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TOWARDS HEALTH FOR ALL BY  
THE YEAR 2000 IN THE EASTERN  
MEDITERRANEAN REGION OF  
THE WORLD HEALTH  
ORGANIZATION

نحو تحقيق الصحة للجميع بحلول عام ٢٠٠٠  
في اقليم منظمة الصحة العالمية لشرق  
البحر الابيض المتوسط

VERS LA SANTE POUR TOUS EN  
L'AN 2000 DANS LA REGION DE  
LA MEDITERRANEE ORIENTALE  
DE L'ORGANISATION MONDIALE  
DE LA SANTE

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#### THE VILLAGE IS HIGH AND THE WATER IS LOW IN THE YEMEN ARAB REPUBLIC

One of the major obstacles to the construction of water supplies in rural areas of the Yemen Arab Republic is its extremely high cost. Most of the villages are located high up on mountain peaks for reasons which in olden days pertained to defence. As a result, the majority of these villages have no easy access to safe sources of drinking water; they only have access to polluted water collected in ponds and cisterns. Accessible groundwater is in the valleys, sometimes several hundred meters lower. Therefore, the cost of supply systems to such villages is much higher than in other countries.

The Government of the Yemen Arab Republic is fully aware that the socio-economic development of the country is very closely connected with the people's environmental health. Rapid socio-economic changes caused by mass movement of rural populations to urban areas for a better livelihood, industrialization, intensive use of chemicals, fertilizers, insecticides and pesticides in agriculture and the development of new irrigation schemes are all factors likely to give rise to potentially harmful influences unless properly controlled.

The objectives and targets of the National Health Programme for environmental health problems are to extend coverage of the population with adequate safe water supply by the Ministry of Public Works and to improve solid wastes disposal and sewerage systems - in urban areas by the Ministry of Municipalities and in rural areas by Local Development Boards.

The tentative estimate under the last five-year (1976-1981) National Health Programme was to provide an additional 216 000 urban and 500 000 rural people with safe drinking water. This was to bring the total served population to 438 000 in urban and 720 000 in rural areas by the end of 1981. These estimates were based on the assumption that five major towns (Sana'a, Taiz, Hodeida, Ibb and Dhamar) would be provided with municipal water supplies and that the ten per cent of the rural population at present having access to proper water supplies would increase to fourteen per cent by the end of 1981. There are no proper sewerage systems in Yemen, but facilities will be provided to an urban population of 370 000 under the next Five-Year Plan (1981-1986). Similarly, there is poor rural sanitation, and efforts will be accomplished to improve excreta disposal in rural areas through basic health programmes.

#### Objectives of the National Health Programme (1981-1986)

The objectives of the National Health Programme for environmental health services are: to extend complete water supply and sewerage systems to the five major cities of the country; to study, design and complete 250 new projects; to improve 150 existing projects; and finally to drill 125 wells. All these will cost about 535.5 million Yemeni rials, i.e. the equivalent of \$120 million.

The Confederation of Yemen Development Associations (CYDA) and the Local Development Association (LDA) also have planned a very ambitious programme of integrated rural development and comprising 2661 water projects for 3712 villages, at a total cost of 1029 million Yemeni rials ( \$ 226 million).

### WHO Cooperation

The projects executed with WHO cooperation in rural water supply and sanitation have helped to set up and extend useful technical services in the Department of Rural Water Supply of the Ministry of Public Works, the Ministry of Municipalities and the Ministry of Health. These have resulted not only in the provision of safe drinking water coupled with sanitation, but also in a better understanding of these problems, of their complexity and of their high cost. Technical cooperation is being provided by WHO for institutional support to bridge a period of shortage of skilled manpower, and for the planning, investigation, surveying, designing, construction, supervision, operation and maintenance of water supply projects.

### The response of the community

In the Yemen Arab Republic as everywhere, the successful implementation of any environmental health programme needs the full understanding, support and active participation of the local community, coupled with health information and education based on local customs, traditions and beliefs. Therefore, community participation is encouraged and welcomed at all levels during the implementation of the projects. People now prefer to have a piped water supply and good sanitation in their villages. These healthy reactions have put the Government and its agencies under great pressure to respond to requests. The people do appreciate the convenience of a piped water supply system, but the present rate of construction needs to be increased. The Rural Water Supply Department receives more than fifty requests daily from all parts of the country. Some of the villages are abandoned by their inhabitants due to the lack of water. An appreciable change has been observed after the introduction of piped water to these villages. The people have migrated back to their villages and many have improved their social conditions in other ways such as by the installation of electric generators.

