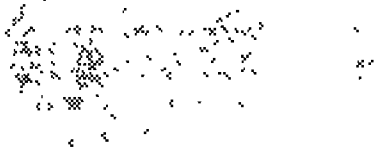
MISSION REPORT

CENTRAL ASIAN REPUBLICS &

KAZAKHSTAN



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RAPID ASSESSMENT OF THE SITUATION WITH RESPECT TO WATER, SANITATION AND THE ENVIRONMENT IN KAZAKHSTAN

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KAZAKHSTAN

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1. EXECUTIVE SUMMARY

Many government organisations in Kazakhstan are involved in the provision of water supply and sanitation services. The overall situation with respect to urban water supply and sanitation is satisfactory apart from increasing problems in the procurement of pipes and suitable mechanised pumps. The cost of sewerage is extremely expensive which prohibits acceleration of service coverage levels in cities and towns since no other technical alternatives are presently considered. The situation with respect to rural water supply and sanitation is somewhat more complex since there is no clear overall plan of action for provision of services and there are many government agencies involved. There are financial constraints in accelerating service coverage, especially for rural sanitation, since there is no government budget presently allocated. Rural water supply coverage is 51 per cent and the government feel that there is the capacity to provide full service coverage by the year 2000 if additional financial resources are made available and overall management and coordination is improved.

Environmental sanitation conditions are poor in the rural areas and consequently there is clearly a need for development of a programme that addresses this problem. There are serious environmental problems in the Aral sea region and, as a result, the government is giving more focus to providing services in this area. Water quality is closely monitored throughout the country both for bacteriological and chemical content. Contamination due to both is a problem in specific areas, especially chemical contamination due to nitrates in some regions. Agro-chemical levels are also monitored in problem areas.

The water supply and sanitation coverage rates for 1991 were the following[1];

	Coverage
Total Water Supply	70%
Urban Water Supply	85%
Rural Water supply	51%
Urban Sanitation	70%
Rural Sanitation*	10%

(* Estimate obtained from the Ministry of Health and Agriculture since official figures unavailable)

There is a need for more recent technical information to be shared with the government through literature and exchange visits. It is recommended that a seminar be held for rural water supply and sanitation technologies early next year to start this process.

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[1] Official Figures Obtained from Ministry of Health and Water Supply Corporation, Alma Ata.

Capacity building is necessary through improved sector coordination and planning methods.

Research and development activities can be encouraged through identifying suitable institutions in Europe and Asia to assist. A well developed rural and peri-urban sanitation programme is needed to improved conditions and the presently very low coverage rates.

It is recommended that UNICEF for the period 1993-94 initiate three projects. The first would be for an improved technical communication network consisting of development of international linkages with major institutions and updating of technical methods used to improve cost effectiveness and accelerate service coverage. Linkages could be made with the International Reference Centre, the Netherlands and other suitable institution such as the All India institute of Public Health, Calcutta, for exchange visits and provision of relevant information. Both the ministry of Health and Agriculture agreed to holding a two-three day seminar in early 1993 for cost-effective technologies for rural and peri-urban areas. Various international agencies and private organisations would be invited to attend to demonstrate models and share information.

The second project would be for capacity building of government departments and would include improved planning methods, development of human resources and improvement of data management systems.

The third project recommended is for sanitation in peri-urban and rural areas. This would primarily be a very small demonstration project to introduce low cost methods for sanitation including pour-flush latrines on a pilot basis. There would also be a research component to investigate existing beliefs and practices. It is suggested that collaboration be investigated with UNCHS Habitat who have been involved in installation os small bore sewer systems in many countries and may consider funding projects in these countries.

1.1 URBAN WATER SUPPLY

1.1.1 Present Situation

Urban water supply is managed and coordinated through the Ministry of Communal Services. In the capital city of each Oblast there is a Water Supply Corporation responsible for both piped water supply and sewerage which answers to the Ministry of Communal Services. It is estimated that all cities and towns have piped water supply. However actual coverage of the total urban population is estimated to be 85[2] per cent. The design factor for per capita use is 250 litres/person/day and the water is metred to all houses.

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[2] Official Statistics, Water Supply Corporation, Alma Ata.

People pay for water in all cities and towns, the amount varying according to Oblast regulations. In Alma Ata people pay 12 kopeks per cu.m.. However the cost for industrial use is 13.45 roubles per cu.m. The real cost of provision of water is 4.8 roubles per cu.m. and the Alma Ata Water Supply Corporation estimates that their costs are just covered by incomes generated mainly by the industrial sector.

Steel, iron, and PVC pipes are used for city and town water supplies. There is a major problem with corrosion of iron and steel pipes. Both steel and PVC pipes are imported from Russia, though prices have been accelerating rapidly in the past two years. Both submersible and centrifugal pumps are imported from Moldavia. Recently there has been problems in procurement due to production difficulties.

In Alma Ata, approximately 70 per cent of the water is from groundwater and 30 per cent from the mountains. Tubewells are installed at a depth of 150-200 metres. There is a treatment plant for the water taken from mountain streams where it is filtered and chlorinated. Each day one million cu.m. of water is provided for the population of 1.6 million. However this is for both domestic and industrial use. The mountain water is tested for faecal coliform before and after treatment. Chemical testing is also performed after treatment including iron, magnesium, sulphides, chlorine, pH, colour, odour, taste and turbidity. There was a problem of groundwater pollution in some of the city areas which warranted the installation of deeper tubewells.

