WORLD HEALTH ORGANIZATION
REGIONAL OFFICE
FOR THE EASTERN MEDITERRANEAN

ORGANISATION MONDIALE DE LA SANTE
BUREAU REGIONAL
POUR LA MEDITERRANEE ORIENTALE

SEMINAR ON SANITATION PROBLEMS OF RAPID URBANIZATION

Lahore, 7-14 October 1971

EM/SEM.SAN.PROB.URB./5
19 August 1971
ENGLISH ONLY

ENVIRONMENTAL HEALTH PROGRAMME OF WHO AS RELATED TO URBAN DEVELOPMENT

I INTRODUCTION

The rapid growth of cities in our times remains one of the most striking examples of present development trends in the countries of the world. With the advances of science and technology and their application to many a land and community, the cities of the world have been provided with facilities - unthought of a few decades ago - such as modern transportation and services, public utilities and expanding industries, which have made them centres of attraction for rural population. With few exceptions, the flow of people from the country towards cities is increasing all the time, specially in the African and Asian continents including the Eastern Mediterranean Region of WHO. This continuing expansion of metropolitan areas is "perhaps the greatest single problem facing man in the second half of the twentieth century", as rightfully pointed out by the WHO expert committee of the environmental health aspects of metropolitan planning.(1)

This accelerated urbanization refers in effect to a complex process of socio-economic changes affecting most, if not all, countries. It is characterized by the building up or expansion of ever larger urban centres and, concurrently, by the migration of people towards them and their settlement entailing profound changes and unavoidable problems in their mode of life.

Historically, cities, like nations, have risen and declined in accordance with the alternation of environmental conditions, favourable or antagonistic to economic and political strength and to the maintenance of health. The current process of urbanization appears however to be irreversible at present and unlikely to stop. This is due to a multiplicity of causes, one of which is the spectacular expansion - some would say explosion - of the world population which is increasing, unbelievably, at the tremendous rate of about six million persons a month at present.(2) It is expected that by the year 2000, should this trend continue, the world population will reach 6.13 billions.(2) In some countries, like the USA, as much as 85 percent of the population is expected to live in urban areas.(3)

Yet the movement of people to and from the country does not necessarily constitute a problem in itself. The life of an agglomeration of human beings depends, after all, on this continuous exchange. The problem arises only when and where there is a shortage or a lack of adequate facilities for the incoming flow of people.

Over the years, the environmental health problems of cities have become well known and also the methods of dealing with them. But as populations grow, new problems have arisen and the old have become more serious, owing mainly to this variety of social, economic and industrial changes.

In short and as stressed by the World Health Organization in respect of the environmental health needs of metropolitan areas (4): "Metropolitan life has its gratifying aspects ... on the other hand, uncontrolled metropolitan growth is disquieting because of the encroachment of space (in terms of land, air, and water), the potential spread of diseases and the threat to health from noise, over-crowding and the general degradation of man's physical and social environment". That's where the World Health Organization could step in and, if required, offer technical assistance towards the solution of such problems with the necessary cooperation of member states and other international organizations concerned.

The following outlines WHO's endeavour in some of the fields mentioned above:

II WATER SUPPLIES

The importance of safe water supply from the public health standpoint, is evident. It may be difficult, obviously, to establish with figures, the exact benefit derived from providing to a population an adequate and safe supply of water. However, a relatively clear picture can at times be obtained through surveys undertaken by countries interested. It is worth mentioning in this respect, the statement made at the 22nd World Health Assembly by the delegate of one Asian Government, to the effect that statistical studies had revealed that water-borne diseases in his country accounted for 60% of all morbidity and 40% of all mortality.

Although it is realized that such figures cannot be representative of the situation in other countries, the fact remains that adequate water supplies are of primary importance for public health ; that governments are more than ever aware of it and that they are increasingly requesting assistance in this regard from bilateral sources and international agencies notably from WHO.