Not all the targets of the International Drinking Water Supply and Sanitation Decade (IDWSSD) can be achieved in time (1990) in the Yemen Arab Republic because of financial limitations, lack of manpower, the abnormally high cost of water supplies and institutional weaknesses which are being remedied. However, significant progress will be achieved if national efforts are pooled with international cooperation.

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### A NATIONAL WASTE MANAGEMENT PLAN FOR LEBANON

The Government of Lebanon has courageously agreed that current conditions in the country should not hamper the provision of the various services needed by the population and which have been lagging behind, particularly the most urgent works necessary to palliate the effects of the present state of affairs on public health and on the quality of coastal waters.

It took twenty months, in 1980 and 1981, for national and international experts to draft the Lebanese National Waste Management Plan which provides for the proper management of sewage, solid wastes, stormwater drainage; for water pollution control and for possible and appropriate re-use and reclamation. The Master Plan will be implemented over the next twenty years at a total cost of about L.L. (Lebanese pounds) 18,000 million, or \$ 3.6 billions. Cost of drafting the Master Plan was covered by UNDP funds, with WHO as the executing agency.

Solving the waste management problems of Lebanon will consequently require substantial commitments of capital. This means that the implementation of the Plan will call for significant investments and measures are being taken by the Government to attract potential investors, including Arab, US and European agencies and funds.

Most  
Urgent works

Urgent works, which spread over three years (1982-1984), include those projects which cannot lag behind without jeopardizing the health of the inhabitants of Lebanon and which can be executed relatively quickly at a cost of some L.L.600 million ( \$ 120 million).

They include among others the construction and rehabilitation of trunk sewers for large regional systems in Tripoli, Jounieh, North Metn, Ghadir, Zahle and Saida areas; the completion of previously designed sewerage systems in 61 communities; the construction of a demonstration wastewater treatment plant at Qabb Elias which will be used as a model for other similar plants in other parts of the country; the institution of sanitary landfills and the closure of unsuitable dump sites; the protection of water springs; the improvement of relief storm sewers and channels.

Further implementation of the Master Plan will serve a population of about 7 million in the year 2000, of which some 5 million (or 65 per cent of the total population) will live in the coastal areas of Lebanon.

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FACTS AND FIGURES ABOUT THE DECADE IN PAKISTAN

The present situation in Pakistan is that out of a total population of 83.7 million, only 34 per cent of the population is served with water supply, whereas modern sewerage and drainage facilities are available to about 13 per cent only. There is also a wide disparity in the availability of these facilities between urban and rural areas. This would be evident from the fact that, while in the urban areas safe water is available to 72 per cent of the population and sanitation to 42 per cent, in the rural areas access to clean water is available to 20 per cent only and sanitation facilities are virtually non-existent, being available to only 2 per cent of the population.

Realizing the importance of water supply and sanitation programmes, the Government of Pakistan laid down, as two of the major policies and strategies of the Fifth Five-Year (1978-1983) National Plan, the provision of safe water supply, particularly in rural areas, and an improvement of sewerage facilities.

#### Realistic targets

The targets of the Plan were realistically established so that from 1978 to 1983 the population served by water supply in urban areas would increase from 61 (in 1978) to 81 (in 1983) per cent, and from 14 to 36 per cent, during the same period, in rural areas. In the same time, the population served by sewerage and sanitation in urban areas would increase from 35 to 51 per cent by 1983, and rural sanitation from 0.25 to 3.5 per cent.

From 1978 to 1981, a total population of about 8.35 million have been supplied with water, including about 4 million in the cities, and 4.3 million in the rural areas. At the same time, sanitation has been provided to 2.64 million in urban areas and 460 000 people in rural areas.

As far as urban water supply is concerned, it can be forecast that coverage would reach 100 per cent of the population by 1990. This requires covering an additional 20 million people.

In the case of rural water supply, considering that there are some 45 000 villages in Pakistan, and starting from very low, a 100 per cent coverage by the end of the Decade would be impossible. It is proposed to increase it from 17 per cent in 1980 to 66 per cent in ten years, thus covering an additional population of some 39 million. The intention is to cover rural areas through the installation of hand pumps, storage reservoirs, shallow wells and piped water supply schemes. The plan involves the installation of 260 000 hand pumps in the country during the Decade. It is felt that coverage through piped water supply schemes can only be undertaken on a very limited basis because of the high cost per capita and the consequent resource constraints. Such schemes are recommended for settlements between 2000 and 5000 inhabitants.

