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PLANNING OF METROPOLITAN AREAS AND NEW TOWNS

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I INTRODUCTION

1. Definition of Planning

Most of the countries of the world are faced with a myriad of problems associated with the rapid increase in population and the movement of people from rural areas to the cities. In the developing countries, these problems are particularly acute and are sources of serious concern to all governments. While the problems are similar in character from country to country, the scope and magnitude vary widely with respect to economic, cultural, governmental and technologic factors. It is generally acknowledged that solutions to these problems must be developed through the process of comprehensive planning taking into account the special circumstances, requirements and resources of each country, region and area.

Planning has been defined in numerous ways, usually reflecting the state of the art of planning at the time that the definition is formulated or to

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give special visibility to a portion of the planning process. During the United Nations Meeting of An Expert Group on Metropolitan Planning and Development, which was convened in Stockholm Sweden, in September 1961, planning was given a bimodal definition, namely that it is the development of "a model of an intended future situation", and at the same time it is "a programme of action" delineating implementation measures.[1] Another current definition is that planning is an evolutionary continuum that creates a product.[2] It is a process. The product of modern planning, as efficient as the planning activity may be, is an imperfect result which should be immediately revised, modified or amended to reflect the changes in conditions that have occurred while the plan was being developed. Fundamentally, planning deals with the selection of a course of action from alternate choices. The dynamics of the available alternatives are the bases for the requirement of continued revision of a plan.

2. Classification of Planning

Metropolitan and new town planning usually involve the following three basic elements, namely, (1) economic planning, (2) location planning, and (3) physical planning. Economic planning generally relates to the volume of production and the investment of money and involves a balancing of available economic resources so as to achieve the desired productivity goal with optimal use of the resources. Location planning is considered to be

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1. Ahlberg, C.F. Physical and economic planning in metropolitan planning. Statement prepared for United Nations Meeting of Expert Group on Metropolitan Planning and Development, Stockholm, Sweden, 14-30 September 1961.

2. Duhl, L.J. Environmental health: politics, planning and money. American Journal of Public Health, 58:232-237, 1968.

the grouping of various land-use activities and the assignment of those groups to specific areas or districts. Physical planning, or environmental design planning or land-use planning, is the process which indicates the use to which land shall be put. Metropolitan planning today is primarily a form of physical planning with the emphasis on urban development. On the other hand, new town planning usually embraces all three elements of planning.

Planning may be carried on at various levels of government from the national level to the regional, metropolitan urban, and neighbourhood levels. Frequently, national and regional planning are oriented primarily toward economic planning. Planning at these levels of government involves the efficient utilization of national and regional resources and the distribution of capital and human resources between the various types of public and private enterprises. It focuses on the development of new industrial, commercial and agrarian uses of land and the redevelopment of existing patterns of land utilization. Planning at metropolitan, urban and neighbourhood levels involves primarily location planning and physical planning. A basic goal of a metropolitan planner is to assist in determining the rate and direction of flow of people, goods, and services to and from selected urban centres and to obtain an economic balance between the urban centre and the rural and suburban fringes. At the urban planning level, the usual goal is to separate simultaneously interrelated functions of the city by means of land-use planning as to create a harmony of elements - residential, industrial, commercial and institutional; to coordinate traffic planning; and to redevelop and guide new areas of urban development. The fundamental goal of neighbourhood planning is to redevelop and renew aged or inadequate sectors of an urban environment.

II PHASES OF THE PLANNING PROCESS

1. General

The planning process has at least three distinct phases of development plus an implementation phase. No plan can have much change of success unless it passes through the three development phases. These phases are:

- determination of goals and objectives
- data collection and research
- plan preparation and programming

These are distinct activities and must be performed sequentially.

1.1 Determination of Goals and Objectives

Since the planning process may be viewed as a series of related actions and decisions that are organized around and moving toward the accomplishment of goals and objectives, it is imperative that an initial phase of planning be the definition of the goals and objectives to be achieved. To many persons, the goals and objectives are viewed as the cornerstone of the planning process, since, in theory, they form the framework for much public and private decision-making.

