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SECTOR AND UTILITY MANAGEMENT OF WATER SUPPLY IN THE NETHERLANDS

**A report on the two-week Exposure Programme for
Senior Indian Officials April 11 - 28, 1994**

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Netherlands Water Industry at a glance

Netherlands has a population of approximately 15 million with a density of 446 persons per square kilometer. Before starting the water supply schemes, people used to consume water from canals and rivers. Water from elsewhere was brought by boats. Due to contaminated water typhoid, cholera and other water borne diseases were quite common. The hard work, advanced technical knowledge developed through continuous research and development work and the commitment, the Dutch were able to develop very high living standards. The first water supply scheme was established in the city of Amsterdam in 1853. In 1930s percapita consumption rate was 60 liters and after the 1930s, this has increased to 130 litres. Until 1952, the water companies were owned by municipalities. The provincial law which was declared in 1897 reorganised the water companies. In 1938 there were more than 200 water companies in the Netherlands. Timely legislations and its effective implementation on water sources, treatment methods and water quality standards helped the governments through the water companies to organise the sector in a sustainable manner. The reactions of the community and environmental groups have been always sought for before decisions on implementation of schemes and changing sources or quality standards were taken.

The Public water supply act 1957 is the legal basis for the activities of water supply companies. In the Netherlands four laws are of particular relevance to the water supply sector. These include the drinking water supply act, the ground water act (1981), the soil protection act (1986) and the water management act (1989). Main sources of drinking water supply are ground water (2/3) and surface water (1/3). One of the major challenges in the country was the treatment of polluted river water from Rhine and Meuse. Very high level of consciousness and commitment is involved in providing good quality drinking water. The water supply company serving the city of Leeuwarden was first in establishing, in 1892, a laboratory for bacteriological water examinations. The first full-fledged water supply laboratory was established in Rotterdam in 1892. Besides giving attention on raw and treated water a great deal of attention was also given into the quality aspects of transmission mains for the conveyance of drinking water including health related aspects. Now every company has a well established laboratory facilities to check the quality of water. Besides, the public health department also engaged in checking the quality of drinking water.

By law, water companies in the Netherlands require to recover the total cost from tariff revenues. The companies do not have any profit making objectives. The total costs are composed of depreciation (25%), interest (25%), personnel (30%) and other operational costs (20%). A domestic consumer is charged approximately US\$ 60 per year for water. Total expenditure for water supply consumption constitutes approximately 1% of the household income. 100% of the population are served with piped drinking water supply. Eighty per cent of the 6.2 million connections are metered and the remaining connections are charged according to a flat rate system. The cost of water (for 1000 liters) for household consumption is approximately Dfl.2 and this rate varies from Dfl.1.75 to Dfl.2. company to company. Same rate is applied to industrial and agricultural connections. The average daily consumption pattern is as follows:

Usage pattern	Litres per day	%
Personal hygiene (mainly bathing)	49	38
Flushing toilet	36	28
Washing clothes	20	15
Dish washing and others	17	13
Cooking and drinking	4	3
watering the garden, washing car etc	4	3

Total	130	100

The unaccounted water is approximately 6% on an average; this low figure is due to an efficient billing and collection system introduced by the water companies supported by adequate maintenance of distribution systems. The latter system comprises of a total length of 90,000 kms made up of asbestos cement (41%), cast iron (17%), steel (3%), PVC (37%) and other materials (2%).

The water companies altogether invests approximately US\$ 350 million per annum for augmentation and extension of water supply production and distribution works. The total staff employed by the companies to approximately 8,500 who earn, on an average, US\$.32,000 per annum. There are 37 water companies now which will be reduced to 25 by the end of this century.

It is worthwhile to mention here that in the Netherlands, there is interaction at all levels of the Consumers, Water works association and Public relations sections for organising and transforming the drinking water sector in the right perspective.

REPORT ON THE TWO WEEK EXPOSURE PROGRAMME FOR SENIOR INDIAN OFFICIALS IN NETHERLANDS FROM APRIL 11 - 28, 1994.

1. Introduction

In the 19th and 20th centuries, progressive attitude towards water and sanitation played a major role in reducing morbidity and mortality due to infectious diseases in the society. It has generally been observed that improvements in water supply and sanitation have a similar role to play in reducing the high level of morbidity and mortality that prevails in many developing countries today. Potable water alone does not bring sanitation or health. Neither do latrines nor do both if people do not practice satisfactory personal hygiene and environmental sanitation habits.

During the past decade, global policies and strategies have been developed for improving the implementation, management and monitoring of water supply and sanitation programmes. Many countries, including India adopted the goals of the International Water Supply and Sanitation Decade and were committed to providing clean water and sanitation to all by the year 1990. The International Water Supply and Sanitation Decade programme was launched by the Government of India in 1981 with a view to providing the population with safe drinking water and basic sanitation facilities over a period of 10 years.

Though the water decade was observed by many different nations, the output of the activities were not encouraging due to the multiplicity and complexity of problems. India is a country with different habitation patterns, diverse culture and taboo systems which made implementation of tailor made programmes difficult. Moreover the legal framework, strategic plans and appropriate resources were not made available to achieve the target of the decadal plans.

The Indo-Dutch co-operation in the water supply and sanitation sector began in the 1980's in order to supplement the efforts of the government to provide adequate water supply and sanitation in approximately 6000 villages in 43 districts of 5 States in India. The programme started in the state of Kerala during 1982-1983. More than the budgetary support, the Indo-Dutch co-operation aims at developing creative interaction in the development policy legal framework and developing innovative approaches in decision making in the water and sanitation sector.