#### Sanitation

Urban sanitation coverage is proposed to be increased from 42 per cent (1981) to about 59 per cent in 1990, that is an additional population of about 11 million. Rural sanitation coverage, which is at present almost non-existent, is proposed to be provided to 13 per cent of the population by 1990, which means about nine million people. The system proposed consists of simple open drainage for conveying solid and liquid wastes away from communities.

Of the \$ 1426.3 million foreseen by the plan, one billion dollars are expected to come from the country. It includes resources provided by the Federal and Provincial Governments, development authorities and local councils.

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#### RURAL WATER SUPPLY IN SOUTHERN SUDAN

Although the Southern Region of the Sudan, which is roughly that portion of the country which lies south of the tenth parallel, is endowed with relatively high rainfalls (between 25 cm. and 1.4 m. per year), good drinking water is on the whole a very scarce commodity. This is partly due to the unfavourable distribution of rain over the year, partly the result of adverse geological formations of the underground which is largely rocky. In fact, part of the region is universally regarded as being drought-prone.

Many diseases are common among the 3.5 million inhabitants of the region. Malaria, sleeping sickness, schistosomiasis, leishmaniasis, dysentery, worm infestations, leprosy and sexually transmitted diseases are still rampant. A great deal of illness is related to water-borne diseases. As a result, life expectancy is only about 45 years.

Apart from WHO, a fair number of bi- and multilateral agencies, especially UNICEF and the Norwegian Church Aid, have for some time made great efforts to improve the situation, but overall progress is still too slow.

Therefore, WHO started a UNDP-funded project (see EMR Newsletter No. 2/1980) to cooperate with the regional authorities in developing their own capabilities and mobilizing on-the-spot resources to speed up development. The project was designed as a blend of institution-building and direct support considered optimal to achieve the project's goals.

However, the year 1981 turned out to be a difficult one for the Sudanese economy, especially as regards foreign exchange holdings, so the Government tried to boost export by directing all available financial resources towards this purpose. Consequently, international funds originally earmarked for the rural water supply project were no longer available.

As a result the project ran into great financial difficulties and activities have to be slowed down considerably - a real calamity when seen against the background of the International Drinking Water Supply and Sanitation Decade.

WHO nevertheless managed to provide as much money as possible from its regular budget in order to fill major financial gaps. An amount of US\$ 100 000 was provided in 1981 for the purchase of urgently needed workshop tools and equipment. In 1982, WHO will recruit an external workshop specialist to ensure minimum interruption due to repair of vehicles and equipment. WHO will also provide a consultant to assist in the design and introduction of a drinking water quality control programme, and is furthermore considering to fund the project's 1982 fellowships programme.

What WHO cannot do is to provide money for the purchase of two or three drilling rigs, as well as pipes and pumps urgently needed to expand the rural water supply programme for which the project has already provided the necessary infrastructure. Two to three complete drilling rigs could be manned and put into operation immediately if they were available from outside sources.

Likewise, construction teams could be mobilized to mount the hand pumps and make them work. Efforts have therefore to be directed towards finding additional external financial aid.

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#### RE-USE OF WASTE WATER IN SAUDI ARABIA

##### How to save water in arid zones

Properly treated waste water presents a positive contribution to the problem of water shortage. WHO, therefore, encourages irrigation with wastewater, provided adequate health safeguards are employed.

A WHO consultant discussed with the Ministries of Health and Agriculture of the Kingdom of Saudi Arabia the implementation of projects for re-using wastewater in agriculture, in connexion with the health hazards involved in the use of sewage effluents for irrigation. To be re-used, wastewater has to meet required standards of purification.

##### A problem for arid zones

As in many other arid areas, the scarcity of water has been restricting the rapid development of the Riyadh urban area. The annual rainfall is on an average only about 80 mm. (8 cm), very variable, and the evaporation is extremely high. The Ministry of Agriculture and Water thus recognized the need for a monitored re-use of wastewater to irrigate the farming estates of Dariyah (750 ha, 10 km northwest) and Dirab (850 ha, 30 km southwest) near the capital city.

The Saudi Arabian Government has already tackled the problem of treating wastewater for possible re-use. The first Riyadh Sewage Treatment Plant went into operation in 1977 with a capacity of 40,000 cubic metres. (40 million litres) per day. In 1980, the capacity was extended to 80,000 m<sup>3</sup>/day. Since 1980, another expansion of the plant to a total capacity of 200,000 m<sup>3</sup>/day is under construction and expected to be completed early in 1983. In addition, a project for a new sewage treatment plant with a capacity of a further 200,000 m<sup>3</sup>/day is in its final stage of design. The newly designed plant will have the potential to produce an effluent suitable for unrestricted irrigation if properly operated.