1.2 URBAN SANITATION

Of the 50,000 cities and towns, only 500 have sewerage systems serving all of part of the population. Urban sanitation is estimated at 70 per cent. There are serious limitations in provision of sewerage systems due to the very high installation costs.

It is estimated 65 per cent of private houses are connected to the sewerage system and 85 per cent of all industries and government buildings. Inaccurate figures were available for the actual population covered but it is estimated to be approximately 70 per cent. In the cities and towns that have sewerage, there is a sewage treatment plant consisting of a series of lagoons, thereafter being discharged into rivers and streams after the biological oxygen demand (BOD) is reduced to an acceptable level.

The pipes used for urban sewerage are large diameter iron, asbestos cement, and concrete pipes. Sewage output is metred and the costs are 6 kopeks per cu.m. for private houses and 5.6 roubles per cu.m. for industrial use.

For those areas without sewerage, special trucks are provided to empty pit latrines when these are full. However this information was collected for Alma Ata only, and it is unsure if this facility is available in all towns.

Garbage disposal is managed through the Ministry of Communal Affairs and is usually collected once a week from government owned containers. In Alma Ata, it is taken to a refuse dump outside of the town.

1.3 RURAL WATER SUPPLY

The Ministry of Agriculture describes rural water supply as a **'child without a mother'** with little leadership or direction.

Only 51 per cent[3] of the rural population have piped water supplies. The rural population is 38 per cent of the overall population or approximately seven million. Of this, it is estimated that there is still 3.4 million people to be served. Approximately 23 per cent of the rural population use water from wells and locally produced handpumps, 5.7 per cent receive water from tankers and 20 per cent use rivers and other surface water sources[4]. Piped water in the rural areas is usually provided by standposts. However people can have a standpost in their compound if they pay and sufficient water is available. Approximately 15 per cent of the rural population have a house connection.

The design standard for the provision of rural water supply is 125 litres per person per day. However, in practice, this is not the average. In many areas people are only receiving 10-15 litres per day, since in some cases only sections of the villages may be served. Approximately 2325 villages have been served with rural water supplies out of a total of 10,000 villages. These villages were selected on the basis of serving those with the largest population first.

Rural water supplies are constructed through the Ministry of Agriculture and the Ministry of Water Resources. In addition, the collective farms also construct systems which they pay for directly. The systems constructed through the Ministry of Water Resources are mainly large water supply systems consisting of several pumping stations and laying of large diameter pipes (in places up to one metre dia.) serving mainly for irrigation purposes. The water supply department of the Ministry of Agriculture connects the villages both to the pipes laid by the Ministry of Water Resources, in addition to constructing their own smaller systems. All drilling activities for both departments is conducted through the department of hydrogeology who have all the relevant

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[3] Official Statistics, Department of Sanitation and Epidemiology, Ministry of Health, Alma Ata (Appendix VT/01)

[4] Government Statistics, Department of Sanitation and Epidemiology, Ministry of Health, Alm Ata.

hydrogeological information and have an office in each Oblast with suitable drilling rigs and equipment. The cost for drilling is an average of 1000 roubles per metre (US$250.6)[5] depending on the hydrogeological conditions.

The water supply systems are designed by both the Ministry of Water Resources and Agriculture. However, in practice detailed designs are only made for the systems built directly by the water supply department of the Ministry of Agriculture. The Ministry of Water Resources are only responsible for the laying of the pipes and it is the financial responsibility of the Ministry of Agriculture and the collective farms to pay for the piped connections.

Up to five years ago, the Ministry of Agriculture used to prepare a central plan for the provision of rural water supplies. However now each oblast prepares their own plans through the departments offices at the Oblast level and no plans are produced centrally. These include details for the types of systems to be constructed, population to be served etc. Although this has assisted decentralised planning, there are still problems with coordination and support to Oblast level. Also many of these plans have failed to adhere to their implementation schedules due to lack of financial resources. The main problem areas for rural water supply are the Aral sea region and East Kazakhstan due to the major environmental concerns.

The budget in 1990 for the department was 60 million roubles (US$15,037,593). In addition 10 million roubles (US$2.5 million) is available in each Oblast. The Ministry of Water Resources has their own budget for rural water supply and irrigation which is estimated at 30 million roubles per annum. It is estimated that the per capita cost for water supply is in the region of 3000-5000 roubles. Payment is made for provision of water. The cost was 20-30 kopeks per cu.m. about 2 years ago. The cost has now increased to 2-3 roubles per cu.m. litres and these costs are usually paid by the collective farms.

The types of pipes used are polyethylene, asbestos cement and steel. A small quantity of poly vinyl chloride (PVC) and polyethylene pipes are used since they are difficult to obtain. There is a major problem of corrosion of pipes similar to the urban sector, which is the greatest in the northern regions. Each rayon has its own maintenance programme, however the budget is very limited. The pumps used, primarily submersibles and centrifugal pumps, are procured from Moldavia and the department is also suffering from a shortfall in supplies.

The department estimates that it is providing water to the rural areas at a rate of 2-3 per cent per annum due to its budget limitations. However it is felt that accelerating coverage is also dependant on improved management and coordination. The Ministry

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[5] Official government exchange rate is 1US$ equivalent to 3.99 Roubles.

of Water Resources estimate that they lay 10kms of pipe each year to which connections are made by the Ministry of Agriculture and the collective farms.