The Netherlands Government (Ministry of Foreign Affairs, Director General for International Co-operation) together with the International Institute for Hydraulic Engineering and the AQUANET (Consultants for Water Enterprise Development) organised an exposure programme for Senior Indian Officials on **Sector and Utility Management of Water Supply in the Netherlands** from April 11 - 28, 1994. The objective of the training programme was:

- (i) to expose senior officials from government and NGOs to the Netherlands water sector, with a view to provide an opportunity to analyse it's development, institutional and legal arrangements, and technical operations in it's socio-political and historical context;
- (ii) to provide a forum for the discussion of issues confronting the Indian water sector with colleagues from the Netherlands;

- (iii) to reflect the necessity and assist in the identification of changes that may be required in the Indian "enabling environment" so as to enhance the quality of the rural water and sanitation programmes;
- (iv) and to explore possible cooperation between Indian and Dutch water sectors. Special attention and focus was given on the institutional and legal environments, historical perspective and development of the sector, processes and factors involved in policy and decision making, and utility management and operations.

The list of participants and the programme schedule is listed in the appendices (1 and 2).

It is worthwhile to mention here that this paper is presented on the basis of the broad topics listed in the course content for the training. The Indian drinking water and sanitation sector, with the limited information available is compared with that in the Netherlands as an effort to throw light on some basic differences between the two countries.

2. Historic Development of Drinking Water in the Netherlands & in India.

The Netherlands has a very long history on its water sector. Some rudimentary forms of water supply existed in the early days where one example concerns the phenomenon of the so-called 'Water Boards' in the middle of 18th century. For many centuries, the inhabitants in the Netherlands directly took water from rivers, ponds and wells or from rain water. It took more than 100 years after the introduction of public water supply in the Netherlands, before the Public water supply act was introduced. In 1853 the first drinking water supply system was developed for the city of Amsterdam. The people there used to drink surface water brought by boat from other places like the people in the Kuttanad areas in Kerala did. Due to contaminated water from surface sources, typhoid, cholera and other water-borne diseases were quite common. In 1866, the Netherlands Public Health Inspectors, in their report to the King, emphasised their reference for the development of collective water supply systems and the supervision by the government on water quality. The Water supply company serving the city of Leeuwarden was first in establishing, in 1892, a laboratory for bacteriological water examinations. The first full-fledged water supply laboratory was established in Rotterdam in 1892. Besides giving attention on raw and treated water a great deal of attention was also given into the quality aspects of transmission mains for the conveyance of drinking water including health-related aspects. A turning point in this was the establishment of Netherlands Association of Water Supply Interests (VWN). Later on this responsibility was taken over by KIWA, the Water works testing and Certification institution established in 1946. Through good planning, timely and effective legislation and hard work, the Governments in Netherlands were able to develop a comprehensive water management policy and implementation plan for their country. The development and growth of water companies is one of the important aspects of the water industry in the Netherlands.

In the Netherlands the sector had the initiative from private parties and then it was taken over by the Municipalities/Municipalities and provinces jointly and now the sector is with private limited companies owned by the Municipalities and or Municipalities and provinces. It took more than 100 years to come to this stage. It is totally different from the privatisation that

has taken place in the United Kingdom.

In India the historic development was a very slow process towards an efficient water management system. Private initiative was there in certain areas however the people were finding out their own sources and neither the national government nor the state Governments took any serious initiative after independence at the initial period. Under the British colonial system, many Urban water supply systems were constructed by them and timely augmentation of the systems were not done during post-independence period due to financial constraints and lack of initiative at the Government levels. Bilateral and multinational aids and World Bank have slowly stepped in to help the sector in this country and the water decade has made us to apply our mind seriously to this sector. State Governments have still to organize the sector to strive ahead to achieve the goals. Water authorities/Boards have been constituted in certain states and still a proper organizational and strengthening the institutions have to be done to make the systems more sustainable and efficient. Proper planning has to be done to have an urgent short term approach and long term approach. The traditional systems cannot be ignored until we have a proper piped water supply network or independent efficient spot sources. To cover the entire state/country by piped water supply schemes may be only a dream in the near future because of the vastness of the country and the spread of the population.

3. Development Policy, sector models and the role of Governments

In the Netherlands the Public Water Supply Act (1957) provides a legal status and basis to take new initiatives by the public water supply companies. In the 1940s there were 240 water companies and now only 37 water companies are operating in the country. As explained earlier there was a need for regulations on hygienic supervision which was carried out through the public health officers on a voluntary basis. The major thrust of the Act was to improve sources both in quantity and quality and rules on hygienic supervision and reorganisation of existing systems. In 1986 the objective of the Act was completed with laid guidelines on preparation and realisation of water supply works. Drinking water supply had to be safeguarded in the struggle with other interests. Especially by the reservation of ground and surface water sources.

