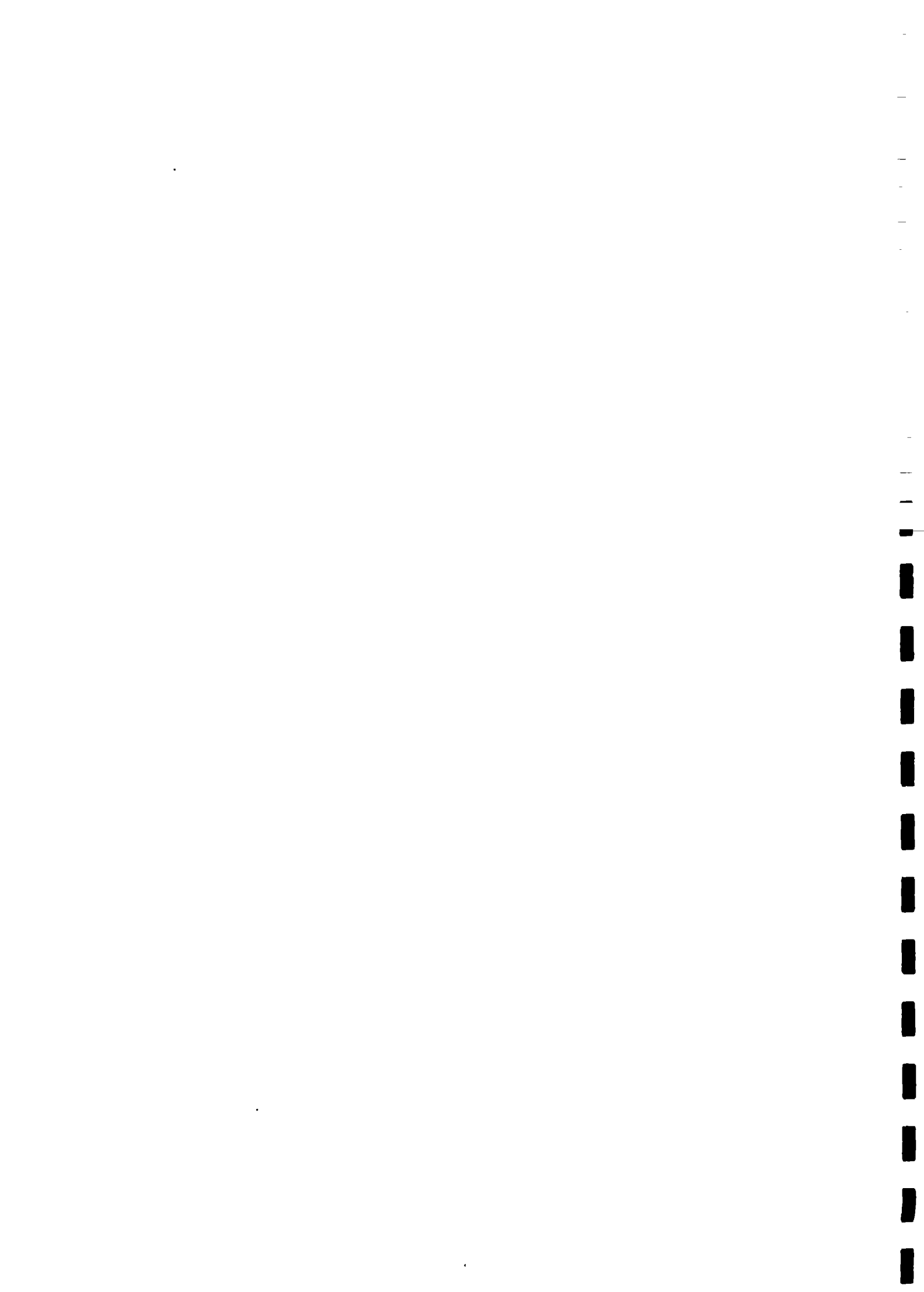
The NPCC would be set up at the state committee for water resources which is the highest policy making and operational body for water resources management at national level.

Having considered the crucial vitality of national level inter agency coordination as this project would involve policy changes, it has been agreed that the NPCC would be headed by the Chairman of State Committee for Water Resources. NPCC should have representation from the main national agencies responsible for water supply, sanitation, health and finance such as ministries of housing and communal services, health, finance and economic affairs/planning etc.,

The National Project Coordinator agreed to be appointed shortly will function as the secretary to NPCC Cell.

The role and function of the NPCC would be

- i. Overall responsibility for setting goals, decide targets, approve guidelines and procedures of the project in consultation with the World Bank and the Oblast administration during the period of project preparation.
- ii. Liaison with the World Bank and other agencies at National level.
- iii. Attend to all procurement of services and goods that need international bidding, for the implementation of the project.