The WHO programme of water supply was in fact initiated in 1959 at the request of Member States in a resolution adopted by the 12th World Health Assembly.(5) The need for such activities was later on confirmed in subsequent World Health Assemblies. The initial stage of the programme was to be concerned with the definition of the problem on a world-wide basis. Accordingly, a study was undertaken by WHO which demonstrated the magnitude and the complexity of the task. This study covered 75 urban water supplies in developing countries and revealed that about 1/3 of city dwellers were supplied with piped water in their homes, that one third had access to piped water, whereas one third was forced to obtain their water from unsuitable and insanitary sources.(6)

This was followed by activities aimed at promoting the development and/or expansion of water supplies in metropolitan areas involving also, where required, the assistance of the Organization towards the formulation or strengthening of water supply programmes on a national basis, the setting up of water authorities, and assistance in the preparation of pre-investment surveys under UNDP/SF financing with a view to execution.

This assistance from WHO has expanded and the number of WHO staff members (field and others) engaged, at present, partly or wholly on community water supply projects is 180, assigned to 85 countries. They include 132 sanitary engineers, the remainder being sanitary chemists, sanitarians and related technicians.(7) In connection with this programme a number of documents and monographs have been published by WHO, among which mention should be made of the "International Standards for Drinking Water" which has proved useful to a number of water agencies and the 3rd edition of which is now under preparation. Various technical meetings of scientific groups, expert committee meetings and seminars have also been convened for the benefit of scientists, professionals and water supply technicians throughout the world.

The work of WHO in persuading an increasing number of governments to give particular attention to water supplies is somewhat reflected in the following table on this Organization's activities in the field of Community Water Supply(8) and also in Annex I.

CWS Activities from 1961 - 1971						
Year	1961	1963	1965	1967	1969	1971
Number of activities	101	106	106	207	249	239
Number of countries & territories assisted	49	63	70	83	89	85

In this Region, some important projects are being carried out with WHO assistance under the UNDP Special Fund programme. They include the water supply projects for the cities of Sana'a and Hodeida in Yemen and in Afghanistan for the city of Kabul. Both projects are in the order of a million US dollars.

In addition, this Organization has been carrying out a programme for research and development which has culminated in the establishment of an International Reference Centre at The Hague and various national collaborating

institutions, the number of which has now reached 24. The aim of the programme in brief is "to reduce the costs of construction and operation of water works, improve the efficiency of management of these works and encourage the provision of more and better supplies to serve larger numbers of people at a price which they can afford".(9)

At the recent conference on Water Supply Research held in October 1970 under the auspices of WHO in Dubrovnik, Yugoslavia, with the co-operation of the Reference Centres, leading scientists in the field of water supply including the directors of a number of research institutions, were brought together to discuss research and development practices, so that a coordinate approach - which is essential to minimize duplication - could be made to these problems. In this respect, it is believed that WHO may eventually be called upon to play a bigger part, along the above lines, in this promising field of research and development.

As for the future, reference is made to the targets of WHO in the field of Water Supply which were set, as part of the objectives for the U.N. Second Development Decade, according to the following:(10)

Urban Supplies

(a) Present position (in the world): 25% of urban dwellers supplied in houses or courtyards and 26% supplied from standpipes.
(b) Decade target: 40% to be supplied in houses or courtyards and 60% to be supplied from standpipes.
(c) Construction costs for this programme (in the world): 7.5 billions US dollars.

In this Region it is estimated that 45 million people are at present served as indicated above, and that another 45 million more will be added in respect of urban areas by 1980. This general programme shall, of course, be based on sound forward planning in accordance with local needs and possibilities within national economic planning. The cost of the water systems required is expected to reach in this Region, some 600 million US dollars.

It is fully realized that financial assistance will have to be requested in the form of loans and grants from international and bilateral sources, but it should equally be stated that the bulk of the capital will, eventually, have to be met by the Member countries themselves, if they indeed wish, as it is hoped, to implement this most needed programme.

III WASTES DISPOSAL

The collection, treatment and disposal of liquid and solid wastes has become a serious problem, as a result of the considerable growth of urban areas, due to rapid urbanization and industrialization. Where proper disposal systems for such wastes are inadequate or lacking, there exist in general, problems of water and soil pollution and propagation of flies, mosquitoes, rodents and other vectors of diseases, which constitute a threat to the health, economic development and well-being of the community. This would apply to the many developing countries where sewerage systems and sewage treatment plants are limited in extent and capacity, or simply lacking.