When expressed in general terms of planning for metropolitan areas and new towns, most goals and objectives will be similar in nature and will usually address themselves to the issues for the creation of conditions conducive to better living, preparation for population increases, and orderly growth. Also, the general goals and objectives will usually involve some fundamental environmental and sociological issues that are common to the desires of most of mankind, namely,

livability, safety, sanitation and quiet.[3]

A traditional approach to metropolitan and town planning has been to view the metropolitan area or the town as a large design project.[4] The community is conceived as having a spatial, plastic form that can be grasped and reduced to manipulation and presentation by graphic means. According to this view, planning is a process of forming a picture of a future physical pattern and developing the control measures that are needed to move the community toward that end. The objective is to make the community look like a map of the future, and the goals, sometimes stated but often only implicit on maps, are convenience, order, efficiency, economy and beauty.

One method of determining goals and objectives in metropolitan area and new town planning is the use of the policies planning procedure. Policies are formulated, adopted and implemented by governmental administrators responsible for carrying out a particular programme. Policies are embodied often in implementing ordinances and some action programmes. Often these policies are formulated in response to a specific issue or a crisis situation and are not part of the formulation of an overall determination that establishes the framework capable of anticipating change and guiding decisions toward the provision of community needs.

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3. Clare, W.H. Introduction to Urban Planning Guide, American Society of Civil Engineers, New York, 1969.

4. Beal, F.H. Defining development objectives in Principles and Practices of Urban Planning. International City Managers' Association, Washington, D.C. 1968.

The goals and objectives of planning agencies of one level of government may have a profound influence in determining the goals and objectives of planning agencies of subordinate levels of government. In some cases, national planning goals are established which create the general framework for planning activities at all lesser levels of government. For example, in 1949 the Congress of the United States of America established a new national policy of "the elimination of substandard and other inadequate housing through the clearance of slums and blighted areas, and the realization as soon as feasible of the goal of a decent home and a suitable living environment for every american family"[5]. This set into motion the present programmes of urban renewal and development by state and municipal governments.

Similarly in the U.S.S.R., goals and objectives of regional, metropolitan and urban planning activities are determined in part by the national government.[6] The basic national planning law was enacted in 1933 and established the framework for the definition of planning goals and objectives. As an example of the U.S.S.R. approach to urban planning, it can be said that the master plan for Moscow was developed simultaneously, but dependent upon the scheme of regional planning for the Moscow Oblast which in turn had been developed from

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5. Housing Act of 1949. Public Law 171, 81st Congress, 1st Session, Chap. 338., Washington, D.C.

6. Perotskaya, A.S. Hygienic questions in planning residential areas in the U.S.S.R. and tasks of sanitary control. Working paper prepared for WHO Inter-regional Seminar on Health and Sanitation Aspects of Town Planning in the U.S.S.R., Central Institute for Advanced Medical Studies, USSR Ministry of Public Health, Moscow, 1968.

the national development plan.[7] One of the interesting features of Soviet urbanization is reflected in the planned system of national economy for the U.S.S.R., in which an organic link is provided between urbanization and national economic planning in development and distribution of the productive forces according to the available and potential economic resources of each region.

The development of general goals and objectives may be accomplished by the interaction of the following elements of society, (1) the citizenry usually acting collectively through civic organizations or voluntary agencies, (2) government expressing itself through elected officials and representatives or through appointed administrative officers and (3) business and industry. However, goals and objectives when formulated by these means should be reviewed and evaluated carefully to minimize the potential influence of selfish motives, particularly those that may have generated by business and industrial elements.

In any discussion of who determines the goals and objectives of a planning endeavour and of the mechanisms used, the roles of the professional planner and of planning agencies are usually raised. While their responsibilities and functions vary from situation to situation, it is generally agreed that they do not have the final word, but do have several important parts to play. It has been said that

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7. Mishchenko, G. Planning and building cities in the U.S.S.R. Working paper prepared for WHO Inter-regional Seminar on Health and Sanitation Aspects of Town Planning in the U.S.S.R., Central Institute for Advanced Medical Studies, USSR Ministry of Public Health, Moscow, 1968.

one of the principal functions to be performed by a professional planner is to serve as an adviser to politically responsible governmental officials. This role clearly supports the contention that planning is an advisory function only, and that implementation and other courses of action are the responsibility and function of others.