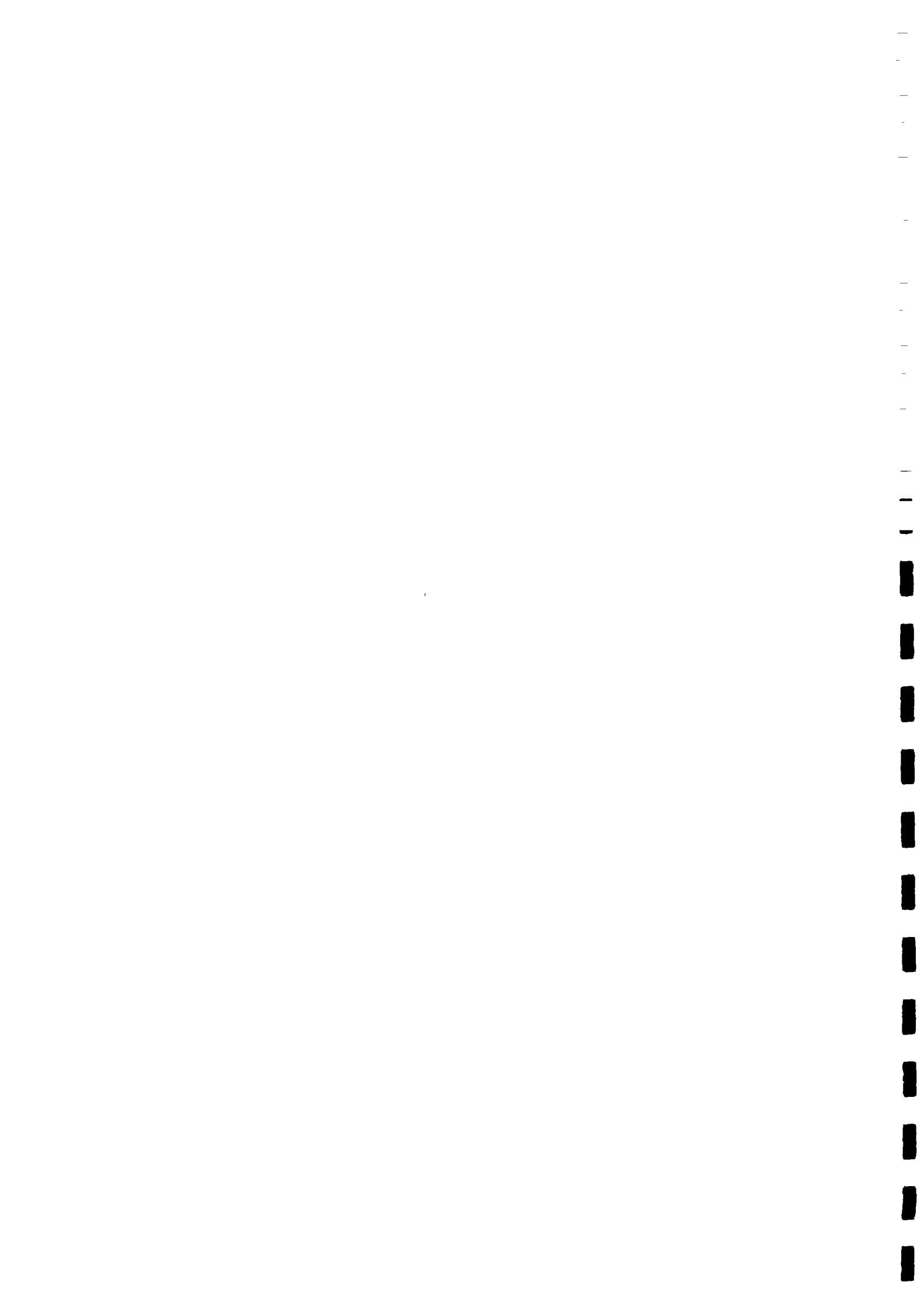


- iv. Providing necessary assistance and guidance to Oblast level
- v. Overall physical and financial progress monitoring, obtain periodical progress report eg., monthly, quarterly of PIU, review them and forward them to the World Bank.
- vi. Policy review and formation if and when necessary.
- vii. Liaison with Ministries of Finance, Policy and Planning, Housing, Health and other relevant institutions at National Level.
- viii. To provide advice and guidance on any matters referred by the PIU or OPCSC

It has also been agreed that a proposed NPCC secretariat would provide necessary logistical support and secretariat facility to the NPCC. This secretariat should comprise not more than 2 full time key officials including the National Project Coordinator. The second officer should be from the field of finance, economics or sociology. Other necessary backup services such as logistic, financial and secretarial etc., should be provided by the State Committee for Water Resources (SCWR). The NPCC secretariat will be housed at the office of SCWR.

The TOR of the national project coordinator is as follows.

- 1. Overall management of the NPCC secretariat reporting to the chairman/ NPCC
- 2. Liaison with ministries and other agencies of National level and the World Bank
- 3. To serve as the Secretary to the NPCC.
- 4. Overall progress monitoring review of reports received from PIU etc.,
- 5. Ensure conformity of the project activities with the accepted project design and policy framework.