Special problems are posed in such countries notably in respect of old crowded cities where the construction or expansion of sewers have often to await the implementation of general development plans, which takes years to realize and are sometimes carried out in accordance with 5 or 10 years government programmes. The provision of sewage disposal facilities even on a temporary basis, pending the construction of adequate systems, constitute also a problem that the municipalities and the health authorities must face.

Another difficulty is created by the wastes from the growing number of industries. These wastes are of a different nature and may cause damaging effects on sewers and sewerage treatment plants as they usually contain many corrosive organic or inorganic chemicals. They are also likely to use up most if not all of the dissolved oxygen in a stream if discharged into it. The disposal of effluents from industries must therefore be properly controlled.

A third serious problem is that of the disposal of solid wastes which include refuse from municipalities and solids from the treatment of sewage and industrial wastes. It has been established that the quantity of such wastes is increasing practically everywhere, yet very little has been achieved in most developing countries towards their satisfactory disposal.

The health implications resulting from this situation are obvious. In two different meetings of experts convened by WHO to discuss respectively the results of "Environmental change and resulting impact on Health"(11) and the "Treatment and disposal of wastes"(12), due consideration was given to these problems. Emphasis was laid on the importance of and the need for adequate disposal of various types of wastes, while Member States were urged to take adequate measures for the satisfactory management and disposal of these wastes. This is one of the ways in which WHO may be of assistance in this field by focussing attention on the magnitude of the problem through the reports of such scientific groups, also by carrying out surveys if requested and recommending solutions.

As may be realized, WHO is an international agency for technical assistance, which may be called upon and is, in fact, most willing to advise member countries in establishing satisfactory methods of collecting, processing and disposing of municipal sewage, refuse and industrial wastes. Mention can be made that the Organization has for instance, helped in drawing up plans for sewage and refuse disposal for the metropolitan area of Manila, Philippines, and similar projects in Bangkok, Thailand, and Ibadan, Nigeria. Also a scheme for combining sewage sludge and refuse to make compost has been studied for Malta.

In this Region, assistance is being provided or is in the process of being given to Iran, in connection with sewerage and drainage project for Teheran, to Syria and Lebanon, in connection with sewerage and waste disposal project for Damascus and the whole of Lebanon respectively. These projects are concerned with pre-investment surveys which are required to determine, inter alia, the feasibility and the extent of financial

obligations that will be needed in the design, planning, execution and also management and operation of such undertakings. This pre-investment planning is of particular importance for large-scale projects because of their magnitude and duration and the amount of money involved. Studies are carried out under the UNDP/SF programme by consulting firms under contract to WHO acting as executing agency and are used to serve as a basis for securing money from international sources or banking institutions for the execution of the projects.

Very often, however, this Organization will emphasize the need for combined water supplies and sewerage studies, except where the water supply is satisfactory or is already being expanded. With the exception of the water supply projects for Cambodia, all the other approved Special Fund projects listed in Annex I are concerned with waste waters in addition to water supply.

Another aspect of WHO works in this field is the provision of consultants to advise on specific aspects of long-term waste management programmes. Over 30 countries have been assisted so far, including in this Region, Syria, Libya and Tunisia. In the European Region and in the Americas, short courses and seminars on the disposal of waste water and solid wastes have been organized with considerable success. A useful WHO sponsored course on waste disposal was also held in this Region in May 1968 in Damascus.

On the recommendation of the Scientific Group on the Treatment and disposal of solid Waste, a research and development programme was drawn up in 1966. This programme is being carried out by the WHO International reference centre which was set up in Zurich, Switzerland, in 1968. The objectives are to disseminate technical and scientific information on wastes management and control practices; to coordinate research, eliminating duplication of efforts and reducing the time-lag between research and application; also to train personnel and serve as an advisory body for both developing and developed countries. The work of the International Reference Centre will be extended by WHO collaborating institutions, 27 of which had been designated in various parts of the world by March 1971. The following activities are but a few of the research work being carried out:(13)

- Tertiary treatment of domestic waste-water
- Low cost waste-water treatment methods
- Optimum utilization of treated and untreated sewage for irrigation
- Reclamation of waste-water and industrial effluents for domestic and industrial use.