A three tier structure: National level, Provincial level and Municipal level functions to keep the system working (see appendix 3). At the national level, three Ministries are involved in this affair, viz, Ministry of Housing, Physical Planning and the Environment, Ministry of Public Works and Water Management and Ministry of Agriculture to design policy, strategy and integrated approaches. The Provincial and Municipal levels are mainly involved with the implementation of projects through water companies. The Minister of Housing, Physical Planning and the Environment is responsible to the Dutch Parliament for the water supply. There are specific legislations on environmental protection and water management such as the Physical Planning Act of 1962, Act on Soil protection and Act on environmental protection (1992), Ground water abstraction act (1981) and water management act (1989), Act against surface water pollution (1969) and so on. The Governments at the

provinces are elected by the inhabitants and the day to day administration are entrusted to the delegates under a commissioner nominated by the Crown. The municipal governments are elected by the people and operated by aldermen, elected from among the councillors and presided by a Mayor who is appointed by the Crown. The main responsibility of the Water Boards is to protect the land against flooding, in distribution of surface water and in maintenance or improvement of its quality and sewerage. The water companies are mainly responsible for the operation and maintenance of drinking water systems and most of the companies are public limited companies. The Public Water Supply Act puts the water supply companies under the obligation to survey their house connections and plumbing, in order to avoid pollution of their networks. General rules on this survey are laid down in all drinking water delivery contracts, for which a model has been prepared by the Organization of water supply companies, viz, VEWIN in co-operation with the consumers' organisations. These rules incorporate a National Standard on Plumbing (NEN 1006). The certification system is prepared and will be executed on agreement between VEWIN and Plumber's Corporations. The relation between the public water supply services and the consumers is ruled by civil law. Complaints about the product (eg. the water quality) can lead to indemnisation. Due to agreement between the well organised network of the Netherlands Association of Drinking Water Supply Services (VEWIN) and the Consumers's organisations, most conflicts are solved by arbitration boards that give their verdicts as a binding advice. The threshold to these arbitration boards is a fee of Dfl.45.(equivalent to Rs.720/=) which has to be paid in the beginning. This amount will be refunded when in the case the consumer is proved right. Within the framework of the national government's long term planning the Water Works Association (VEWIN) is by law required to prepare progressive mid term plans, covering a period of 10 years; for each water company this mid term plan includes a forecast of the total water consumption and the water supply infrastructure required to meet the demand. The Plan requires the approval of the Ministry of Housing, Physical Planning and the Environment.

It is worthwhile for the Indian government to review and study the various legal policies and remedies developed by the national and provincial governments of Netherlands at appropriate occasions. The organisational set up which exists in the Netherlands is different than the set up that can be seen in India where respective departments/ boards/ authorities function in various States.

One of the major distinctions that can be made about the Netherlands and India is that a single organization responsible for water supply and sanitation sector does not exist in India. There are two parallel ministries responsible for the implementation of water supply programmes viz. rural water supply and urban water supply programmes. In the sanitation sector different departments and NGO's are involved in different types of programme implementation. Unfortunately the water sector in India is not well organized and the legislation and policy aspects are inconsistent and the needs of each State has not been looked into seriously. There exists a big gap between the urban and rural sector. According to the Census of India (1981) the percentage of households with access to safe drinking water in rural India was 26 as against 75 in the urban areas. The goal of every drinking water supply

programme unquestionably is to reduce mortality and morbidity from water borne diseases. The Government is unable to provide facilities according to the demands of the community mainly due to inadequate budgetary provisions and priority given by the government and the lack of initiatives in developing community relations. In spite of all this, water decade and the co-operation from the bilateral and multilateral agencies facilitates the Government of India and the State Governments to initiate new activities for providing better services to the community.

As indicated above the general policy pursued by the Netherlands made a shift in its policy for assisting projects which are technically sustainable with adequate O&M support of user community. They are highly conscious about the quality of water and laboratory facilities have been developed in all water companies. They are also looking into the financial sustainability which naturally leads to effective cost recovery. Institutional sustainability is also one of the aspects pursued. The water companies are able to manage and maintain the facilities in a systematic manner and there is close linkage between the technical and financial sustainability. Public relations play an important task of communicating with the consumers, school children and members of water users associations. In the Public Water Supply Act there are two planning configurations specifically for drinking water supply: the national government's Drinking Water and Industrial Water Supply Policy Plan (BDIV) and industry's medium term plan (ten year plan). In the Water Management Act it is stipulated that the national government will formulate a Management Policy Plan, in which it explains the policy principles for the qualitative and quantitative management of surface and ground water. However, in India even after independence, concerted efforts for improving the drinking water situation in rural areas has yet to acquire the deserved importance. It was only in 1954, that the rural water supply and sanitation programme was introduced in the first five year plan, as part of the health sector. The first five year plan had a provision of Rs.60 million for rural water supply and sanitation facilities. However, the provision went on to be increased in the current eighth five year plan, the provision for the total water supply and sanitation sector is in the order of Rs.16,4860 million (combined State and Central provision). The Health Minister's conference held in 1957, gave the highest priority to the provision of safe drinking water supply followed by environmental sanitation. In 1961, the Health Ministry appointed the National Water Supply and Sanitation Committee. This Committee recommended that a sum of Rs. 900 crores be allotted for the completion of water supply and sanitation programmes. Unfortunately, in the five year plans, the allotted funds turns out to be much less than those required to meet the target. In 1964 an All India seminar on water supply and sewerage works, suggested the formation of autonomous water and sewerage board to deal efficiently with the problems. The National Conference for drinking water facility held at Sevagram, Wardha also developed an action plan to implement new water supply and sanitation facilities. The reality was that the number of villages with drinking water problems had not decreased. As industry and Agricultural sectors were given top priorities in the initial period the sector development policy was getting further importance and at national level CPHEEO (Central Public Health and Environmental Engineering Organisation) was formed and general policies and guidelines were issued. Human resource development and training was one of the key activities taken up by the

CPHEEO and several training programmes were initiated in India for the engineers working in the sector. Due to rapid population growth, high density of population, modernisation and abandoning of traditional water sources the community is demanding for improved water supply systems and sanitation facilities. Budgetary allocation was further increased and the states were given more and more importance for the sector. The national policy to cover the entire population with a spot source at least within a radius of 250 m was taken up and the technology mission was formed in the Rural Ministry in the 1980's with the objective of providing a new impetus to the development in rural areas. Now in the eighth five year plan the policy declaration is to protect the environment and health through the integrated management of water resources and liquid and solid wastes. The policy document also clearly illustrates the need for organizational reforms and participation of people, especially, women at all levels. The document also stressed the need for developing community managed water and sanitation facilities with strong local institutions in implementing and sustaining water and sanitation programmes. Better management of the assets and sound financial practices and the use of appropriate technology are to be the keywords. Top priority is given to villages with no sources and poor/and or the weaker sections.