In some villages visited, even when piped water supply was provided people are using locally produced handpumps due to breakdowns in the government-provided systems and insufficient water. However these pumps frequently break and are locally repaired by collective farm mechanics.

1.4 RURAL SANITATION

This is a serous problem throughout the country. The definition of sanitation is a connection to a sewerage system, though no rural villages have sewer connections. In most villages people have simple pit latrines constructed outside of the houses consisting of a pit of 1-2 metres and a wooden superstructure. When the latrine is full, the pit is usually emptied manually or a new pit is constructed. After discussions with households, it appears that an improved means of excreta disposal is not seen as a major priority. Houses were visited where people obviously were relatively well off with a television and car. However they usually only had a simple pit latrine[6].

One of the major problems has been that there is no government budget or department responsible for improving rural sanitation conditions. This has resulted in a general lack of motivation and interest on behalf of the household. Most people, when asked in both Kazakhstan and Kyrgyzstan, stated an interest in having a sewer connection but were unaware of any other alternatives that may be suitable.

The overall sanitary conditions are poor. There is no formal system of garbage disposal and most people compost household refuse. An acute problem is the shortage of soap which is also very expensive (sometimes as high as 70 roubles per kg). In the few houses visited, soap was unavailable. If there is a household water connection, there is usually no hygienic washing area or adequate drainage. Usually a connection is made by the department and a drainage pipe installed. For the public connections, a standpipe is installed only and no platform is constructed.

The Ministry of Health expressed concern regarding the situation but were unaware how to resolve the problem without a significant financial investment which is presently unavailable.

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[6] Field visit by Mission Team, Chitik Rayon, 22 October 1992.

1.5 ENVIRONMENTAL HEALTH ASPECTS

1.5.1 Monitoring of Water-Related Diseases

This is managed by the Ministry of Health through the department of Sanitation and Epidemiology. There is a central laboratory at Alma Ata which is responsible for collation and analysis of data collected from the Oblast and Rayon level. The functions of these stations include detection of infectious disease epidemics, management of the vaccine cold chain, laboratory testing for water quality and pollution, monitoring of water supply coverage rates, food hygiene inspection, health prevention and promotion actions and epidemiological data collection and analysis. There are 19 stations at the Oblast level and 306 at the Rayon level. Each week monitoring records are collected from the Oblast level after they have been collected from the Rayon level. The 19 oblasts send information to Alma Ata to the Central Station where the data is collated on computer and analysed. The laboratory has five computers with trained operators. The central laboratory also conducts testing for specific bacteriological and viral agents. However this is not performed at the Oblast and Rayon levels.

The incidence rates for water related diseases including diarrhoea, typhoid, cholera, helminth infections and hepatitis are recorded weekly at the rayon level. The figures for diarrhoea cases for 1990 and 1991 are given below. However it should be noted that these are the figures for infectious diarrhoea cases which have been diagnosed according to a causative agent e.g. rotavirus, bacillary dysentery etc. and are not for all cases, which are classified in Kazakhstan as gastro-enteritic diseases.

YEAR	TOTAL CASES	RATE PER 100,000	CASES UNDER 14 YEARS	RATE PER 100,000
1990	69,037	414	46,863	883
1991	69,400	413	47,163	880

Table 1: Number of Cases of Infectious Diarrhoea during 1990 and 1991.

Apparently 70 per cent of the total diarrhoea cases occur in under fourteen and 60 per cent in under fives. Another major problem is hepatitis A which has a high incidence rate in all oblasts. The results are included in Table 2.

YEAR	TOTAL CASES	RATE PER 100,000	CASES UNDER 14 YEARS	RATE PER 100,000
1990	79958	480	62023	1169
1991	61566	366	46251	862

Table 2: Number of Cases of Hepatitis during 1990 and 1991.

The incidence rates for other water-related diseases are much lower. The rate for typhoid was 2 per 100,000 in 1991. The rates for helminth infections are also very low. However there is some trichuriasis.

1.5.2 Water Quality Control

Water samples are tested from both surfaces sources and from water supplies in rural and urban areas. Samples are collected at the Rayon level and transported to the laboratory where they are analysed for bacteriological and chemical content. Russian standards are followed (1982) . A copy of the WHO Drinking Water Quality Standards for 1972 only were available at the Ministry of Health. There are two sets of standards for surface water and drinking water supplies. All the laboratories use the multiple tube analysis for bacteriological testing. Samples are transported to the laboratories as quickly as possible. However incubators are frequently not used for this purpose since the equipment is not available and it can take up to a day to transport these to the Sanitation and Epidemiology stations at the Rayon level.

The Russian standards specify that all groundwater sources are tested after exploitation not less than four times in the first year and thereafter, once every year. Water supply systems using surface sources should be tested at least once a month. Before distribution the drinking water quality is analysed according to microbiological, chemical and organic characteristics. Samples are taken from the street standpipes, from the highest points in the water mains and random branchlines. Samples are also taken from tapstands in compounds and reservoir tanks. The Ministry of Health states that 6.6. per cent of all water is bacteriologically contaminated. In 1980 the level was 17.6 per cent.