1.2 Data Collection and Research

In the development of plans for metropolitan areas and new towns, it is necessary that a certain amount of data be collected, analyzed and interpreted. The scope of these data collection activities and research studies will vary depending upon the defined goals and objectives, however, the analysis and projections of population growth, of economic development and of land-use patterns are at the base of almost all major planning decisions.

1.2.1. Population Projections

Since planning is for the benefit of both present and future populations, it is important to relate all planning activities to population data. Of major importance are the number of persons, where they will be located, and the basic demographic characteristics of various population groups. The amount and distribution of future populations exert a strong influence on the proposed location and extent of land use areas and on the scale and location of physical facilities such as schools, hospitals, parks, water supply systems, sanitary sewers, etc. An accurate analysis of the demography of the present population and a realistic forecast of anticipated populations are necessary for the planning of

the number and types of housing units, schools, medical care facilities, recreational units, etc., to be provided.

Sanitary engineers have some expertise in forecasting population growth as these projections have been and are essential in the design of water supply and waste water systems. However, some of the methods used in the past by engineers and others are not acceptable for use in planning procedures today. Accurate population forecast must be based upon present and expected fertility and mortality rates and on immigration and emigration patters. Knowledge of growth trends of the past are not of great importance today in forecasting future populations as the characteristics that influenced population size in the past are not of the same scope or magnitude as those that are determining the number of persons living in an area today and that will do so in the future.

Many errors of planning of the past have stemmed from insufficient thought and effort in conducting population studies. Frequently, quick and overly simplistic population projections were used resulting in overdesigned or underdesigned projects. Another source of error in planning activities has been the failure to recheck population projections prepared as a first step in the planning process and a reanalysis of the assumptions upon which these projections were based with the findings from other kinds of studies conducted and analyzed as a part of the total planning process and with the final decisions and recommendations.

1.2.2. Forecasts of Economic Development

Metropolitan areas thrive and grow, and new towns survive and develop largely because of economic, cultural and social advantages afforded the residents. Usually this is because opportunities have been provided for regular and gainful employment, but sometimes as is the case of suburban communities and satellite towns, it is because of the provision of a desirable residential character or a healthful and satisfying environment. In most of these latter cases, there is usually a city nearby which establishes or provides the economic base for the regions.

In the planning process, careful analysis and interpretation should be given to data concerning trends and characteristics of the labour force, major sources of employment, available transportation facilities to move raw goods and finished materials, natural resources such as fuels, minerals, water, etc., location of markets for finished goods, and natural conditions such as climate. Another factor that determines in part, the economy of an area, is taxation practices and patterns. This, also, merits close scrutiny in planning activities.

In addition to analyses of trends and current status of the factors listed above, planning activities should include special attention to the probable number of employees according to major types of employment. The amount and type of potential employment will influence considerably other phases of the planning; e.g., the amount of employment will directly affect the probable future population and the type of employment will

influence future patterns of land-use. In planning for substantial increases in industrial employment, adequate land and resources must be available for the industrial development and sufficient and adequate housing must be available for the labour force.

1.2.3. Land-Use Studies

Important elements of data collection and analysis for the planning of metropolitan areas and new towns are land-use studies. The purpose of such studies are to anticipate urban growth and thereby prevent the creation of some serious problems. Land-use studies usually are designed to provide basic data on land characteristics and the various activities that occupy land within the planning area. Land-use plans that evolve from these studies establish the character, quality and pattern of the physical environment for the activities of people and organizations within the metropolitan area or new town.

Land-use studies involve the collection and analysis of data concerning the use, nonuse, and misuse of land within the planning area. Chapin lists nine sectors that may be included in an urban land-use study as follows:

i compilation of data on physiographic features that map the urban setting

ii land-use survey

iii vacant land survey

iv hydrological and flood potential study

v structural and environmental quality survey

vi cost-revenue studies of land use

vii land value studies

viii studies of aesthetic features of urban land

ix studies of public

While this list applies primarily to existing urban areas, it may be modified to fit the needs for the planning and developing of land-use schemes for new towns.