Sector models vary from nation to nation and also there is a long history of the development models in different parts. In the Netherlands, private initiative which was there as early as in the 19th century when water was collected and distributed at a price of one cent per bucket. Gradually this responsibility was taken over by the municipalities and several private companies. In the early 20th century the number of companies were as many as 240 and this model has slowly been getting reduced to lesser numbers. Most of the companies function with share holders from the municipalities/inhabitants. Very few companies are owned by the Municipalities. However no profit is given out as dividends. In England, the sector was completely privatised at the time of Prime Minister Margaret Thatcher and the Water Authorities are owned by private share holders. In India the sector model is quite divergent and in a fluid state. There is no local institutional strength to manage even basic O&M principles. The water schemes are implemented by the departments under the Panchayati Raj or the Water Boards or Authorities. There should be sound and strong financial institutions to carry out this job. It may still be difficult to suggest a suitable model for the sector. The Kerala Water Authority is an autonomous body responsible for all the water supply schemes and sewerage works in the State of Kerala with the full mandate for O&M is a typical model. With the introduction of Panchayati Raj and Nagarpalika Bills, the responsibility for O&M may be handed over to the local bodies at a future date. But nothing can be spelt out at this point of time. It is not a question of who is doing it but whether the responsibilities can be carried out by the organisation chosen for the job is very important. Water supply maintenance and cost recovery are to be effectively carried out under the declared policy of the Government for which participation of the consumers is a vital need and particularly, involvement of women in the sector is recommended.

4. Organisation and legislation - lessons and their applications

The organisations in the Water Supply sector in the Netherlands are all Public Limited

companies and the sewerage systems and water management is the responsibility of the Water Boards. As explained above the municipalities / inhabitants are the share holders of the water companies. Elected members from the local bodies are at the top of the organisation structure and there are Board of Directors or Commissioners working in a supervisory capacity. One or more Managing Directors appointed and working under the Board of Directors are responsible for the entire working of the Company. In the Netherlands it took more than hundred years to introduce the Public Water Supply Act (1957). Prior to that Public Health Officers were doing the job on a voluntary basis but the need came for regulations on hygienic supervision. As we can very well understand drinking water supplies established in early days were not adequate to cope up with the demand. As late as in 1986 the Act was completed with rules and regulations for effective management of the sector. There is a struggle with other interests especially to get reservation of both surface and underground water. At present, 2/3 of the entire demand is met from underground sources and the green lobby is working to switch over to surface sources which may lead to heavy capital and O&M costs. Deterioration of water quality is of grave concern in river Rhine and river Meuse and the Provincial government has to introduce a series of legislative measures to safeguard these water sources. To supplement the efforts, laboratory facilities have been set up in all water companies and also at the health department to check and monitor the quality of raw water and treated water. The international committee for the protection of Rhine established in 1950 was an initial step in this regard but it took 27 years before the first international arrangement to reduce chemical pollution was agreed upon. In 1970, the international committee of water works, located in Rhine river basin was established. The purpose of these committees was to pressurise governments for the improvement and upkeep of the river water quality. Simultaneously, the surface water sanitation Act came into force which included a taxation system for waste water discharge. The enforcement of this Act has contributed a drastic reduction in industrial water consumption on one hand and an improvement of the quality of river water.

In India, except in the state of Kerala, Gujarat and Uttar Pradesh, the sector is organised in different departments or Departments and boards. The responsibilities of the maintenance of the systems are given to local bodies who find it difficult to handle due to poor technical and financial support. Lack of involvement of the consumers in the maintenance also lead to the deterioration of the facilities and often the system fails to deliver the goods. The non-availability of funds and weak organisational structure etc., prevents the sector from attaining the desired objectives. With the Kerala Water and Sewerage Act, 1986 and with the amendment Act (1992), the Kerala Water Authority is functioning to get over its initial problems. By an Ordinance in 1984, the erstwhile Public Health Engineering Department was formed as an Authority. It took nearly two years to pass the Act. Procedural delays in the Government is one of the reasons for the delay in implementation of the schemes. The KWA Act is not powerful enough and there is no full autonomy because the KWA is even now depending on the government for its functioning. Unless powers for decision making given to the Authority it can not work effectively. But this can be attained only if KWA becomes financially sound. Funds have been given to the State governments for rural water supply and sanitation programmes based on a prepared formula but no effective monitoring

mechanism is developed at the Government of India level in this sector. Adequate legislation should be passed by the central government to organise the sector in a feasible model/models taking into consideration the situation in each state. Appropriate legislative arrangements will have to be developed by the state governments for source protection and conservation. However, cost recovery aspect has to be clearly addressed by the Government of India more loudly. O&M part is one issue that should at least be met by the consumers. As far as Kerala is concerned local bodies are the biggest consumers who are often reluctant to pay for water. There should be adequate financial help or guidance for cost recovery. In many situations lack of adequate fund flow in to the sector leads to time and cost over runs. The projects are ambitious and people at large are still not covered at a satisfactory level.