The Central Sanitation and Epidemiology Station trains staff from the other laboratories. Five to six trainings are conducted each year, each for 20-25 people for approximately 10 days. The training includes sampling of water specimens, food sampling, investigations of outbreaks etc.

Nitrate levels are measured, since in some areas this has been a problem due the use of chemical fertilisers and pesticides High levels of nitrates in drinking water can lead to serious or fatal consequences for infants under six months since the nitrates are reduced to nitrites in the body thus leading to methaemoglobinaemia, which reduces the oxygen carrying capacity of the blood. The Ministry of Health stated that this was only a problem in the Aral sea region where nitrate levels are being closely monitored since due to the use of excessive fertilisers and pesticides.

1.5.3 Environmental Pollution

Clearly the region of main concern is that of the Aral sea. Forty years ago the sea was active with fish. The countries primarily affected are Turkmenistan and Uzbekhistan. However the Aral sea region in Kazakhstan is badly affected and is now receiving increased attention from the government.

Extensive irrigation works mainly as a result of the cotton grown in Uzbekistan and Turkmenistan, and intensive agriculture over the past 20 years, with excessive use of fertilisers and pesticides have caused advance pollution of groundwater, reduction in agricultural yield and extensive salinisation. This has adversely affected the Aral sea region in Kazakhstan where now extensive monitoring of ground and surface water pollution is undertaken by both the Ministry of Health and other special development projects.

Before the decline of its water level, the area of the Aral sea was 68,320 km2. Its water volume was about 1066kcu.m.. The maximal depth was 69 metres. Mineralisation was 10-12 per cent. However, the volume has now shrunk by two thirds. Some of the important consequences of water balance variations include the following[7]:

(1) A rise of the ground water table on and near irrigated land with insufficient drainage, as well as near canals and the main drains. this results in salinisation and water logging of soils, and subsidence of surface structures;

(2) A sharp increase in the discharge of high mineral content drainage water to rivers. The pesticide and mineral fertilizer content of these waters leads to deterioration of river water quality.

(3) The formation of new discharge lakes in closed depressions where drainage water from irrigated lands are discharged.

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[7] Diagnostic Study for the Development of an Action Plan for the Aral Sea, UNEP Expert Working Group Report, 1992.

(4) A decrease in the river water inflow to the Aral sea which caused a decline in the water level, decrease in area and volume, increase in salinity, disruptions of the sea ecosystems. This in turn resulted in climatic changes.

(5) All the above have caused a change in and in most cases deterioration of, living conditions for the areas population. Economic activity has also been made more difficult.

The long term solutions will require considerable investment with a transformation of the regions economic development from cotton dependency. However it should be noted that only two per cent of the land in Kazakhstan is devoted to cotton growing the problems are much greater in Uzbekistan and Turkmenistan. The department of Health developed a legislation for the Aral sea region which was passed by the government which prohibits environmental pollution by both industry and individuals. An action plan is presently being developed by the United Nations Environment Programme (UNEP) in order to combat the rapid degradation of the area.

Another major problem in Kazakhstan has been the dumping of radioactive wastes because the Republic lacks suitable facilities to bury the waste. The only burial ground is situated by Alma Ata and belongs to the nuclear physics research laboratory, though it cannot be used extensively as it is not waterproof, according to experts. Consequently radioactive wastes have been dumped in different areas and government officials are often unable to locate it.

According to Kazakh radio, the Semipalatinsk Oblast has been declared an ecological disaster zone as a result of nuclear testing.

2. IDENTIFICATION OF MAJOR PROBLEMS AND POTENTIAL SOLUTIONS

2.1. LACK OF MOST RECENT TECHNICAL METHODS IN WATER SUPPLY, SANITATION AND WATER QUALITY CONTROL FOR BOTH RURAL AND URBAN AREAS

2.1.1 Underlying Causes

There has been no effective channels for inter-action and exchange of information with organisations and manufacturers outside of the USSR. The government has been provided very little information of new technical developments. There are few outside subscriptions to international technical magazines. Visits from other multi-lateral and bi-lateral agencies are only now commencing. The government

has little or no information of international organisations and private sector companies, their roles and what type of technical support is available.

2.1.2 Basic Causes

Many government departments have been involved in the provision of water supply and sanitation services. However there has been limited inter-action since each had a defined role which was established by central government. There budgets were established and approved through Russia and each had their own clear procedures for construction and installation of facilities. Technology selection was based on available resources in the republic and supplies and equipment provided by other Russian republics. For example steel, PVC pipes and centrifugal pumps were procured from Russia and Moldavia. Due to establishment of standard practices and norms for Russia, there was never a great need for improvement and technical information exchange with other countries outside of the USSR.

2.1.3 Long Term Solutions

The government will need to systematically review their technical procedures for both procurement and construction to upgrade technical methods and incorporate new technological developments for both provision of water and sanitation services and monitoring of drinking and surface water quality. Some examples are increasing the use of PVC and polyethylene pipes for new water supply systems which are cheaper, easier to lay and safer than asbestos cement pipes which are both dangerous to manufacture and lay; the introduction of small bore sewer systems for small towns instead of large diameter sewer pipes which are very costly; introduction of solar pumping systems for more isolated communities; introduction of pour-flush twin pit toilets for rural and peri-urban areas; upgrading of water quality testing methods and equipment; improvement of irrigation methods in environmentally polluted agricultural areas; upgrading training curricula for technical staff and develop research projects based on current needs in collaboration with International Research Centres.