In conducting land-use studies, it is necessary to develop and adopt a land-use classification system. There is no model or prescribed system suitable for all communities. However, there are some broad categories of land-use that prevail in most classification systems. Illustrative of major urban land-use categories is the following:

i Residential

(a) low density

(b) medium density

(c) high density

ii Retail business

(a) local business uses

(b) central business uses

(c) regional shopping centres

(d) highway services

iii Transportation, utilities and communications

iv Industry and related uses

(a) extensive

(b) intermediate

(c) intensive

v Wholesale and related uses

vi Public buildings and open areas

vii Institutional buildings and areas

viii Vacant or nonurban uses.[8]

The results of land-use studies are usually recorded on maps. If accurate maps are not available, recent aerial photographs may be used. The intent is to create a visual picture of the land-use pattern as an aid to analysis.

1.2.4. Transportation and Circulation Studies

In the planning for transportation and circulation facilities and services of metropolitan areas and new towns, emphasis should be placed on the total transportation system rather than on one or more isolated facilities of the system. A basic goal of planning is the provision of transportation facilities and services that will ensure safety for both the traveller and the pedestrian as well as the rapid, efficient and reliable movement of people and goods.

Urban transportation patterns have changed markedly over the past few decades in almost all cities everywhere, regardless of location. Similar changes may be expected in the subsequent decades. Studies of transportation facilities and services as a part of the planning process should have sufficient breadth and depth as to provide a comprehensive understanding of the

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8. Chapin, F.S., Jr. Urban Land-Use Planning. University of Illinois Press, Urbana, 2nd ed., 1965.

nature and characteristics of travel of people within urban areas and of the movement of goods and commodities.

Transportation and circulation studies may be conducted in many ways. For example, travel data of both people and goods may be collected by origin-destination surveys. Or, they may be gathered on a mode of travel basis. A preferred way is to consider an urban transportation system as three basic inter-related systems. The first sub-system concerns the travel way. Circulation takes place over permanent pathways, namely streets and rights-of-way. In urban communities these permanent pathways occupy up to 30 percent of the total land area, influence the shape of blocks and plots of land, and may help fix the boundaries of residential communities and other major land-uses. The second sub-system concerns the transportation vehicle. Many different devices are used in moving people and goods. Horse-drawn vehicles, bicycles, automobiles, trucks, buses and rapid transit cars are different types of transportation venicles. Each type of vehicle has its function and efficiency in transporting persons or cargo. The third sub-system involves the terminal facilities. A terminal may be defined as any facility providing for the delivery, receipt, and temporary storage of goods or the embarkation of passengers. A terminal may also provide for the temporary storage of the vehicle itself. Hence, an off-street parking garages or lots are forms of terminal facilities.

In the planning of metropolitan areas and new towns, it is imperative that the transportation system be viewed as the

circulatory system of the city. It brings people and goods into and from the community and provides the means by which people can move freely from place to place.

1.2.5. Other Studies

There are other studies that may be conducted as elements of data collection and research. Included are housing studies which usually include appraisal of the quality and enumeration of the quantity of housing resources; community facilities studies which focus on the relationship of schools, playgrounds, parks, firehouses, police stations, etc. to present and prospective population distributions; utilities studies which deal with the capacity and location of lines for carrying water, waste water, storm water drainage, gas, electricity and power; land development studies which examine and map such physiographic and economic characteristics of land significant to its potential for metropolitan development and community expansion as topography, soil types, vegetation, sub-surface conditions, patterns of land values and property ownership; and implementation studies which analyze the municipal debt structure for capital funding purposes and the existing regulatory instruments such as statutes, ordinances, regulations, etc.[9]

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9. Fagin, H., Planning for future urban growth. Law and Contemporary Problems, 30:9-25, (Winter) 1965.

1.3 Plan Preparation and Programming

While there is much latitude to the urban planning process and to the means by which a plan is developed, there are six basic requirements which the plan document should fulfil.[10] These are:

i The plan should be comprehensive.

ii The plan should be long-range.

iii The plan should be general.

iv The plan should focus on physical development.

v The plan should relate physical design proposals to community goals and social economic policies.

vi The plan should be first a policy instrument, only second a technical instrument.