##### Is re-used water safe?

Like some cholera outbreaks which occurred in several countries of the Region due to the use of polluted water for irrigation of vegetables and other crops have shown it, many public health aspects are related to the re-use of wastewater, particularly: the transmission of communicable diseases, especially enteric, the propagation of insect vectors of other communicable diseases; and illnesses resulting from the presence of toxic chemicals in the water.

Microbes excreted by sick as well as apparently healthy people may be transported by water and adversely affect the health of those who come in contact with wastewater unless it has been adequately treated.

The existing projects in Riyadh are associated with the re-use of wastewater for agriculture and recreation.

From a health point of view, the effluent from sewage treatment plants can be used for restricted irrigation, where waste water does not come in direct contact with crops such as vegetables and fruits, or where these products are not eaten raw. Restricted irrigation also comprises the watering of trees in gardens and parks.

### Two big projects

There are two big projects planned to use the effluents of wastewater treatment plants mainly for irrigation of date palms, fodder, vegetables, fruits and wheat in Dariyah and Dirab. The main irrigation method is surface irrigation practised by means of basins and furrows.

In order to keep a balanced supply of water, it is planned to construct storage ponds (reservoirs) on the crest of an escarpment within each irrigation area. These ponds would also serve for recreation.

The construction of the pipelines for transporting the effluent to Dirab is almost completed and it seems that the irrigation scheme will go into operation within the next few months. The irrigation project for Dariyah is less advanced, although the pipelines are already under construction.

There are also plans to improve and extend the green areas in Riyadh by using treated wastewater for irrigation of public and private gardens, green belts, recreational parks and sport fields.

Wastewater effluent becoming available could also be an asset for industry. At present, the Petromin oil refinery is already using wastewater mainly for cooling.

### Water-saving devices

Apart from the correct re-use of wastewater, another way of saving water in arid zones is the use of water-saving devices, such as for instance toilets which need much less water for flushing. By adopting these methods, the per capita water consumption could be reduced considerably. The use of such facilities is especially useful in arid areas where the water has to be desalinated at a very high cost and transported sometimes over a hundred kilometres as is the case in Riyadh.

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#### NO WASTE SHOULD BE WASTED IN SYRIA

According to a WHO consultant who recently visited the Arab Republic of Syria, we are now entering the period when it is becoming economical, technically possible and environmentally desirable to make full use of our wastes. Therefore, the full use of refuse, both by composting and biogas, should be the methods to be considered for the future in any country, including Syria which has a particular need for compost and, as yet, has no oil.

#### Compost and biogas

The WHO consultant computed that the refuse collected in the whole country could provide about one million tons of compost every year, enough to cover 90 000 hectares (222 000 acres) of agricultural land. There is a great need for organic fertilizer for the soils of Syria and a strong demand is already evident, in that a good percentage of the half rotted-down refuse from the present dump sites is already collected by neighbouring farmers, even though there are many undesirable contents in this refuse such as plastic, tyres and the many other items which are not biodegradable. This shows the real demand there is for compost, and the refuse is ideal for composting - the proper way to utilize it.

The other method of disposing of solid and liquid wastes, the WHO consultant goes on to say, is the making of biogas from the refuse. Whether this is likely to be an economical method or not has to be further studied in Syria and elsewhere. It must be emphasized that biogas production from municipal refuse is a relatively new technique which has only come to the fore in recent years, due to the increase in energy costs. Although there are some one million small biogas plants in China, larger plants are only now coming into operation. As far as Syria is concerned, the WHO consultant thinks that the method holds particular promise for smaller towns.

#### Dustbins versus plastic bags

In the consultant's opinion, the presence of large amounts of plastic in the refuse is unfortunate because:

... Plastics originate from oil and should not, in the future, be used as "throw-away" items. Plastic is far too valuable and may become in shorter and shorter supply in the future.

... Plastic is not biodegradable.

... It must be removed during the composting process.

The presence of large quantities of plastic in the refuse is due to the large-scale use of plastic bags to collect refuse. This sets the ever recurrent problem of dustbins versus plastic bags. Although all specialists are fully aware of the convenience of plastic sacks for refuse collection,

it is nevertheless cheaper and better to encourage the use of dustbins. Although initially more costly, they do not have to be replaced daily. They also have the inconvenience that they must not only be taken from the house for collection, but must also be returned to the house - and cleaned. Plastic sacks have the disadvantage of being destroyed by stray dogs and cats. This matter requires careful thought and the best method for the individual storage problem, whether by dustbin or plastic sack, should be chosen on balance.