Attention needs to be given to more cost effective design of systems thus selecting technical options, based on population to be served, hydrogeological conditions, availability and cost of electricity and diesel and ease of operation and maintenance in rural and more remote areas.

More up to date supplies and equipment will need to be procured from outside of the USSR through foreign exchange. Since Kazakhstan has a greater capacity to earn foreign exchange, this will not be such a great problem as in the other

Central Asian Republics. However initially assistance will be needed from major donors to procure more up to date equipment.

Capacity building is necessary in local production of relevant supplies and equipment rather than continue to procure from the USSR or start to purchase from overseas. This will involve large investments from major international donors and technical guidance and expertise. For example PVC pipe manufacturing could be established by inviting relevant companies such as Wavin or manufacturers from India or South East Asia to visit Kazakhstan and evaluate the potential for pipe manufacturing. Apparently there is a carbide production factory in one of the major cities which could be upgraded to manufacture polyvinyl chloride. However a thorough assessment needs to be made of the potential and investment needs for this purpose. The pipes could then be used for both new rural and urban water supply systems.

There is also a problem in manufacture of submersible and centrifugal pumps that could be addressed by inviting KSB or other pump manufacturing companies to assess the potential of local production and the investment necessary to upgrade existing industrial plants to produce enough pumps to meet the needs of the country.

2.1.4 Short Term Solutions

The government should be exposed to new ideas through provision of literature and exchange visits. A meeting was held with the Ministry of Agriculture to discuss the holding of a national seminar to share new technical information and invite international companies and donors to generate interest (Appendix III).

2.1.5. Potential Partners

Major investments would need to be made to locally produce relevant supplies and equipment in country. World Bank, USAID, EEC and other bi-lateral agencies may be potential donors for such activities. UNICEF could assist in identification of potential allies and partners and preparation of project proposals for large scale investments.

In addition small scale support can be given for improved information networks.

2.1.5 Strategies

For urban water supply and sanitation, information can be shared and potential partners and manufacturers encouraged to visit the country to assess needs and commence production of relevant supplies and equipment. Effective

communication channels can be developed for information exchange through provision of literature and arrangement of exchange visits.

Workshops, seminars and trainings can be arranged for sharing information of new technical developments, construction methods and recently developed techniques.

Assessment of manufacturing capacity of relevant supplies and equipment in country through identification of suitable companies in Europe, Asia and the USA who can support this process with large scale donor funding.

Development of small scale demonstration projects to show the improved cost-effectiveness of introducing new drilling and construction methods.

2.2 NEED FOR CAPACITY BUILDING TO ACCELERATE COVERAGE RATES TO ACHIEVE THE GLOBAL GOALS OF UNIVERSAL ACCESS TO WATER SUPPLY AND SANITATION BY THE YEAR 2000.

2.2.1 Basic Causes

There has been limited systematic planning and coordination of sector activities due to involvement of several government departments and sometimes unclearly defined roles, especially in the rural sector.

There is no effective decentralised method of data collection at the Rayon and Oblast levels by any government departments. The Ministry of Health has been collecting data for water supply coverage rates collected through the Sanitation and Epidemiology stations at the Rayon level. The Ministry of Communal affairs has been collecting information on water supply and sanitation coverage level through the town and city water supply corporations. However for rural areas, data collection has been difficult since in many areas only sections of villages have been served and frequently systems are no longer functioning.

2.2.2 Underlying Causes

Many government organisations have been involved in provision of water supply and sanitation services for both rural and urban areas. Definitions of coverage are not well defined and different government departments are using different standards. For example, in some cases water supply access has been defined as a standpost in the household compound. However the Ministry of Health has used the definition of piped water supply provided at a minimum through public standposts.

There has also been the problem of service delivery for the rural areas focussing on the provision of water for irrigation purposes. This has consequently lead to less emphasis on adequate delivery of services to households.

2.2.3 Immediate Causes

Staff have received little training or technical assistance in improved sector planning and management. There has been limited scope for human resource development. Government organisations are unaware of what the other is doing due to lack of effective communication channels.

Training is also lacking in effective data collection methods and how to use this information efficiently for improving service delivery and coverage rates.

2.2.4 Long term solutions

One Ministry or Department should be made responsible for the overall coordination and management of water supply and sanitation activities. This department should develop an effective decentralised monitoring system for data collection.

For water supplies, the existing definition of coverage can be reviewed to see if it is realistic in terms of access and quantity of water to be made available at the household level. For peri-urban and rural sanitation, new definitions of service coverage may need to be developed based on improved cost effective methods and replace the definition of a household connection to a sewer system which is extremely expensive.

2.2.5 Intermediate and Short Term solutions

The different government departments should meet regularly to define access for both rural and urban areas and share relevant information in terms of service coverage.

The Ministry of Health could be made responsible for improved sector monitoring since data collection is already conducted at the rayon and oblast level for water supply coverage and water quality. There are many staff available at the Sanitation and Epidemiology laboratories that can be trained in improve data collection through courses conducted at the central level.

2.2.6 Strategies

a) capacity building of government departments in more effective planning and training of suitable staff.

b) establishment of clear national plans of action with yearly objectives and targets to measure sector performance.

c) appointment of one ministry responsible for the coordination of sector activities.