5. National Water Sector Planning and State Water Sector Planning

In the Netherlands, during the formulation of its Third Ten-year Plan (in 1989) and the Drinking and Industrial Water Supply Policy Plan (BDIV since 1990), planning envisaged in the Public Water Supply Act was no longer entirely in line with the current insights regarding division of tasks and authority and in future they regard to have amendments in the law. VEWIN (the Association of Netherlands Water Works) indicates how the need for drinking and industrial water is expected to develop and how this need can be met, through the establishment or change of Water Supply Plans. Water Management Act and the Environmental Management Act are also helping to evolve plans at the provincial level.

In India, water sector planning is taken up by two ministries. Technology Mission under Ministry of Rural Development tried to advocate many initiatives particularly the construction of bore wells with hand pumps to quickly cover the rural community which is approximately 80% of the population in India. the implementation is taken up by different agencies. A new National policy has to be evolved to the Sector Planning both in rural and urban areas. A recent survey conducted by the Technology Mission to find out the actual coverage is yet to be completed.

The Government of India has evolved a National Water Policy in the year 1986 in which Water supply is given top most priority. In Kerala, the State Government has also evolved a State Water Policy in line with the National Water Policy. In India, since the Water Supply Schemes are separated under different ministries to evolve a National policy on water supply in general may look so odd. Co-ordination which is needed at the national level loses its perspective. Since India is a very vast country and tackling the problem at a national level may not solve the issues even at a distant date. What the Government of India can do is to bring the sector under one ministry and evolve a National policy and prepare guidelines so that each state should evolve its own sector plan at the state level. The problem is so immense and a disorganised sector can not get the degree of results if dealt with by different people. A pragmatic and workable strategy has to be evolved for rescuing the water sector in the whole country. With the assistance of bilateral donors like Netherlands it will be possible for the Government of India and the respective State governments to take up new initiatives for solving some of the problems indicated above.

National Government should develop policies based on increased coverage, quality control and cost recovery aspects and to find out how far they can help the state Governments in the urban and rural communities. State Government should definitely take up the sector as the national Government of the Netherlands has started to solve the problems. However in the Netherlands the water supply and sewage schemes are completely dealt by different agencies and there is a view that this is not a good arrangement. The state Governments in India have different moods and approaches in this sector and the large capital investment made are not properly maintained due to lack of institutional support and divided responsibilities. Consumer satisfaction is still a dream for many. The Government of India can chalk out policies and guide the state Governments in this regard.

6. Technological Development

Technological development in water sector is known to the concerned people in authority and proper training and exposure programmes in the developed countries have kept the door open. Choosing of appropriate technology and its cost effectiveness is a matter of choice. Unless proper institutions are not established, as those exist in the Netherlands and other developed countries, the technology cannot be adequately understood to make a headway towards perfection. Appropriate and systematic research & development component has to be developed for identifying the most suitable technology option. Environmental issues are to be given serious considerations and the people's opinion and suggestions should be taken into account while choosing a particular technology as is the case in the Netherlands. People with lot of experience and knowledge is required in the sector for which first of all proper institutions have to be strengthened and the technical personnel should be given adequate training. This is a separate issue by itself which requires more deliberations and consensus. In fact this issue which has more relevance in a densely populated state like Kerala, this could be taken up for discussion on another occasion.

7. On Governmental organisations, Municipalities and General public - the case in India and Netherlands.

Municipalities, like every other organisation are very active in the Netherlands. With the co-operation and interaction with non governmental organisations and general public the service is maintained in a very satisfactory manner. In India, general public is still to be organized and made aware of their rights and non governmental organisations can play a crucial role. Professionals with adequate knowledge on the subject have to be made available by the NGOs. Health education to the general public on various aspects related to proper use of water, O&M and cost recovery should be given special focus. Initiatives on this could be taken up by the Government in this regard. Health education and the exposure of the school children on the sector may be very useful. Socio-Economic Units working in the Kerala state under the Bilateral assistance is currently engaged in carrying out most of these activities through ward-level water committees in forty five panchayats. This can be used as an example for developing a sustainable community-oriented programmes. Consumer protection Act, 1986 and the establishment of Consumer councils can facilitate the required awareness.

Consumer Protection Councils have sprung up in the state and by interaction with them the authorities can improve substantially. Intensive consumer education programmes can also serve as part of the awareness campaign.

8. Control and Monitoring

Controls and Monitoring are the key words for any organisation. These are necessary for the improvement of the systems and their proper maintenance. Control and monitoring should be internal as well as external. There should be a state agency and a national agency to have effective control over the institutions and their products. Control on the quality of products has to be taken up as the responsibility of the national government. As the materials and chemicals used are manufactured in the different parts of the country, a national agency should monitor and control the quality of materials. Maintaining the good quality of water should be the responsibility of the institution as well as the external agency entrusted by the state government. National Government should give general guidelines and give training to various personnel in the sector to provide better exposure to the developments taking place elsewhere. National institutes should be set up at different parts of the country to exchange and impart knowledge to the institutes to be set up in the states.

9. Research in Netherlands and India

Research and Development is an integral part of overall water management. These works are done by the water companies and at the national level KIWA is doing the same. All the companies are contributing to the KIWA on a prorata basis. The water companies are spending about 2 to 3% of their budget for research work. In India very little work is done in the research.