The plan document usually is divided into two major sub-sections. The first section usually contains the basic policies for orderly urban growth and development. The second section contains the proposed general physical design. In the basic policies section, there is usually a review of the historical background of the area and a summary of the geographical and physical factors. In this section, major issues, problems and opportunities for growth and development are frequently identified. Data are presented concerning social, economic and demographic factors. A major portion of the basic policies section of the general urban plan deals with the social objectives and the urban physical-structure concepts. Value

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10. Black, A. The comprehensive plan in Principles and Practices of Urban Planning, Goodman, W.I., and Freund, E.C., editors. International City Managers' Association, Washington, D.C., 1968.

judgements concerning social goals are presented as well as professional judgements pertaining to major physical-structure concepts. The heart of the basic policies section is the indentification of all of the basic policies upon which the plan is based. Supportive information about the policies is presented, analyzed and discussed as well as possible means of implementing the policies through physical design.

The second section is often a description of the physical design proposals together with maps, drawings, etc. Often this section is sub-divided into segments such as the land-use plan, the thoroughfare and transportation plan, the community facilities plan, and the utilities and public improvement plan.

In order to maintain comprehensiveness, the general urban plan should be in a single published document and include large drawings showing the general physical design proposed for the metropolitan area or new town, the written text and whatever maps, illustrations, charts and tables needed to support the text. The document should be designed so that it is attractive and should be written so that it is both understandable and interesting to read.

1.3.1. Programming Urban Development

There are many programming techniques that may be used in urban development. However, of basic importance is the fact that the purpose of planning is to influence people. Plans are made by people to be implemented by people. Therefore, an important element of programming involves communication and the establishment of effective working relationships within the

governmental structure and between the public and private sectors of the community.

In many urban areas, programming and implementation of urban development plans have been accomplished by the cultivation of citizen support for the proposals. In many instances, planning and housing councils, independent of the government, have been organized and have become functional on a metropolitan basis. Such groups are often effective in stimulating popular interest in and support for the official planning programme. They are able to identify the needs of the citizenry to government officials and to relate the proposals of the municipal planning agency to the people.

Urban plans have been implemented in many cities by use of a variety of incentives and inducements. These have ranged from simple tax concessions, to loans and guarantees, to outright cash grants for developments which meet certain requirements related to the objectives of the government. In some cases these incentives and inducements are financed by the local government, but more often they are by the state or national government.

Some planning objectives may be achieved by the enactment of regulations and other legal controls by the municipal government. Of primary importance are zoning regulations and sub-division regulations. These regulations are based on the authority vested in the governmental unit to preserve and protect the public health, the public safety and the public

morals. Municipal governments usually have a variety of other regulations which may affect the standards of development or the location of particular types of facilities. These include public health regulations, building codes, and housing codes.

A planning agency cannot guide, influence or advise on matters about which it is unfamiliar. Therefore, in order to assume that the planning agency will be kept informed about development matters, many municipalities, through a variety of legal devices, require a routine review by the planning agency of proposals that would affect significantly the growth, development or change of the urban area.

In implementing a plan for orderly growth and development of a metropolitan area or a new town, resourcefulness is of paramount importance. There is no "book method" that will ensure successful programming and implementation of an urban plan. Each situation is unique unto itself. Those persons responsible for the programming and implementation of plans for metropolitan development must be cognizant of the needs and the desires of residents of that area and knowledgeable of available means to achieve the planning objectives.

III PLANNING FOR ENVIRONMENTAL HEALTH OBJECTIVES

1. Basic Considerations

In 1961 in Stockholm, the United Nations convened a group of experts on metropolitan planning and development. In their deliberations these experts recommended that governments give consideration to several important

issues relating to the public health aspects of metropolitan planning and development including the following:

"(a) National health policy should give special attention to the problems created by metropolitan growth with its overcrowding, poor housing and poor sanitary conditions, deficient nutrition and high physical and mental strain on a large percentage of the population;

(b) Participation of health administrators and technicians in physical and general planning for urban and metropolitan areas from the earliest stages of such planning;

(c) Adequate representation of the health administration in the department or ministry in charge of planning and development policies for the metropolitan area, in order to include health and sanitation specialists in planning and development boards;

(d) ....."[11]

These recomendations indirectly acknowledge the need to incorporate environmental health considerations in all phases of comprehensive planning of metropolitan areas and of new towns.