#### Syria's Five-Year Plan for Solid Waste Management

The WHO consultant was stricken by the cleanliness of the capital city Damascus, although its population has increased very rapidly. Refuse collection and treatment in Damascus are not the Cinderella of the municipal services, but on the contrary have the full and serious attention of the officer-in-charge and his staff.

The Syrian Government's Five-Year Plan for the improvement of solid waste management in general throughout the country includes among other things:

-- The improvement or construction of composting plants in Damascus, Aleppo, Homma, Lattakia and ultimately other centres. The new sewage works in Damascus are to be integrated with the proposed composting plant so that both the sewage effluent and solid wastes could be composted together.

-- The building of refuse treatment plants at each large centre.

-- The use of a new sanitary landfill near Damascus. The site is surrounded by high wire netting to prevent air-blown litter and is provided with a warden's house and office. Open lorries should also be netted or covered to avoid litter blowing off on the way to the tip and spoiling the countryside.

-- Instructions in the Arabic language will be provided to all refuse collection and disposal staff (scavengers).

#### Advice to the public

As in the case of other countries in the Eastern Mediterranean Region, the following advice is drawn to the attention of the public by the WHO consultant: It is absolutely essential that each householder maintain a storage container, which must be covered, for his refuse. This, in its simplest form, could be an old tin with a lid; it can also be a dustbin or a plastic sack. Conventional dustbins are nevertheless preferable. These containers, whatever they are, must not be emptied on to the ground. This, according to the WHO consultant, is the Golden Rule of garbage collection.

"WHEN REFUSE HAS BEEN COLLECTED INTO A CONTAINER NEVER NEVER EMPTY IT ON TO THE GROUND BECAUSE IT TAKES MORE LABOUR TO LOAD IT AGAIN THAN IT DID TO COLLECT IT; WHEN TIPPED ON TO THE GROUND IT LEAVES ITEMS ON WHICH FLIES LAY THEIR EGGS AND THE WIND BLOWS IT AND LITTERS THE SURROUNDING AREA".

Respecting this one simple rule does more for the cleanliness of a city, town or village, than any other single action. It also makes for economy.

Finally, the best possible public cooperation should be encouraged, for without it solid waste management is a formidably difficult, if not impossible, task.

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MANY PEOPLE DRINK UNSAFE WATER

Water quality guidelines for the Decade

Scientists from 18 countries, including Tunisia and Sudan, experts in epidemiology and toxicology and associated fields, have met at WHO Central Office in Geneva to draw up new Guidelines for Drinking Water Quality which will supersede the existing WHO International and European Drinking Water Standards.

This meeting sees the culmination of two and a half years' intensive work by scores of individual scientists in all parts of the world. During that time they have reviewed the available information on contaminants in drinking water and their possible effects on human health; their findings form the basis for the guidelines, which cover various microbiological and biological organisms, inorganic and organic chemicals and other constituents. The fact is, despite considerable investment in drinking water supply in the developing countries, many people drink unsafe water, and the resulting impact on health and the economy is considerable. Water-borne diseases are among the most frequent and most deadly ones in the developing countries, and many industrialized countries too are well aware of the risks of disease outbreaks. The international traveller will be all too conscious of the hazards from personal experience.

The prime objective of the International Drinking Water Supply and Sanitation Decade (1981 - 1990) is to secure adequate and safe water supply for people in all countries in the world. The development of WHO's guidelines on drinking water quality forms an important element of this programme with regard to the protection of public health.

The Danish International Development Agency (DANIDA) provided substantial resources for the preparation of the guidelines, and it was at its suggestion that water quality problems in the less developed countries have received special attention. The United Nations Environment Programme (UNEP) cooperates with WHO in many aspects of the work in the environmental health field.

Other international organizations, such as the World Bank, UNICEF and UNDP, who all contribute funds to the Water Decade, would derive considerable benefit from the development and utilization of the Guidelines. At present, much of this investment is not achieving its full benefit because the water

provided to people does not meet sanitary requirements, partly because the funds are often focussed on pipes and pumps rather than on people and water - particularly water quality.

WHO Member States encounter a wide variety of problems in relation to water quality. For example, in many of the less developed countries microbiological aspects are of paramount importance, whereas in industrialized countries, especially in Europe and North America, there are increasing problems resulting from the proliferation of potentially harmful chemicals, which threaten both surface and ground water sources of supply.

When published later this year, the new Guidelines will include extensive reviews of the medical and scientific rationale on which the guideline values are based, as well as proposals for practical measures which must be planned and funded so as to assure safe drinking water quality to everybody, possibly by the end of the Decade (1990).

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