However within the institutions programmes of research and training have to be developed and therefore units have to be set up in these areas and proper exposure is to be given to the persons working in the units. Research has to be linked up with the needs of the institutions and training needs have to be assessed. Training has to be imparted to every one and it should be a continuous programme. Persons should be given training on rotation at least once in five years. Appropriate technology has to be familiarized through research work and training. Thus the quality of service can be improved. In the Kerala Water Authority the training programme was started on a large scale since 1991.

10. Lessons from exposure training.

A very good exposure to a situation which has a century old history was very informative and thought provoking. Even though the principles or the technology cannot be straight away applied to all parts of India, the legislation back up and the institutional set ups are very useful. The efficiency and effectiveness of the companies are to be emulated. Perhaps we may not be able to do it in a five year or ten year period. A serious orientation is to be made. Sector policies are to be spelt out clearly and the national and state governments have

to do a lot on this. Strong, efficient and committed institutions have to be developed. Governments should have clear cut objectives and problems have to be solved. Financial constraints may be there in the multiplicity of the problems and vastness of our country. However money has to be ultimately found out from the societies itself. Unlike other sectors this sector is so vital and benefitted by all. Though air has not become a serious problem, water has become a serious issue. One of the main failures may be improper and inadequate land use patterns. Unless the Governments are very serious in this aspect the development of the system scientifically will be big question. Secondly water use and management has to be taken up as one of the major items in the national agenda. Even though they are many institutions most of the time the institution may not be working effectively to solve the problem. National and state level discussions and interaction with the world communities are necessary to change the situation at home. Lot of research and development has yet to be done to march forward. At least in another 20 years time reasonable achievements can be made. The pace can only be increased if the institutions are made sustainable by proper legislation and commitment from our political rulers as well as people working in the sector. It was a unique experience to learn and interact with a wide range of specialists such as engineers, biologists, managers, economists, sociologists, cost accountants and politicians working together to serve the community with only service as their main objective. Even though they are public limited companies, their interest in profit making is only next to consumer satisfaction unlike in India. The general public in the Netherlands are highly conscious about quality of products. The Public Relations sections in each water company plays a predominantly crucial role in bringing together all the actors involved in the water sector like consumers, producers, distributors, municipalities, governments and consumer organisations all on the same platform. Every step in the decision making process is made with consultations and discussions with community groups, engineers, administrators and politicians. Even augmentation of schemes, increase of tariff or reduction in consumption of water etc. each plan is implemented in close co-ordination with all parties involved.

11. CONCLUSION:

The exposure programme was quite useful and some of the lessons learnt can be shared with other colleagues for improved project implementation. From the point of view of the situation in Kerala the team from Kerala was in general agreement with all issues brought out through questionnaires and interactions. The team consisting of a senior administrator, a senior public health engineer and a senior social scientist could interact with the entire delegation from within and outside very critically. With the background knowledge at home and the new information received at the excellent training programme the problems faced by the KWA could be analysed.

The KWA is a unique institution in Kerala. In fact there is no such institution in the whole country if we take stock of the sectoral arrangements in the different states. KWA is solely responsible at the moment for investigation, planning, design and implementation and maintenance of all the water supply schemes (big and small urban and rural) and sewerage

schemes. With all its limited financial capabilities and the minimal budgetary allocations strive hard to reach people with adequate water supply arrangements. Though much effort is made with the help of bilateral agencies, World bank loans and other financial institutions like LIC and HUDCO lot of works are yet to be carried out. At present more than 1700 water supply systems are operational and more than 400 schemes are at the various stages of implementation. The KWA is trying to solve its own financial problems with increased cost recovery, effective O&M, institutional restructuring and reorganisation. Peoples participation is also being tried to start cost recovery for standposts. Efforts are being made to arrange a series of workshops to communicate with the the local bodies for generating more income from water charges through mutual consultations and providing better services to the community.

The thrust areas identified were quality monitoring, cost recovery, O&M, testing and cerification and training and education. In the near future, KWA has to pay more attention to improve the quality of water. More laboratories have to be established and quality assurance and public awareness programmes have to be started. While properly conducting the quality monitoring, the expenses incurred on operation & maintenance of water supply systems can be controlled to increase efficiency and financial discipline. Co-operation of all the managers down below to the section level has to be channelised and a new policy has to be evolved. All the Officers and Staff involved in the execution and O&M are to be reoriented towards consumer satisfaction.

Another important thrust area is testing and certification. The national government has to take the lead in developing a centralised institution for quality testing and certification. The general scenario in India is not very satisfactory in this respect. Like KIWA in the Netherlands, an effective agency has to be set up at the national level as well as the regional levels to see that the materials produced for the water supply and sewerage schemes in the country are of good quality. This is mainly because the Bureau of Indian Standards certifications are not specific in their requirements in determining acceptable standards of pipes produced. With the present system of tendering procedures and ineffective quality control procedures, a large amount of money is wasted all over the country. The Water sector is very vital at present. It is time to shift focus on quality control while there should be some mechanism which ensures availability of quality materials as well.

Training and Education is essential to improve the efficiency and management capability for providing better services to the community. KWA has started a separate Training division with various training programmes to staff at various levels.

One of the serious problems faced by the water supply schemes in Kerala is lack of reliable source of water. Availability of water throughout the year is very uncommon and in fact this has been the most severe of all problems. Efforts have to be made for improved source protection and conservation. River-basin management studies have to be regularly conducted for ensuring required amount of water for drinking purposes.

12. RECOMMENDATIONS

The current situation in the water and sanitation requires a much more practicable working strategy for providing better services to the community. Following are the recommendations in the light of the exposure training held at the Netherlands.