2.3 NEED FOR RESEARCH, TRAINING AND DEVELOPMENT ACTIVITIES FOR WATER SUPPLY AND SANITATION AND ENVIRONMENT IN RURAL AREAS.

2.3.1 Basic Causes

The government has received limited financial support for research activities and there are few opportunities for training both in and outside of the country.

2.3.2 Underlying Causes

Due to dependance on Russia for technical information and recent development, there was never an expressed need for improved research and training. However, due to the changing needs of the country, research and development activities have become more important, especially for the development of improved technologies and research into environmental pollution.

2.3.3 Immediate Causes

The government has little information regarding which research institutions and bodies it can call on for support. It also has not clearly identified what research and training activities are needed.

2.3.4 Long Term Solutions

The government will need to develop suitable research institutions, especially for major environmental problems, that can identify and monitor necessary interventions that need to be taken.

2.3.5 Short Term Solutions

Suitable research institutions can be identified in Europe, USA and Asia that can assist in the develop of research activities for water, sanitation and the environment and develop training courses for sector staff.

2.3.6 Strategies

a) Identification one to two key institutions in Europe or Asia and arrange exchange visits between countries. The International Reference Centre (IRC) the Hague, is one suitable centre.

b) Development of suitable research proposals that can be funded either national or through donor support.

c) Identification of suitable trainings courses where government staff can be trained.

d) Development of training courses in country through strengthening of existing institutions.

2.4 POOR ENVIRONMENTAL SANITATION CONDITIONS ESPECIALLY IN RURAL AREAS

2.4.1 Basic causes

No government organisation has responsibility for rural sanitation. The government are unaware of more cost effective alternatives to sewer systems, especially for rural areas.

2.4.2 Underlying causes

Due to financial constraints, rural sanitation was never considered a high priority and, since there was no major demand, there was no pressure on government to meet the people's needs.

2.4.3 Immediate causes

There is no expertise or experience in the development of rural or peri-urban sanitation programmes.

2.4.4 Long Term Solutions

A detailed plan of action is needed for environmental sanitation to include yearly targets, technology selection, financial resources necessary to achieve established objectives. Increased financial resources are needed for both rural and urban sanitation. This may need to be generated from external resources due to the deteriorating financial situation in the country.

One department needs to be identified to be responsible for rural sanitation as no one has presently been given this responsibility. The most suitable Ministry is Health since they are responsible for monitoring of rural sanitary conditions, however, have no budget to assist households in latrine construction.

2.4.5 Short term solutions

Small pilot projects should be developed in both peri-urban and rural areas to demonstrate low cost methods for sanitation. Government staff should be exposed to experiences in other countries. Likewise suitable personnel from other countries could be invited to visit to assess the situation.

2.4.6 Potential actors

For long term solutions, funding should be sought from the World Bank, EEC and other major donors. For intermediate and short term solutions, support should be sought from UNICEF, International Research Centres, bi-lateral and multi-lateral donors.

2.4.7 Strategies

a) Development of demonstration projects in selected problem areas especially the Aral Sea Region.

b) Hygiene education should be combined with environmental education, especially for problem zones.

c) Development of suitable cost effective technologies based on designs used elsewhere

3. RECOMMENDATION FOR KAZAKHSTAN; SUGGESTED UNICEF INTERVENTIONS FOR WATER SUPPLY, SANITATION AND ENVIRONMENT

3.1 IMPROVED TECHNICAL COMMUNICATION NETWORK

Objectives:

(i) Update technical methods used to improve cost effectiveness and accelerate service coverage.

(ii) Develop international linkages with major donors and private sector manufacturers to attract additional financial and technical support.

(iii) Develop manpower resources to improve quality of services constructed and their effective operation and maintenance.

Suggested Activities:

Sharing of relevant technical information and research literature; exchange visits with relevant projects especially PCV and HDP pipe manufacturers in India, Europe and South East Asia, small bore sewer systems in Pakistan etc.; arrangement of national workshops and seminars inviting suitable technical persons to demonstrate improved technologies; conducting of training courses in more cost effective technologies including low cost drilling methods, construction of improved piped water supply systems, installation of solar pumping system, where feasible.

Suggested Budget: US$ 100,000 (Additional funding to be generated from other donors)

3.2 CAPACITY BUILDING FOR IMPROVED SECTOR MANAGEMENT

Objectives:

(i) Development of improved planning methods to accelerate service coverage in achievement of the Global Goals.

(ii) Development of human resources for staff employed in water, sanitation and the environment.

(iii) Improvement of data management system to facilitate data collation, analysis and information exchange.

Activities

Assistance in development of National Plans of Action especially for rural water supply and sanitation; training of health and sector staff in improved sector planning and management; provision of suitable computer equipment for the Oblast level; provision of portable water quality testing kits for both bacteriological and chemical analysis; monitoring of agro-chemical levels especially in the Aral sea region.

Proposed budget: US$ 100,000

3.3 SUPPORT FOR PERI-URBAN AND RURAL SANITATION

Objectives:

(i) Raise awareness of the need to improve overall environmental health conditions.

(ii) Introduce low cost technical options to conventional sewer systems.

(iii) Generate increased financial resources to improve service coverage levels.

Activities:

Conduct research into present sanitary practices and traditions; develop suitable environmental health campaign using most popular media developed around salient key messages; introduce suitable cost-effective technical options on a small scale in problem regions; develop suitable project proposals for increased sector funding from both government and donors to accelerate service coverage; encourage private sector production of household latrines through training.