Technical documents and monographs have been published and also a series of industrial-waste guides, three of which have been already distributed to governments and agencies concerned.

The importance of a comprehensive approach to the complex problem of waste management and the need for joint efforts is increasingly recognized. "It should equally be clear, beyond doubt, that if the challenge of environmental deterioration is to be met even minimally, a very great effort is required in co-operative national and international research and in the application of knowledge." (14)

IV ENVIRONMENTAL POLLUTION

Environmental Pollution can be defined as an alteration of the "ecological balance that must exist between man and his environment in order to ensure his well-being". (15) Environmental health aims at the restoration of that balance.

Pollution relates to the whole environment and may affect in varying degrees any or all of the elements of air, soil and water. There is a correlation in general between the various forms of pollution. Owing to population growth, urbanization and industrialization, the problems of environmental pollution are increasing almost everywhere, both in extent and complexity. Efforts to prevent further deterioration of the environment need accordingly to be expanded.

In tackling these problems, account must be taken of a variety of factors since environmental pollution is not only a public health problem, but also an economic and social one, often with legal, administrative and political implications. Excessive water pollution, for example, is already a factor limiting productivity in some countries hence affecting economic and social development.

In most developing countries the problem is of course far from reaching these proportions, yet measures for prevention and control should be encouraged to avoid further deterioration of the environment.

In the control of pollution, the basic problem is to determine the level of pollution which will permit optimum economic and social development without undue health hazards. One of the primary objectives of the WHO programme in this field is to study the effect of pollution on man and the environment in order to arrive, eventually, at internationally acceptable environmental quality criteria and guides to assist member countries in setting up environmental quality standards.

These terms were defined in respect of air pollution by the WHO Expert Committee on Atmospheric Pollutants (16) and were later adopted with slight amendments, as below, by the WHO Expert Committee on National Environmental Health Programmes so that these definitions would apply to the environment in general (15).

1) Criteria for guides to environmental quality are the tests which permit the determination of the nature and magnitude of the effects of certain environmental factors on man and his environment.
2) Guides to environmental quality are sets of levels and exposure times that are associated with specific effects of varying levels of environmental factors on man, animals, vegetation, and the environment in general.

To the above should be added the definition of standards of Environmental quality as proposed by the same expert committee on National Environmental Health Programmes:

> Standards of environmental quality are guides that have been adopted by governments and other competent authorities and therefore have legal force. In some contexts, however, standards may include recommendations that need not be rigidly enforced.

The prevention and control of pollution will require a clearer understanding of the process of generation and distribution of pollutants in the environment and their effects. Obviously the control of pollution is essentially a technological problem. Note should be taken however that there are also other methods of control which involve town planning,

siting of industry, transportation policies, legal action and administrative procedures. The WHO programme in environmental pollution consists, basically, in providing technical guidance; collecting and disseminating information on the prevention and control of air, soil, surface and ground water pollution; in stimulating research and encouraging the training of personnel in this field.(17)

This programme has received guidance from the expert committees on water pollution control (18 & 19), one expert committee on Environmental Pollution Research(20) and three committees on Air Pollution (21, 16 & 22). In addition several scientific groups and seminars have been organized by WHO to review new developments and exchange experience on these subjects, while specific studies have been made by a number of consultants and technical papers and monographs published. The following may be mentioned as a brief summary of some of the work done with WHO assistance in the fields of Water and Air Pollution.

The problem of Water Pollution has been extensively investigated in European countries since 1952. The quality of various bodies of water and coastal waters has been studied in a number of countries, mainly in the Americas and Europe. Problems arising from water pollution in river basins have also caused concern and assistance has been given in carrying out jointly with UNDP/SF a project in Poland for the protection of rivers against pollution. Other countries for instance Iran, are now interested in implementing similar schemes.

Research centres have been established, such as the Nagpur Central Public Health Engineering Institute in India, or are being assisted, for example the Federal Research and Development Centre for Environmental Pollution Control in Czechoslovakia and the Development of Research and Environmental Pollution programmes in Sao Paolo, Brazil. Several other countries have expressed interest in undertaking similar activities with WHO's help and this is being pursued.