1. KWA should be given more autonomy and decision-making power, similar to the water companies in the Netherlands freedom for the effective implementation of water supply schemes. Special emphasis should be given to the completion of bi-lateral and multi-lateral aided projects.
2. The tendering procedures and quality control measures (construction and laying of pipes) should be more realistic and the time lag (in implementing water supply schemes) due to bureaucratic interventions should be kept at the minimum. The high-powered committee which has been established by the Government of Kerala recently will take the lead in avoiding such delays.
3. There is a need for developing a testing and certification unit at the national level and the regional level which will ensure effective and systematic testing and certification of materials developed for water supply and sewerage schemes. This is one of the most important measures to be taken up immediately. Probably the Netherlands Government through KWA, will be able to support this activity as a follow-up measure of the exposure programme.
4. KWA has already taken the decision to develop a district laboratory in Trichur with bilateral support. However small scale facilities have to be set up in each comprehensive water supply schemes for ensuring good quality of drinking water. An external agency such as the Public health laboratory, or Pollution Control Board, besides KWA has to be identified for regularly monitoring water quality.
5. Re-organisation of the present structure for allowing experimentations on cost recovery and setting up of a Consumer relations cell for improved consumer satisfaction. This is in line with the structure of water companies in the Netherlands.
6. For ensuring perennial water supply, river basin management studies have to be regularly conducted. Efforts are to be made for improved source protection and conservation. The assistance of the Netherlands government and water companies could be made use of by conducting river basin management studies.
7. Training and Orientation should be designed for improvement of technical, managerial and public relations skills that will raise the level of service from KWA.

8. Community management and community initiatives in the bilateral supported schemes (such as fault reporting, cost recovery and sanitation) have been found to be very effective and successful. This element can be included to develop better institutionalised procedures in fault reporting and cost recovery in other areas.

9. From the exposure programme, it has been realised that many interesting activities/programmes are being carried out in the various Netherlands assisted programmes in India. We will be able to learn and gain more on utilising such efforts of NAPs by initiating mutual interaction and exchange of programmes.

10. The Government, together with the KWA has to project realistic financial planning in relation to physical achievement. This will enable the Government and the KWA management to work on sound financial footing. In the Netherlands, the estimated cost of schemes never increase to more than 10% of the actual costs. At least in the bilateral supported schemes, increased efficiency in project completion should be able to stabilise financial position.

11. In India there is a need for a single organisation or ministry to plan policy for water sources and water supply planning. The present urban and rural ministries have to be amalgamated. This would be ideal to establish effective co-ordination mechanism thereby avoiding duplication efforts for achieving the goals of providing water and sanitation facilities to the community.

12. At the national level, policy guidelines have to be issued for better cost recovery from standposts and handpumps. Policy level decision and strategy have to be developed for introducing this crucial concept in all states.

PROFILES OF PARTICIPANTS

Government of India

Mr.P.K.Sivanandan Director, Rajiv Gandhi Drinking Water Mission, and
Joint Secretary, Ministry of Rural development.

Uttar Pradesh

Mr.S.N.Shukla Chairman, UP Jal Nigam
Mr.R.S.Singh Managing Director, UP Jal Nigam
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Mr.R.Kondala Rao Engineer -in-chief Panchayati Raj
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Department(PRED)
Mr.T.K.Dewan Commissioner, Panchayati Raj, Rural Development and
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Kerala

Mr.N.V.Madhavan Secretary Water Supply, Irrigation Department.
Mr.M.P.Mohan Managing Director, Kerala Water Authority
Dr.K.Balachandra Kurup Executive Coordinator, Socio Economic Unit

Karnataka

Mr.A.S.Srikanth Director PPMU, Joint Secretary to Government

Gujarat

Mr.Gurcharan Singh Secretary Water Supply, Health and Welfare
Department
Mr.Batilal Kamdar Chairman, Gujarat Water Supply and Sewerage Board
Mr.C.B.Devadeth Chief Engineer, Planning

TIME SCHEDULE

Time Schedule Week 1

Day 1/ Monday April 11

a.m. Location IHE

06.15	Arrival in Amsterdam, transfer to Delft	Blokland
08.15	Registration and practical information	Bloemen
10.00	Programme information; Pre-course questionnaire	Blokland

p.m. Location: Novotel

16.00	Survey of water sector problems and expectations of course participants	Van Hofwegen
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Hotel: Rotterdam

Day 2/Tuesday April 12

a.m. Location: IHE

Opening programme: (09.00-10.50)

09.00	Opening	Segeren/Jansen
09.15	Development Policy of GoN	Veenstra
09.30	Development policy of GON in Water Supply and Sanitation	Ankersmit
09.45	Government Policy for Water and Sanitation Development in India	Sivanandan
11.00	Sector models and the new roles of Government	Alaerts

p.m. Location: Water Supply Company WZHZ

14.00	Visit Rotterdam Water Supply Systems	Willems
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Hotel: Rotterdam

Day 3/ Wednesday April 13

a.m. Location: VROM

SECTOR AND UTILITY MANAGEMENT OF WATER SUPPLY IN THE NETHERLANDS
REPORT FROM KERALA DELEGATION ON THE TWO-WEEK EXPOSURE PROGRAMME (April 11 - 28, 1994)