In June 1971, WHO convened in Geneva a Scientific Group to discuss the development of environmental health criteria for urban planning. This group identified two major goals of environmental health in urban planning, namely 1) the elimination or modification of present environmental hazards to the health and social well-being of urban residents, and 2) the efficient management of environmental resources of an urban area in such a

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11. United Nations. Planning of Metropolitan Areas and New Towns. ST/SOA/65, 1965.

manner as to promote or enhance health and social well-being of the people who reside in the urban area.[12] The first objective is applicable only to urban planning of existing metropolitan areas, but the second applies to the planning of new towns as well as of existing urban areas.

The Scientific Group defined six specific objectives of environmental health which the Group believed should be among the goals of most urban planning programmes. The six objectives are:

Objective 1 Prevention and control of transmission of infectious agents.

Objective 2 Prevention and control of human exposure to chemicals that are or may be hazardous to human health.

Objective 3 Prevention and control of human exposure to physical forces and agents that are or may be hazardous to human health.

Objective 4 Prevention and control of those biological, chemical or physical conditions, forces and agents that cause or may cause anxiety.

Objective 5 Promotion or enhancement of physical well-being.

Objective 6 Promotion or enhancement of social well-being.

The first objective has been identified and accepted as a goal of environmental sanitation programmes for many years. Some environmental health programmes have been geared to the achievement of portions of Objectives 2, 3 and 4, but very few have included Objectives 5 and 6 in the schedule of planned activities. However, modern practice of urban planning should include all.

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12. World Health Organization, Development of Environmental Health Criteria for Urban Planning, Report of a WHO Scientific Group, Geneva, June 1971, (mimeo)

In November 1970, WHO convened a meeting in Geneva on Health Effects of Urbanization. The participants of that meeting noted that there were at least six major problems of the physical environment of most areas, for which there was particular health concern. They are:

"i the proper disposal of wastes,

ii the assurance of supplies of bacteriologically and chemically safe food and water,

iii air pollution;

iv problems associated with traffic accidents, congestion and resultant stress, noise, etc.;

v problems associated with space - overcrowding, lack of access to service, recreational, or work facilities, etc.

vi problems associated with specific urban micro-environments, e.g. lack of sunlight, greenery, poor ventilation, dilapidated or unsafe dwellings, etc." [13]

This list is important because it enumerates some of the more important areas of the environment meriting special concern by urban planners.

2. Specific Environmental Issues in Planning

The WHO Expert Committee on Environmental Health Aspects of Metropolitan Planning and Development, which met in 1964, listed ten environmental issues that require special attention in metropolitan planning.[14] These issues are:

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13. World Health Organization. Health Effects of Urbanization, Report of a WHO Meeting, Geneva, November 1970, (mimeo)

14. World Health Organization. Environmental Health Aspects of Metropolitan Planning and Development, Report of a WHO Expert Committee. WHO Technical Report Series No.297, Geneva, 1965.

i water supply

ii sanitary waste disposal (waste water and human excreta)

iii drainage of storm water

iv solid wastes and land pollution

v air pollution

vi ionizing radiation

vii housing and open spaces

viii public health establishments (hospitals, clinics, etc.)

ix vector control

x noise and vibration

The WHO Expert Committee on the Planning, Organization and Administration of National Environmental Health Programmes, which met in Geneva in June 1969, added two additional environmental health issues that they felt must be considered in planning, namely food control and occupational hazards.[15]

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15. World Health Organization. National Environmental Health Programmes: Their Planning, Organization and Administration Report of a WHO Expert Committee. WHO Technical Report Series No. 439, Geneva, 1970

IV SUMMARY

Planning is a process by which available data, needs and resources are appraised and analyzed, and used in preparation for change.[14] There are many types of planning operations and several levels of planning. All planning operations involve at least three phases, namely, determination of goals and objectives; data collection and research; and plan preparation and programming. There is a critical need to integrate environmental health activities into the planning process of metropolitan areas and new towns.

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14. World Health Organization. Environmental Health Aspects of Metropolitan Planning and Development, Report of a WHO Expert Committee. WHO Technical Report Series No.297, Geneva, 1965.