Budget: US$ 120,000 to include demonstration models, trainings, environmental education materials.

Table 1

APPENDIX I

Basic Data - Republic of Kazakhstan
(from 1989 unless otherwise noted)

Area	27 Mn. sq. km., 13 per cent arable
Population	17.1Mn (1991) with 12 per cent <5 21 per cent 5-15 9 per cent >60 59 per cent urbanization density: 6 persons sq/km.
Crude Birth Rate	23.0 per 1,000 population
Crude Death Rate	7.6 per 1,000 population
Infant Mortality Rate	24.7 per 1,000 live births (1991)
Life Expectancy at Birth	Male: 63.9 years Female: 73.1 years
Child Health	LBW (<2.5 kg.): 5-7 per cent Premature (,36 weeks): 17-19 per cent C-Sections: 3 per cent MMR: 80 per 100,000, up to 120 in some areas.
Breastfeeding	From birth - 90 per cent at 3 months - 70 per cent at 6 months - 40-50 per cent at 1 year - 20-30 per cent Exclusively at 1 month - 50 per cent at 3 months- <10 per cent
Immunization	6 antigen coverage for 0-1's claimed to be 90 per cent; review of MOH data suggests first dose may be 90 per cent, but probably 10-20 per cent lower for second and third dose.

Source: BUCEN, 1991; Goskomstat SSSR, Moscow, 1991; and the Ministry of Health, Kazakhstan.

APPENDIX II

NOTE FOR THE RECORD
OFFICIAL GOVERNMENT STATISTICS
FOR WATER SUPPLY COVERAGE

The following information was obtained on water supply coverage from The Sanitation and Epidemiology Section, Ministry of Health, Alma Ata on the 21 Octoboer 1992[1].

Total Water supply coverage	70%
Rural Water Supply	51%
Water from Open wells and Handpumps	23%
Water from Tankers	7%
Rivers and other Surface sources	10%

[1] Interview with Sevostyanova Svetlana Elevinov, Specialist, Sanitation and Epidemiology Section, ministry of Health.

APPENDIX III

NOTE FOR THE RECORD

SEMINAR FOR COST-EFFECTIVE TECHNOLOGIES FOR WATER SUPPLY AND SANITATION IN RURAL AREAS

A meeting was held with Mr Partniagin Anatolij, Deputy Chief, Water Supply Department, Ministry of Agriculture and Dujsenbinov Sajau Sajdahmetovieh, Deputy Chief of Irrigation and Water Supply to discuss promotion of more cost effective technologies for the rural areas. This meeting was held after agreement to this concept had been given by the Deputy Minister of Health, Mr Andrey Raymer, Chief State Sanitary Physician.

It is proposed that a two to three day workshop be held in a suitable location to share information different technologies used in other countries. In addition suitable private sector manufacturers of pipes and authorised pump dealers will be invited to attend.

It is suggested that the meeting be held in March/April 1992 at the convenience of the Government of Kazakhstan. The agenda will be developed by UNICEF and shared with both the Ministry of Health and Agriculture prior to finalization. UNICEF will pay for technical experts, workshop costs etc. The government will pay for attendance of Oblast and central level personnel. It is also suggested that suitable government personnel from the other CARK countries be invited to attend.

APPENDIX IV

TERMS OF REFERENCE FOR RAPID ASSESSMENT OF WATER SUPPLY, SANITATION AND ENVIRONMENT IN THE CARK COUNTRIES

1. OVERALL OBJECTIVE

To make a rapid assessment of the present situation in water supply, sanitation and environment, especially in peri-urban and rural areas, in order to make suitable recommendations for suitable interventions over a two year period (1993-94).

2. SPECIFIC OBJECTIVES

2.1 Estimate population still to be served by water supply and sanitation facilities and total cost for provision of services if present methods are continued.

2.2 Examine technologies used, their suitability, cost and ease of maintenance.

2.3 Investigate user needs in unserved and served areas and ability to pay for services for both initial construction, operation and maintenance costs.

2.4 Assess present capacity of government, non-government and private sector agencies to provide services and consider how this can be strengthened.

2.5 Examine present hygiene behavioural patterns, especially of women and children, and barriers to changing these.

2.6 Ascertain what are the major water related diseases, their prevalence, modes of transmission and present methods of control.

2.7 Assess functioning and utilisation of services.

2.8 Assess major environmental problems, capacity of government to respond and remedial measures to address these.

2.9 Review technical information available and present research being undertaken.

3. INFORMATION TO BE COLLECTED

3.1 Water Supply and Sanitation

3.1.1 Present coverage levels for urban/rural water supply and sanitation and levels for 1980 and 85. This should include figures of total population served and those still to be served.

3.1.2 National plans, if available,with regional breakdown of services still to be provided.

3.1.3 Annual budget available for capital and recurrent costs for both water supply and sanitation and a breakdown of how much is external assistance.

3.1.4 Details of services already provided with respect to technical options selected and design factors i.e. amount of water provided on a per capita basis and per capita costs of services provided.

3.1.5 Relevant hydrogeological information of groundwater resources and present methods of exploitation

3.1.6 Inspection of services provided to investigate actual functioning and effective utilisation in both rural and urban areas.