In this Region, the gradual development of the water carriage system for evacuation of human wastes has at the same time brought about some problems of stream and coastal pollution due mainly to the fact that

municipal sewage effluents are often not treated or subjected only to preliminary treatment. The problem is becoming more acute in a number of cities as the wastes have grown in variety and magnitude notably in the field of chemicals. Consultants have been provided already to seven countries of the Eastern Mediterranean Region and surveys have been carried out. Stream and effluent standards have been proposed and relevant recommendations made. It is intended that this programme will continue and that a seminar on water pollution will be held next year to discuss the problems of this Region.

In air pollution control, WHO has provided assistance to many countries. Great success has been achieved in the American region where monitoring stations have been set up in many large cities. An Institute for Occupational Health and Air Pollution research was established in Chile and in London the Medical Research Council was designated as the WHO International Reference Centre on Air Pollution.

In this Region, however, problems of air pollution are not acute except in limited areas or in a few big cities. The Regional Office for the Eastern Mediterranean has convened in 1969 in Teheran, a seminar on air pollution in which these questions were discussed. Eleven countries were represented.

It is very likely that the interest of Member States in environmental pollution will increase as a result of present development trends as related specially to metropolitan areas and that the help of the Organization will be sought more often in the next few years.

V SANITATION SERVICES AND HOUSING

Environmental health being related to the whole physical environment should remain one of the most important aspects of public health and as such should be given primary consideration not only in health programmes but in national development plans. This point was very much stressed by the WHO expert committee on National environmental health programmes (15) in their report on the Planning, Organization and Administration of environmental health programmes.

The concept of environmental health began with attempts to prevent and control communicable diseases which were considered to be caused by environmental factors such as impure water and unhygienic disposal of sewage. Engineering principles have been and shall of course continue to be applied concurrently with other methods for the solution of disease problems. This basic concept has now been extended to embrace the total environment including factors bearing on social and mental stress. Accordingly, emphasis is being shifted, notably in developed countries, to matters such as accident reduction and improvement of living conditions in urban areas, due attention being given, where required, to air pollution control. Also environmental health workers are turning their attention, among other things, to town planning, industrial designs, noise abatement and recreational facilities.

The implementation of environmental health programmes of all types presupposes however the existence, first and foremost, of an infrastructure capable of conducting effective planning and of advising Government agencies concerned. WHO has therefore continued to lay emphasis on the strengthening of national environmental health services where they exist or their creation with a view to enabling these services to participate in national health planning, irrespective of whether or not operational responsibility for certain categories of activities rest with the Ministry of Health. Environmental planning is seen in this context as the means to make environmental health programmes part of the government socio-economic plans and to establish the institutional and other conditions necessary for their execution.

Assistance to governments in organizing and strengthening their sanitation services has been carried out, since the inception of WHO, through advisory services involving the establishment of field projects or the provision of consultant services; also through the promotion and development of training courses, the granting of fellowships and the organization of seminars, symposia and similar meetings. Studies have also been made by WHO and monographs, documents and guides published that have been found helpful by Member States. The following table provides some information regarding WHO activities in the world in the field of sanitation services and housing.

WHO Assistance from 1949 to 1968 (23)

	Advisory Services No. of projects	Conferences, Seminars and Other Meetings	Fellowships awarded
Housing and urbanization	13	9	30
Food Hygiene	20	6	288
Training of Sanitary engineers	47*	20	
Training of sanitarians	38*	5	
Environmental Sanitation, Training, general			1950

The education programme of WHO in the field of environmental health has been directed not only to preparing fully qualified specialists in environmental health, but to giving fundamental instruction on sanitary services and techniques to engineering professionals and technicians of governmental agencies concerned with major works of public health importance, such as water supply, water disposal, housing, urban and regional planning and development.

In line with this programme and owing to the need for French-speaking engineers in a number of regions, WHO has helped establish in Rabat, with the assistance of the Government of Morocco, a Sanitary Engineering Centre which was officially inaugurated in January 1971. The Federal Institute for Water Supplies, Sewage purification in Zurich will cooperate in the practical training of the students. In many other countries the Organization has been sponsoring and assisting in the establishment of sanitary engineering courses at Engineering Faculties, where they do not exist. In this Region WHO is helping to strengthen such courses in Pakistan and Iran.