ENVIRONMENTAL HEALTH CRITERIA FOR URBAN PLANNING*

Many expert committees and several scientific groups that have been convened by WHO have proposed or promulgated environmental health criteria for urban planning. Some of the more pertinent criteria are presented herewith in a summarized form.

The report of Expert Committee on Environmental Health Aspects of Metropolitan Planning and Development included many generalized environmental health criteria for use in urban planning.[1] These criteria were not listed explicitly as such, but the Scientific Group on the Development of Environmental Health Criteria for Urban Planning reviewed and studied this material and summarized it as follows:

1. Criteria for Urban Water Supply

   a) Urban water supplies should be continuous, adequate and safe, and should have sufficient pressure.

   b) Urban water supplies should meet at least the standards specified in the current edition of the International Standards for Drinking Water[1] recommended by WHO.

   c) Adequate supplies of potable and palatable water should be provided for the domestic use of every inhabitant of the urban area.

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* The material in this Annex has been abstracted from the Report of the meeting of the WHO Scientific Group on the Development of Environmental Health Criteria for Urban Planning, 1 - 9 June 1971, Geneva.

1. Wld. Hlth. Org. Techn. Rep. Ser., 1965, 297, pp. 29-52.

d) Sufficient water with adequate pressure should be made available for fire services.

2. Criteria for Waste Water Systems

a) Sewerage systems, sewage treatment facilities and adequate storm water drainage should be provided in urban areas.

b) Sewage treatment facilities should be adequate to permit subsequent uses of receiving bodies of water.

c) Adequate drainage of storm water should be provided in urban areas as to prevent localized flooding.

3. Criteria for Urban-Area Water Resources

a) Water supply, sewerage and drainage should be considered as a unit or as a system and their coordinated planning as an integral part of the metropolitan plan.

b) Water supply, sewerage, sewage treatment and, where possible, drainage should be considered as a public utility and financed on a self-liquidating basis.

4. Criteria for Solid Wastes Management

a) The storage, collection, transport and disposal of solid wastes should be considered as units of a system, each interrelated to the other.

b) The storage, collection and transport of solid wastes, particularly garbage, should be done in the most sanitary and efficiency way possible to assure proper control of infectious diseases.

c) The collection and transport of solid wastes should not cause traffic congestion or create a nuisance situation.

5. Criteria Concerning Land Pollution

a) Seepage into, or discharge on the earth surface of chemicals, including oil should not pollute the soil or the ground water table.

b) Excavation for sand and gravel and spoil banks from mining operations should not create breeding areas for insects and rodents, nor nuisance conditions, and should not interfere unduly or seriously limit future land use of the site.

c) Discharge of radioactive materials on the earth surface or burial of these materials in the earth's surface should not create potential hazards to present and future generations of humans, plants or animals.

d) Land conservation practices should be developed in cooperation with soil conservation groups and these practices should be made an integral part of the urban plan for solid waste disposal.

6. Criteria for Air Pollution Control

a) The siting of new towns should be undertaken only after a thorough study of local topography and meteorology.

b) New industries using materials or processes likely to produce air contaminants should be so located as to minimize the effects of air pollution in the population.

c) Satellite (dormitory) towns should be restricted in use of pollution-producing fuels.

d) Provision should be made for the development and maintenance of green belts and open spaces to facilitate the dilution and dispersion of unavoidable air pollution.

e) Greater use should be made of hydro-electric and nuclear energy and of natural gas for industrial processes and domestic purposes as a means of reducing the pollution resulting from the use of conventional fossil fuels.

f) Greater use should be made of central plants for the provision of both heat and hot water for entire districts.

g) As motor transport is a major source of pollution, traffic should be planned as to reduce the level of pollution from motor powered vehicles in residential areas.

7. Criteria for the Use of Ionizing Radiation

a) If nuclear reactors are to be used for the generation of electric energy of an urban area, the location of such reactors should be planned so that radiation hazards to the population experienced through the accidental release of radioactive wastes into the air, water and ground will be at an absolute minimum.

b) Nuclear reactors not used for power production and facilities for the processing of radioactive substances should be located in remote areas with low population densities.