6. Coordinate all project preparation activities with relevant agencies at National, Oblast and Raions levels.
7. Attend to all procurement of services and goods that need international bidding.
8. Provide all assistance to the Chairman/ NPCC and attend to all follow up actions taken by the NPCC.

b. Oblast Project Coordinating and Steering Committee (OPCSC)

Oblast level is the most important level in project implementation as the project activities are implemented within the Kyzl Orda Oblast and most of the agencies involved in project implantation are located there. Therefore, Oblast Level coordination and steering mechanism needs to be established during the project preparation period. It has been agreed that this committee should function under the chairmanship of Deputy Secretary of Kyzl Orda Oblast who is the chief officer incharge of the water supply and sanitation at project level. This committee would be made up of the representatives of the all relevant agencies at Kyzl Orda oblast and Aral and Kazalink regions

Secretariat functions for this committee would be provided by the Project Implementation Unit (PIU) while the Director PIU to serve as Convener/Secretary to the committee.

The main functions of the committee would be

- a. Inter agency coordination at Oblast level
- b. Liaison with national agencies of interest through NPCC
- c. Provide necessary assistance and guidance to the PIU.
- d. Overall physical and financial monitoring of project financial at oblast level.
- e. Ensure conformity of the project activities with approved plans, programmes and policies.
- f. Approve technical criteria
- g. Planning and establishment of project review criteria.



c. Project Implementation Unit (PIU)

The inevitable conclusion could be made out of the results of the findings of the Mission, as described in the previous section of this report is to establish a Project Implementation Unit at Oblast Level. The project has been designed to implement various activities that cut across legitimate boundaries of existing institutions at various levels. Further more the project expects to adopt demand led community based participatory approach in providing rural water supply. Therefore, it was agreed that given the innovative nature and the wide scope of the project that there must be a new administrative unit on temporary basis which is capable for performing the critical role of implementation of sum of the project activities directly while undertaking a role of a facilitator or promoter to strengthening the institutional capabilities of agencies involved in the field of rural water supply, hygiene education and sanitation.

It has therefore been agreed that the project implementation unit will be setup within the Kyzl Orda Oblast administration under which main agencies involving in water supply and sanitation function.

During the formative stage the PIU will consist of its Head (Director) and at least three key staff members .

The roles and functions of PIU would be to implement the project including

- a. Prepare sub-projects, test and review the project approach;
- b. Implement Pilot Projects, and document lessons learned
- c. Procure goods and services required for the implementation of project activities;
- d. Monitor project activities and prepare progress reports;
- e. Undertake all planning and design activities and ensure smooth and effective implementation;
- f. Overall project coordination
- g. Attend all financial dealings of the project; and
- h. Liaison with all relevant agencies.



2.6.4 Responsibility of Key Staff Members

The responsibilities of the key staff members of PIU are given below:

a. Director/Manager -PIU

- ◆ Overall management of the project, reporting to the Chairman
- ◆ Oblast Co-ordination and Steering Committee
- ◆ Liaison with respective agencies involved in water supply, sanitation and health at Oblast level.
- ◆ Liaison with co-ordination of activities of National Project Co-ordinating Cell(NPCC) and its Secretariat
- ◆ Assessment and allocation of budget for project activities.
- ◆ Monitoring all activities of project performance.
- ◆ Ensure conformity of the Project activities with approved policy plans and procedures
- ◆ Personnel management of PIU staff
- ◆ All activities pertaining to planning and programming of the project.
- ◆ Secretary to the OPSC

b. Director/Manager- Urban Water Supply

- ◆ Formulation and monitoring of appropriate technical standards for Urban Water Supply and Sanitation Projects
- ◆ Liaison with all agencies involved in water supply and sanitation pertaining to technical issues.
- ◆ Budgetary and cost control of hardware investments.
- ◆ Formulation and review of technical criteria, guidelines, procedures and service levels.



- ◆ Development and technical innovation to reduce cost and respond to specific technical needs encountered.
- ◆ Formulation and supervision of the water quality control programme.
- ◆ Overall in charge of Pilot projects implemented in urban areas and formulation and review of project targets.
- ◆ All activities pertaining to urban water supply and sanitation.

c. Deputy Director/Manager- Water Supply

- ◆ Planning and execution of Pilot Project adopting community based approach
- ◆ Planning and executing public awareness and hygiene education programmes designed to reinforce the project activities.
- ◆ Develop methodologies, systems and procedures for rural water supply schemes to be implemented with active community participation.
- ◆ Liaison with other relevant agencies for the improvement of rural water supply and sanitation projects and programmes.
- ◆ Overall monitoring of rural water supply & sanitation projects and programmes.

d. Deputy Director /Manager - Administration and M & E

- ◆ Overall in-charge of all administrative matters in PIU including procurement of goods and services.
- ◆ Establish and supervise the collection and transmission of data required for MIS.
- ◆ Liaison and co-ordinate with other agencies in the establishment of data bases on Urban Water Supply and Sanitation as well as on rural water supply and sanitation services.
- ◆ Preparation of progress reports, budget and plans.
- ◆ In charge of all matters pertaining to the Financial accountability, cost, recovery and tariff.