---

* Training projects as distinct from fellowships

The training of sanitarians continues to be an important element of most field projects of environmental health and basic health services. In this Region alone, WHO-assisted sanitation courses are being given in ten countries. It is felt that this effort is justified and needs to be expanded to include training, where possible, of a higher category of sanitarians capable of performing supervisory functions and assisting in the planning of sanitation programmes.

As regards the urban, residential and work environment, it is considered advisable by this Organization that Ministries of Health be assisted in strengthening their collaboration with the agencies responsible in these fields, where required, and in establishing channels of communication with these agencies where non-existent.

While housing ministries may orient their work towards the quantitative expression of housing programmes, the Ministry of Health shall ensure that the health aspects are properly considered in such programmes. It is planned that WHO assistance to governments will extend into the appraisal of the hygienic quality of the urban environment, as recommended in 1966 by the relevant WHO expert committee(24).

Yet the primary activity of WHO in the fields of housing, town planning and urbanization programmes has been to participate in or collaborate with the UN bodies and other specialized agencies engaged in these activities. WHO has meetings with members of the ACC inter-agency group on Housing and Urbanization to formulate policies, discuss concerted action and coordinate activities.

Close relations have been established with the United Nations Centre for Housing, Building and Planning and with the Economic Commission for Europe, Latin America and Africa. WHO experts have been appointed full time to work closely with the two latter commissions.

It might be appropriate to mention in respect of the environmental health needs of metropolitan areas that an estimate was made in the US which sets out some of the requirements for every 1000 new inhabitants as follows:(4)

1. an additional 100 000 US gallons of water a day
2. additional sewage treatment facilities for 170 lbs of organic water pollutant daily or 300 new septic tank leaching systems
3. 4.8 elementary school rooms and 3.6 high school rooms
4. US $ 114 000 more, each year, for running the schools
5. one additional hospital bed
6. more money for new public service employees

This estimate was made in 1955. Obviously the cost of providing such facilities have now very much increased.

VI CONCLUSION

As pointed out in this paper, WHO has always urged member countries to give high priority to environmental health programmes, in particular, those concerned with the provision of water supplies and sanitation facilities. It is thought that stronger emphasis should now be given also to other activities in this field, such as solid and liquid waste disposal, food hygiene and the public health aspects of housing and urban planning.

If adequate measures are not taken to counterbalance the interreactions between man and his environment due to the growth of population and rapid urbanization, the indications are that the adverse effects on man's health and well-being will increase sharply. It is true that science and technology are equally creating vast array of new problems, but they are also providing methods and means for controlling and preventing them and for creating a better environment. (14) It should be the duty of Health Ministries and other agencies concerned to give increased attention to environmental health and obtain that environmental health be represented at a high level in National Planning. After all it must be realized as stressed by the WHO Expert Committee on Planning of Environmental Health Programmes that in the long run, poor sanitation is just as expensive as good sanitation. (15)

ANNEX I

UNDP/SF ASSISTANCE - PRE-INVESTMENT STUDIES - URBAN AREAS(10)

UNDP/SF Water Supply Projects	Pre-investment Studies Project Costs			Year of approval	Date of completion
	UNDP/SF earmarking	Government contribution	Total		
	US $	US $	US $		
India - Greater Calcutta	706 400	344 900	1 051 300	1962	1968
Ghana - Accra-Tema	2 396 400	1 895 000	4 291 400	1963	1969
Senegal - Dakar and surrounding area	2 170 300	1 005 000	3 175 300	1965	1971
Malta - Islands of Malta and Gozo	809 900	579 000	1 388 900	1965	1971
Turkey - Greater Istanbul	1 473 370	980 000	2 453 370	1965	1970
Ceylon - South-west coastal area including Colombo	1 462 400	787 000	2 249 400	1967	1971
Uganda - Greater Kampala and Jinja areas	616 800	503 000	1 119 800	1967	1971
Morocco - Atlantic coastal zone and selected urban centres	1 606 000	1 090 000	2 696 000	1968	1972
Cambodia - Kompong Som (Sihanoukville)	687 300	372 000	1 059 300	1970	1972
Ivory Coast - Abidjan	503 100	530 000	1 033 100	1970	1974
Nepal - Greater Kathmandu and Bhaktapur	752 400	162 000	914 400	1970	1973
Surinam - Nation-wide planning	665 900	648 000	1 313 900	1970	1973
Yemen - Sana'a and Hodeida	847 900	95 000	942 900	1970	1973
Afghanistan - Greater Kabul	750 400	248 000	998 400	1971	1974
Kenya - Nairobi	666 900	346 000	1 012 900	1971	1974
Madagascar - Tananarive	842 100	200 000	1 042 100	1971	1973
Mali - Selected towns	557 400	149 000	706 400	1971	1973

