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HUMAN SETTLEMENTS AND HEALTH

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prepared by:

M.A. Hassouna
With Contributions by
WHO/ HQ Staff Geneva.

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CAIRO
SALAH SALEM SL-NASR CITY

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1. INTRODUCTION

1.1 Human settlements

The complexity of the topic health and human settlements is such that in order to consider the various interactions and implications involved it is necessary to construct a central theme around which the various different approaches to solving many of the related problems can be brought together in an integrated, comprehensive way.

One of the more focal issues around which health problems have been observed to revolve is the imbalance that exists or which often develops, between population and the organizational, technological, human and monetary resources that are involved in improving the quality of life of that population. It is through these two fundamental forces that help shape the nature of human settlements that this paper will consider the problem of health and habitat.

Throughout the world recent history has been characterised by an increasing disparity between population growth and the development and utilisation of the resources required to meet the different needs of those populations. Internal and externally oriented migration has been one of the more manifest results of such disparities while in turn, movement of large groups of people from one area to another has had inevitable health and social consequences.

Traditionally the rate of population growth in most societies has been slightly above replacement level. With declining mortality rates, however, this growth in population has accelerated. This has been particularly so in economically less prosperous countries where growth rates of 2½ to 3% have been observed. In more developed countries, on the other hand, population growth has been of a significantly lower order suggesting that an almost inverse relationship may exist between population and resource growth.

1.1.1 Migration

Migration has evolved as one of the alternative courses of action that man has used to meet this dilemma and improve his living conditions. In most such endeavours he has succeeded but in others migration has had a variety of negative implications for both the migrant and the human settlement to which he migrated. Where social and economic barriers have limited integration within host communities, squatter settlements and shanty towns have mushroomed. Decaying parts of cities have been given over to economically and socially depressed groups and slum settlements have often developed within the framework of existing communities. In large cities this has in turn been associated with further outward movement of upper and middle class groups to settle in suburban centres away from the congested and deteriorated city. Where they have tended to become economically and socially self-contained, their relationship to the city has become purely occupational.

Thus, in cases where population movement to other settlements is not associated with economic and social mobility,[1] existing settlements are liable to suffer while the benefits to the incoming migrant remain doubtful e.g., migration from villages to cities in developing countries.

Where population movement is associated with economic and social mobility, on the other hand, there can be mutual benefits for both the migrant and the settlement to which he moves.

1.1.2 Moving groups

Similar problems have been associated with what will here be termed "moving groups" (tourists, national and international seasonal workers, pilgrims, nomads, etc.).

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1) In economic terms mobility means the movement from less to more attractive jobs or employment

Developments in mass transportation have not only accelerated the movement of many such groups but have also made temporary movement a possibility for larger proportions of the world population than ever before. Aside from the economic, social and political significance of this, the implicatios for health of such a phenomenon are broad.

1.1.3 New settlements

Development of new settlement communities associated with the exploitation of resources also calls for consideration from health planners. Usually planned in advance they are of special interest because:

(1) They represent a spearhead for the planning and design of the settlements of the future;

(2) They provide the health sector with a unique opportunity for better planning and management of health delivery systems as an integral part of an overall development strategy.

1.1.4 Displaced groups

Settlements for displaced persons and groups result from dramatic changes in the natural or socio-political environment; floods, famine and wars bring about acute needs and produce quite specific health problems. Over the long term, however, these needs and conditions may be less problematical than those that are experienced by settlements generated through the displacement of population groups for developmental purposes.

1.2 Health implications of human settlements

1.2.1 A typology of human settlements

Any discussion of the health implications of human settlements will be shaped by the way we view human settlements. The view that human settlements are simply a variety of population numbers living on various sizes of settlements inevitably leads to an over-simplified approach that perceives health problems of human settlements as essentially problems of density and crowding. Solution by those who follow this approach will be sought in the search for optimal numbers of people to services. Likewise the provision and location of health services will follow similar principles in order to maximize the utilization of services through the purely economic tools of staffing/population ratio and optimal location.

The above view completely ignores the essential role of human values both at individual and societal levels. The main emphasis is directed towards the perfection of physical aspects of human settlements based on the fallacious assumption that desired behavioural changes will certainly follow. It has been proven beyond doubt that such an approach is insufficient, and that a comprehensive view of human settlements which incorporates physical, social, cultural and political factors which influence human values and behaviour, is much more realistic in understanding and solving the problems of human settlements.

In a comprehensive approach, health implications of human settlements are viewed as reflections of the process of man's adaptation to the many elements that make up his physical and/or social environment. And since human settlements in this approach are viewed as variations of resource/population mixes, it is possible to conceptualize health

implications of human settlements as varying both between and within different types of settlement. In order to expand upon this approach and to examine the health implications and the role of health services in human settlements, a typology has been constructed.

This typology was developed on the basis of of a number of settlement criteria and given an analysis of the resettlement process. The desirability of a dynamic approach in looking at this problem is emphasized. It classifies human settlements into the following six main groups:

(1) Settlements which result from rural-to-urban migration;
(2) Traditional villages;
(3) Existing cities (traditional)
(4) Human settlements which result from government or private sector development efforts;
(5) Settlements for moving groups;
(6) Settlements for displaced persons and groups.

