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AIR AND WATER POLLUTION IN LATIN AMERICA

A. INTRODUCTION

The Executive Committee, at its 51st Meeting in September 1964, discussed the growing problems of air and water pollution in Latin America and suggested that the Director review and report on these situations. In response to this action, the Director has the honor to submit the following brief report, which discusses factors influencing problems in air and water pollution; reviews actions taken by the Organization in response to requests from the Governments; and outlines program activities the Directing Council may wish to consider in recommending a course of action the Organization should take to assist and support specific programs of the Governments.

B. DEVELOPMENTS INFLUENCING AIR AND WATER POLLUTION

Most Latin American countries have initiated significant programs to promote and accelerate industrial expansion - a vital part of economic growth. This trend further stimulates the widespread rural-urban migration. Currently, 50 per cent of the population of Latin America lives in urban centers, whereas six years ago the urban population was only 40 per cent. This trend of population shift to cities will continue - likely will increase. In most Latin American countries, 25 to 50 per cent of the total population resides in the few larger cities. Ten such cities already exceed one million inhabitants, with Buenos Aires, Rio de Janeiro, São Paulo, and Mexico City above four million. Lima, Santiago, Bogotá, and Havana each have about two million population, and Montevideo and Caracas are above one million. Most other cities are below 500,000, with the majority under 100,000. As expected, widespread problems of air and water pollution are more pronounced in the few major cities, with localized problems in the smaller urban areas. The principal industrial complexes are emerging in and around metropolitan centers. The population growth rate in Latin America is increasing (now 2.9 per cent per year), with urban growth more pronounced (now 5 per cent to 7 per cent per year). With urban and industrial growth, air and water pollution will spread.

Health-related problems of the environment are complicated not only by the fact of increasing population densities and industrial growth, but also by the technological changes taking place in the production and use of industrial products. Industrial processes and industrial products are changing so rapidly that the resulting impacts on health have not been adequately evaluated. In the past, the health problems of air and water pollution were related to microbiological contaminants. In the future, increasing attention must be given to microchemical pollutants - specially to synthetic organics. The great emphasis on rapid industrialization - and the urgency for such development - encourages Governments to minimize restrictions and obstacles to industrial progress. As a result, there are few regulatory controls to limit air and water pollution. There is little doubt that contamination of air and water resources will become more pronounced, with air pollution affecting wider land areas and water pollution affecting more and more miles of major waterways. Air and water pollution not only affects health and well-being of people but, if excessive, reduces land and water values and can limit industrial development.

C. THE PUBLIC HEALTH PROBLEM OF AIR AND WATER POLLUTION

Effective health-related programs and the devices for administering these programs must reflect emerging social, economic, and political forces. The task of statesmanship in public health is to recognize and anticipate these trends and to adapt to them the content of programs and the administrative structures and processes. Obviously, these adaptations must be based on sound technical judgments and on scientific appraisal of problems. For example, in the case of air and water pollution, the regulatory agencies must take into account the importance and urgency of industrial development and should not interfere with such progress through impractical regulatory controls. In other words, some deterioration of air and water resources must be accepted as the price of economic advancement. This is especially true in the early stages of industrialization. As the economy advances, this trend can be reversed. However, even in the early stages of development, the responsibility of health authorities for the health and well-being of people requires that contamination of air and water resources be kept within reasonable limits. To maintain this balance is not a simple task. The decisions are highly technical, and the economic implications are of major importance. For example, to reflect some order of magnitude, reasonable control of air and water pollution in the more critical situations in Latin America will cost about \$400 million per year over the next ten years. To this capital investment must be added the cost of operation and maintenance. These figures further emphasize the importance of a clear understanding of problems and needs and for sound technical judgments in determining the types and extent of wastes treatment works.

With respect to waste discharges from major industrial plants, appropriate consideration should be given to practical legal requirements for pollution control as part of industrial planning and urbanization. In general, it is more economical to provide for reasonable pollution control in

the location and design (including production methods) of industrial establishments than to correct excessive pollution after the industry is in operation. Technical assistance funds for this purpose should be included in development loans and grants.

As a combined effect of metropolitan growth with high population densities and expansion of industrial production, problems of air and water pollution are becoming more pronounced. It is clearly predictable that the impacts on health created by these forces will become more acute before they are alleviated. Taken together, these and related influences constitute in fact a description of the manner in which man's changing environment will affect his physical and mental well-being. These influences are pervasive and important. Their full significance does not emerge until they are viewed as a whole - in terms of the full implications of a modern, technologically inspired economy upon the total health and well-being of humans. It is, therefore, prudent to anticipate the extension of health hazards and related effects arising as a by-product of air and water pollution and to develop the scientific intelligence needed to determine when and how to apply corrective actions and remedial measures. It is in this area of need that the resources of PAHO might now be applied to assist the Governments of the Organization.