ANNEX II

REFERENCES

1. Environmental Health Aspects of Metropolitan Planning and Development. Report of a WHO Expert Committee (Geneva, 1965) Wld Hlth Org. techn. Rep. Ser., No. 297, p. 9

2. Trends in Developing Countries. International Bank for Reconstruction and Development, August 1970

3. Today and Tomorrow in Air Pollution. US Public Health Service, Washington, D.C., Division of Air Pollution, Government Printing Office, PHS Publication No. 1555

4. Environmental Health Needs of Metropolitan Areas (1965) WHO Chron., 19, 139-145

5. Resolution WHA.12.48, Handbook of Resolutions and Decisions

6. Urban Water Supply Conditions and Needs in Seventy-five Developing Countries, Dieterich, B.H. and Henderson, J.M. (1963) Publ. Hlth Pap., No. 23

7. Community Water Supply - The Next Ten Years (1971) WHO Chron., 25 70-78

8. Community Water Supply Programme. Progress Report by the Director-General (1970), A23/P&B/5

9. WHO Community Water Supply and Development Programme (1968), Information Bulletin No. 1

10. Community Water Supply. Report by the Director-General on the Financial Consequences of the Programme for WHO (1971), A24/B/12

11. Environmental Change and Resulting Impacts on Health. Report of a WHO Expert Committee, (Geneva, 1964) Wld Hlth Org. techn. Rep. Ser., No. 292

12. Treatment and Disposal of Wastes. Report of a WHO Scientific Group (Geneva, 1966) Wld Hlth Org. techn. Rep. Ser., No. 367

13. IRCWD News, No. 1, March 1971 (WHO International Reference Centre for Wastes Disposal)

14. The Management of Community Wastes (1970) WHO Chron., 24, 206-215

15. National Environmental Health Programme: Their Planning, Organization and Administration. Report of a WHO Expert Committee (Geneva, 1970) Wld Hlth Org. techn. Rep. Ser., No. 439

16. Atmospheric Pollutants. Report of a WHO Expert Committee (Geneva, 1963) Wld Hlth Org. techn. Rep. Ser., No. 271

17. Division of Environmental Health - A description of its functions and programmes, WHO/EH/68.1

18. Water Pollution Control. Report of a WHO Expert Committee (Geneva, 1965) Wld Hlth Org. techn. Rep. Ser., No. 318

19. Water Pollution Control in Developing Countries. Report of a WHO Expert Committee (Geneva, 1967) Wld Hlth Org. techn. Rep. Ser., No. 404

20. Research into Environmental Pollution. Report of Five WHO Scientific Groups (1968) Wld Hlth Org. techn. Rep. Ser., No. 406

21. Air Pollution. Fifth Report of the Expert Committee on Environmental Sanitation (Geneva, 1957) Wld Hlth Org. techn. Rep. Ser., No. 157

22. Urban Air Pollution with Particular Reference to Motor Vehicles. Report of a WHO Expert Committee (Geneva, 1968) Wld Hlth Org. techn. Rep. Ser., No. 410

23. Off. Rec. Wld Hlth Org., 171, December 1968

24. Appraisal of the Hygienic Quality of Housing and its Environment. Report of a WHO Expert Committee (Geneva, 1966) Wld Hlth Org. techn. Rep. Ser., No. 353