8. Criteria for Housing and Open Space

a) Residential areas should be protected against all sources of pollution - air, water and soil.

b) Conditions in residential areas should not interfere with the provision of sunshine and natural ventilation.

c) Protection should be afforded against noise.

d) Roads and streets in residential areas should be designed to minimize accidental injury to the residents of the areas.

e) Residential areas should be designed as to eliminate undesirable segregation of individuals, families and groups of families.

f) Residential areas should be planned with ample provision of open spaces for recreation and relaxation and as to be easily accessible.

g) Open spaces should be provided for passive activities.

h) In residential areas, or in areas easily accessible from residential areas, provision should be made for schools, crèches, hospitals and health care facilities.

9. Criteria for Public Health Establishments

a) Establishments intended to meet the routine medicine needs of a population should be located as to serve residential areas.

10. Criteria for Vector Control

a) Provision should be made to eliminate and to prevent the creation of breeding areas and harbourages of biological vectors of human disease or to provide effective barriers and control measures to prevent the transmission of infectious agents to humans.

11. Criteria for Noise and Vibration

a) Noisy industrial establishments, airports, landing fields for helicopters, railway stations and junctions and superhighways should be located outside the city limits.

b) Planning should make provision for the surfacing of highways and urban streets with materials that will prevent or reduce noise from vehicles travelling on the highways and streets.

c) Green belts or open spaces should be planted with trees and shrubbery particularly if the green belt or open spaces is between a residential area and a source of noise, since vegetation has some sound absorbing capacity.

Environmental health criteria for urban planning have been included in the reports of several other expert committees. In the Report of the Expert Committee on the Public Health Aspects of Housing, which met in 1961, a series of criteria are listed under the heading of "Public health requirements in town, village and regional planning".[1] These criteria are similar to some of those that have been reported herewith. The scope of these criteria includes water supply; waste water handling and disposal; storm water drainage; design and location of highways, roads and footpaths; air pollution, community facilities; safety; and health care facilities.

When the Expert Committee on the Appraisal of Hygienic Quality of Housing and its Environment submitted their report, they included by an indirect means a series of environmental health criteria for urban planning.[2] By including in an Annex a list of environmental items that should be evaluated in making an appraisal of the hygienic qualities of the residential

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1. Wld. Hlth. Org. Techn. Rep. Ser., 1961, 225, pp. 37-39.

2. Wld. Hlth. Org. Techn. Rep. Ser., 1967, 353, pp. 47-50.

environment, this committee has developed a partial list of environmental health criteria that should be fundamental in all urban planning activities. These criteria are those that should be considered as constituting minimal conditions for meeting some of the basic health goals.

The Scientific Group on the Treatment and Disposal of Wastes that met in December 1966, included two very important environmental health criteria for urban planning in their report.[1] The first criteria they formulated is as follows:

"Wastes should not be transferred from one part of the environment to another without adequate study of their effect on the environment as a whole."

The second criteria is as follows (paraphrased):

Open dumping or tipping of solid wastes should not be used as a method for the disposal of these wastes.

Three very important environmental health criteria for urban planning were among the findings of the Expert Committee on Water Pollution Control in Developing Countries.[2] The first criterion dealt with industrial wastes and is as follows:

"If an industrial waste is unacceptable in its original state (i.e. may endanger men working in the sewerage system; may damage the sewerage system or interfere with its maintenance; interfere unduly with the treatment process; or cause a serious deterioration in the

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1. Wld. Hlth. Org. Techn. Rep. Ser., 1967, 367, pp. 10, 14

2. Wld. Hlth. Org. Techn. Rep. Ser., 1968, 404, pp. 23, 25, 26

quality of the sewage effluent) it should be pretreated to correct the condition before discharge into the sewerage system".

The second criterion (restated) is as follows:

If sewage irrigation is used as a means of disposal of liquid waste. special provision should be provided in order that strict control may be exercised of the method in order that human health may be safeguarded.

This Expert Committee promulgated a third criterion which deals with sludge disposal. This criterion, in a restated form, is as follows:

If sewage sludge is to be used as source of organic matter for the improvement of soil, the biological and chemical characteristics of the sludge should be determined carefully and the results interpreted critically to prevent the creation of a hazard to health.