3.1.7 Present monitoring systems, how these are maintained and data base presently available.

3.1.8 Visit to villages with and without improved water supply and sanitation facilities.

3.1.9 Details of all government, non-government and private sector organisations involved in the provision of services and level of coordination.

3.1.10 Annual implementation rates for water supply and sanitation services and how these have been affected in the past two years.

3.1.11 Maintenance programme in rural and urban areas, annual costs and how much is contributed at the household level.

3.1.12 Water quality testing facilities for both chemical and bacteriological tests. Types of equipment available and how this is monitored at the field level.

3.1.13 Present research and training institutions available and their capacity.

3.2 Environment

3.2.1 Major environmental problems, especially with respect to the Aral sea region and present plans to address these.

3.2.2 Ground water pollution, major underlying causes and how this is being monitored. Indication of levels of chemical and bacteriological pollution in different regions.

3.2.3 Garbage disposal facilities and how these are managed.

3.2.4 Information shared with households concerning environmental factors, especially with respect to water logging and salinity problems.

3.2.5 Present legislation with respect to environmental factors or plans to introduce these.

3.3 Health Aspects

3.3.1 Major water related diseases, their incidence rates, methods of control and treatment e.g. diarrhoeal diseases, hepatitis A, typhoid, cholera, intestinal worm infections, fluorosis.

3.3.2 Major transmission routes for excreta-based diseases (through observation methods)

3.3.3 Hygiene behaviour especially of mothers and children and reasons why thee are practiced including existing beliefs.

3.3.4 Nitrate pollution and its effect on infant mortality rates (methoemoglobinaemia).

4. METHODS TO COLLECT INFORMATION

4.1 Interviews with government/other organisations responsible for the following

a) Urban/peri-urban water supplies

b) Rural water supplies

c) Urban/peri-urban sanitation (excreta disposal)

d) Rural sanitation

e) Communicable diseases

f) Water quality control

g) Environmental pollution (monitoring)

h) Environmental education

i) Training of engineers/overseers for WATSAN

4.2 Visits to the following

a) Peri-urban water supply and sanitation systems

b) Rural villages with water supply and sanitation systems

c) Villages with no existing services for both

d) Villages with environmental problems e.g. excessive salinity

APPENDIX V

KAZAKHSTAN

No.	NAME AND DATE OF MEETING	POSITION	ADDRESS AND TELEPHONE NUMBER
1.	V.N. DEVIATKO 20.10.92	MINISTER OF HEALTH	ABLAYCHAN AVENUE, 63, ALMA ATA, 480003 TEL. 33-46-11 FAX: 33-17-19
2.	SHEJANOV VITALY NICHOLAEVICH 20.10.92	CHIEF, SANITATION AND EPIDEMIOLOGY DEPT. MOH	ABLAYCHAN AVENUE, 63, ALMA ATA, 480003 TEL. 33-44-69
3.	SEVOSTYANOVA SVETLANA ELEVINOV 20.10.92	SPECIALIST, SANITATION AND HYGIENE, MOH	ABLLAYCHAN AVENUE, 63, ALMA ATA, 480003 TEL (O)33-02-14 (H) 34-74-49
4.	FYODOR E. TCHOURKIN 21.10.92	CHIEF ENGINEER WATER SUPPLY CORPORATION	480057, ALMA ATA ZHAROKOV STR, 196 TEL: 44-84-02 FAX: 44-84-02
5.	IVANOVA RUPTINA SERGEEVNA	DEPUTY CHIEF, MAIN SANITATION AND EPIDEMIOLOGY STATION FOR KAZAKHSTAN	
6.	POJELAEV VALENTIN 21.10.92	CHIEF, MAIN SANITATION AND EPIDEMIOLOGY STATION FOR KAZAKHSTAN	
7.	MALII LILIANA ALEXANDROVNA	SPECIALIST RURAL WATER SUPPLY, MINISTRY OF AGRICULTURE	480065, ALMA ATA, SQUARE OF REPUBLIC, 15

KAZAKHSTAN (Cont.)

NO.	NAME AND DATE OF MEETING	POSITION	ADDRESS AND TEL. NUMBER
8.	YAKUNINA ASIA PANTELEEVNA 22.10.92	DEPUTY CHIEF, DEPT. OF WATER RESOURCES.	TEL. 63-77-14
9.	ANDREY A. REYMER 23.10.92	DEPUTY MINISTER OF PUBLIC HEALTH	63, KOMMUNISTICHESKY PROSPEKT, ALMA ATA 480091 TEL: 33-02-09
10.	JIDEBAEV KASEN JIDEBAEVICH 26.10.92	DEPUTY CHAIRMAN, FRUIT AND VEGETABLE ASSOC., MIN. OF AGRICULTURE	480065, ALMA ATA SQUARE OF REPUBLIC, 15 TEL: 63-45-32 FAX: 83272 63 13-77
11.	DUJSENBINOV SAJLAU SEJDAH-METOVLEN 21. 10.92	DEPUTY CHIEF, IRRIGATION AND WATER SUPPLY, MIN. OF AGRICULTURE	480013, ALMA ATA, SQUARE OF REPUBLIC, 15 TEL: 631788
12.	PARTNIAGIN ANATOLIJ 26.10.92	DEPUTY, WATER DEPARTMENT, MINISTRY OF HEALTH	480013, ALMA ATA, SQUARE OF REPUBLIC, 15 TEL: 63 17 77