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|-------|--|-------------|
| 09.00 | Legal systems for drinking water supply in the Netherlands | Van Soest |
| 09.30 | Organisation and Legislation in India | Madhavan |
| 10.30 | National Water sector Planning | Ardon |
| 11.00 | State-level Water Supply Planning | Kondala Rao |

p.m. Location: Water Supply Company WZHO

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|-------|-------------------------------|------------|
| 14.00 | Visit major construction site | Boon/Mudde |
|-------|-------------------------------|------------|

Hotel: Rotterdam

Day 4/ Thursday April 14

a.m. Location: VEWIN

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|-------|---------------------------------------|-----------|
| 09.00 | The Netherlands Water Industry | Martijn |
| 09.30 | Sector organisation in India | Davada |
| 10.30 | Collective drinking water supply plan | Baltissen |
| 10.30 | Company planning in India | Shukla |

p.m. Location: Water pollution Control Board ZHE&W

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|-------|--|--------|
| 14.00 | Regional Water quality management in Netherlands | Meijer |
| 15.00 | Visit Rotterdam wastewater system | Meijer |

Hotel: Rotterdam

Day 5/ Friday April 15

a.m. Location: IHE

Thematic day on historical development of the drinking water sector in the Netherlands.

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| 09.00 | Innovations in Water treatment | Schippers |
| 10.00 | Netherlands water supply in historical perspective | Achttienribbe |

p.m. Location: Amsterdam Water Supply

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|-------|---|------------|
| 14.00 | The river-dune water system for the Amsterdam water | Schuermans |
| 15.00 | Visit of the Leiduin water treatment works | Schuermans |

Hotel: Rotterdam

Day 6/ Saturday April 16

10.00 Water Management City of Amsterdam Bloemen
Hotel: Rotterdam

Time schedule week 2

Day 7/ Sunday April 17

No programme

Hotel: Rotterdam

Day 8/ Monday April 18

a.m. Location: IHE

Thematic day on the participation of NGOs, Municipalities, and the general public in the policy and decision making processes in the water sector.

09.00 Men and women, water and waste: gender aspects in the Dutch water sector Van Wijk

09.20 Public relations policy of water supply companies in the Netherlands; aspects of the relationship with the consumer. Van der Woude

09.40 Formal and informal control of the Dutch water boards Jacobs

10.00 Environment and drinking water policy; The role of environmental organizations Matser

10.45 Forum discussion Schenk(Chair)

p.m. Location: PWN

13.00 The north Holland dune reserve Vandervegte/Korf/Roosma

15.30 Visit to the dune area to view dune Vander Vegte area management by water supply company PWN Korf/Roosma

Hotel: Leeuwarden(KE)/Utrecht (KA+CG)/'s Hertogenbosch (GU)/Velp (UP)/Gouda(AP)

Day 9/Tuesday April 19

a.m. Location: WLF for 3 participants from Kerala

09.00 General Management:

WLF:

Van Winklen/Hoffer

p.m. Location to be determined by the water company

14.00 Visit workshops, stores, distribution system

WLF:

Van Winklen

Hotel: Leeuwarden

Day 10/Wednesday April 20

a.m. Location: see April 19

09.00 Technical Management:

WLF:

Zweirsta

p.m. Location: to be determined by the water company

14.00 Visit workshops, stores, distribution system:

WLF:

Zweirsta

Hotel: Leeuwarden

Day 11/ Thursday April 21

a.m. Location: see April 19

09.00

WLF:

Twerda

p.m. Location: to be determined by the water company

14.00 Visit laboratories:

WLF:

Twerda

Hotel: Rotterdam

Day 12/ Friday April 22

a.m. Location:KIWA Nieuwegein

10.00 Research organization and programme of the
Dutch drinking water industry.

Schulting

11.30 Visit research laboratories

Schulting

p.m. Location:offices of the consulting engineers.

14.00 ETC/IHE (Kerala)

Todd/Blokland

14.00 ETC/IWACO (Andhra Pradesh)

Gussenhoven/Spit

Hotel: Rotterdam

Day 13/ Saturday April 23

10.00 Keukenhof
Hotel: Rotterdam

Bloemen

Day 14/Sunday April 24

No programme
Hotel: Rotterdam

Day 15/Monday April 25

a.m. Location: KIWA Rijswijk
10.00 Testing and Certification
11.00 Visit Laboratories

Meiburg/Bosman
Meiburg/Bosman

p.m.

14.00 Information and Communication in the sector
15.30 Training and Education for capacity building in the Indo-Dutch
water programme

van Damme
Blokland

Hotel: Rotterdam

Day 16/Tuesday April 26

a.m. Location: IHE
09.00 Post-course questionnaire; Programme evaluation
and follow-up

van Hofwegen

p.m. Location: DGIS/IHE
13.00 Debriefing at GoN-DGIS
17.00 Closing/Reception/Dinner

Veenstra/Blom
Segeren

Hotel: Rotterdam

Day 17/Wednesday April 27

No programme
Hotel: Rotterdam

Day 18/Thursday April 28

08.00 Transfer to Schipol and on to Delhi

Blokland

APPENDIX - 3

The planning context for drinking water supply

		Public Water Supply	Water management	Environment	Spatial Planning
National Government	strategic	BDIV	Water Management Policy Plan	National Environment Policy Plan	Physical Planning Report
	operational		National Waters Management Plan	National Environment Programme	
VEWIN	strategic/operational	Ten-Year Plan			
Province/ Water Board	strategic		Water Management Planning	Provincial Environmental Policy Plan	Regional Physical plan
	operational		Other Waters Management Plan	Provincial Environment Programme	
Municipality	strategic			Municipal Environmental Policy Plan	
	operational			Municipal Sewerage Plan	Local Physical Plan