D. PRESENT AND FUTURE PLAN OF ACTION

Over the past two years, in response to requests from the Governments, the Organization has provided technical and consultant assistance to 14 countries on problems of air and water pollution. These include areas in Brazil, Uruguay, Argentina, Chile, Peru, Colombia, Venezuela, Mexico, and a number of Caribbean countries. This assistance involved a wide range of technical problems. For example, in Montevideo, acute beach pollution required a critical analysis of wastewater disposal, with cost data for alternate methods. In São Paulo and Buenos Aires, both air and water pollution were involved - including studies on control methods and the strengthening of organizational structures. In the Caribbean countries, there were a number of special industrial waste problems, and, in four countries, urban waste disposal was a factor. In Bogotá, the assistance was on operation of oxidation ponds; in Caracas, on metropolitan wastes; and, in Lima, on the effects of heavy industrial wastes discharges to the metropolitan sewerage system. An increasing number of countries are requesting assistance on studies of sewer outfalls, either to the ocean or to estuaries. As indicated, the PAHO assistance, rendered generally through specialized expert consultants, has been on a particular air pollution problem created by an industrial complex or on a particular water pollution problem of specialized industrial wastes or metropolitan waste.

Urban and industrial development in Latin America is now reaching levels where problems of air and water pollution should be viewed and analyzed on a broader basis. In general, excessive air and water pollution do not result from a single source or even a few sources, but is a result

of the composite pollution from concentrations of people and industry and the production and use of the products of industry. For example, water pollution should be appraised by major river basins in terms of the total contaminants discharged; water needs, uses, and values; and the ability of the stream to assimilate waste without serious deterioration. In like fashion, air pollution should be appraised on an area basis in terms of the total gaseous discharges and their composite effects and on the meteorological conditions of the area. As these examples imply, there is need for improved laboratory facilities and for more technical manpower to carry out at least minimum monitoring services in the more congested areas of Latin America.

As a move in this direction, the Organization is now developing, in cooperation with the Governments, a network of air sampling stations, including a system of analysis of air samples. Initially, the network will include ten key cities in Latin America, with the maintenance and collection of samples under the jurisdiction of the respective Governments and the analytical work on the samples carried out at a central point. Over the first few years, the analytical sampling will be limited to the more basic indicators of pollution. This surveillance network should provide valuable data on which to base such future control programs as might be considered essential or desirable by the Governments.

With respect to water pollution, the Organization proposes to broaden its assistance program in 1966. Actions will include a series of consultant missions to Latin America to appraise status and trends of water pollution in segments of major river basins. To the extent of its resources, the Organization will attempt to meet the more urgent requests of the Governments. The purpose of these appraisals will be to assist the Governments in establishing the necessary surveillance on water pollution, with special attention to the more complex health-related problems.

For both air and water pollution, the Organization proposes to establish a practical system for the collection and dissemination of technical information as a means of keeping the Governments apprised of research studies and investigations carried on within the Region and in other parts of the world. The Organization will also encourage, sponsor, and assist procedures to have air and water pollution integrated into the education and training programs under way throughout the Americas. In organizing the regional research program in environmental sanitation, the Organization will give appropriate attention to problems of air and water pollution that need special study. The primary objective of air and water pollution activities will be to assist the Governments in the sound appraisal of the problems; and in determining the status and trends of such pollution. The assistance program will also include studies on the effects of air and water pollution on the health and well-being of people; on agriculture and other industrial developments; and on uses and values of waters and land areas. Special attention will be given to the development of practical, reasonable, and effective corrective actions or remedial measures.

Facing the fact of urban growth and industrial expansion, special emphasis is needed on methods of air and water pollution control. Problems of such pollution are well known, as are present control practices. However, effective treatment of such waste is quite expensive - often taxing the economic and operational capacity of an area or a country. Accordingly, there is need for research and investigation to provide simple methods of control that will be within the administrative and financial reach of areas affected. It is proposed to give increasing attention to this problem area.

E. SUMMARY

1. In any area, the pattern of human diseases and infirmities reflect the response of man to his total environment. As in all industrialized areas, the physical environment in Latin America is undergoing rapid and profound change. Pertinent influences include population growth, rapid industrialization, increased urbanization, the speed of travel, the interminglings of people, and the advancing technological processes.

2. Increased air and water pollution and their effects on man's health and well-being are significant factors resulting from the rapid changes in the physical environment. Contamination of air and water resources is increasing not only in volume, but also in the complexity of contaminants. In the past, air and water pollution was considered largely in terms of microbiological contaminants. In the future, this vista must broaden to include air and water contaminants that have their source in microchemical substances.

3. Recognizing the significance of industrialization to economic progress, unduly restrictive regulatory controls should be avoided - with due consideration to the capacity of air and water resources to assimilate, within limits, reasonable amounts of polluting wastes. At the same time, the health and well-being of people require that contamination of air and water be kept within safe and reasonable limits. The immediate need, therefore, is to develop effective monitoring services and the scientific intelligence required to determine when and how to apply corrective actions and remedial measures. Where pollution controls are required, the procedures applied should be kept within the administrative and financial capacity of the Governments concerned.

4. The resources of PAHO are used, in response to requests from the Governments, to provide technical and consultant assistance on air and water pollution problems in specific areas. This assistance will continue and will be increased. In addition, the Organization is developing an air surveillance network of sampling stations in ten major cities in Latin America. As requested and required, this network will be extended. On water pollution, the Organization proposes to broaden its assistance program, including consultant missions, to appraise the status and trends of water pollution over wide segments of major rivers and estuary areas. Both air and water pollution will be given appropriate consideration in the Organization's assistance programs for education, training, and research.