1.2.2 The present health situation in human settlements

Little is known about the relationship between health status and the different physical and social characteristics of various types of human settlements throughout the world. Some case studies and analyses related to this subject are available but on the whole the data are not crossculturally comparable and it is difficult to establish general principles concerning the relationship of health status to physical and social environement.

The problems of environmental health - water supply, waste disposal, other qualities of housing, vector control, soil, air and water pollution, food hygiene, radiation control, occupational health are almost invariably associated

with specific types of human settlements. And, in turn, crowding, inadequate personal hygiene, poor housing, poor nutrition and lack of education are known to be associated with the high morbidity and infant mortality that occur in certain types of human settlements.

Because of their typically poor living conditions, low incomes, poor access to services and knowledge about health care facilities in the particular setting in which they find themselves, migrant communities too are often at high risk of communicable diseases, presenting a problem not only for the group itself but also the host society in which they are located. Problems of mental health have also been observed to be related to migrant groups, suggesting that the stresses involved in family disruption and cultural dislocation may go on to generate specific mental health conditions.

Large numbers of people in small spaces predispose to epidemics of infectious disease. Psychosomatic and social problems such as juvenile delinquency and drug taking have similarly been observed in some such settings. This however is not necessarily universal. Some cultures have solved such problems more effectively than others while in yet other cases problems of this nature may simply not have arisen.

Rapidly changing social conditions have been the cause of problems in certain parts of the world. Influx of foreign migrants with different concepts of social values, technological developments such as television which alter leisure patterns, or the increased use of motorized transport, which, while increasing mobility, may tend to break up family groups, are all examples of the way in which change may affect health.

Economic factors too have an important effect on health. Poverty leads to malnutrition, communicable disease, and high

rates of infant, child and general mortality. It may also predispose to fatigue, frustration and distress. Affluence, on the other hand, appears to be more closely associated with chronic diseases such as heart problems, alcoholism, depression and suicide. Again, the effects of both poverty and affluence can be largely mitigated by cultural patterns, which provide both challenge and hope to the populace.

Social isolation, resulting from the loss of family and friends, can be an important factor in the development of many depressive conditions while making groups susceptible to certain communicable diseases. The epidemics that spread among eskimo populations when they were first exposed to visitors from the outside world are typical of this.

It is important too, to note that social institutions are changing rapidly in concert with population trends. The family, at one time largely responsible for taking care of both the physically as well as the mentally ill, has tended to be broken up by industrialization and urbanization, leaving a gap in health care which is not being adequately replaced by alternative institutions.

Culture inevitabley plays an important role in health, determining the way in which people perceive their environment and their quality of life. It is characterized by customs and beliefs which in turn influence sanitary habits, personal hygiene, diet, the preparation of food, type of housing, and need for privacy, etc. The potential role of the community itself, in taking care of the chronically sick and the aged is enormous. Unfortunately, rapid social changes lead to changes in cultural and traditional approaches that were once used to deal with problems. These traditional solutions are disappearing and are not being replaced by new ones.

1.3 The role of health services in human settlements

1.3.1 Comprehensive approach

Based on the view that health implications of human settlements are reflections of the process of adaptation and adjustment to the physical and social environment, health services in human settlements should be designed to enable man to achieve a better level of adaptation and adjustment. This requires a more comprehensive approach to health than the limited disease-oriented role which has prevailed previously. A new orientation and fundamental changes in attitudes of health workers, their training and the planning and the planning and delivery of health services are thus necessary.

1.3.2 Reducing resource/population imbalances

Following the basic hypothesis that resource/population imbalances are the fundamental cause of the present deterioration in quality of life and health status in human settlements, any overall approach to improve these conditions should first aim at removing such disequilibrium. Health action can only be meaningful if it becomes an integral part of an overall strategy, policy and plan to deal with the problems of human settlements. This requires an understanding of how health considerations can be aligned with the values of other sectors associated with development.

In this report an attempt is made to demonstrate the role of health in improving resource population imbalances through resource and population activities. Three basis resource activities are mentioned, i.e.:

(1) Improving utilization and maintenance of available resources;
(2) Exploiting unutilized potential resources ; and
(3) Seeking new resources.

On the population side, health action to improve imbalances is delineated in three areas:

(1) manpower development;
(2) reducing disparities in living standards;
(3) popular participation.

1.3.3 Justification of health services

Lack of co-ordination and collaboration between sectors involved in development leads to the health sector being left with fewer resources than it needs. Characteristically the attitudes of governments towards health issues have centred on the allocation of resources required to deal with problems on a residual basis. The use of cost-benefit approaches may help justify some requests, but the application of rigorous economic analysis to many health activities is extremely difficult if even desirable. This difficulty contributes to the tendency to assign low priorities to the unmeasurable impacts of health in spite of their great significance for development. The argument of the productive role of health, for example, does not hold in many settlement situations where labour surplus, unemployment and underemployment obtain. On the other hand the argument for the educative role of health, which is extremely important in precisely these same settlement situations, is almost always ignored because it is not as easily subject to quantification and is hence accorded a lower priority.

1.3.4 Planning considerations

In considering these approaches, planners of health delivery services should take into account the fundamental differences that exist between physical, social, economic, and cultural aspects of various human settlements and the extent to which these differences influence the nature of health needs and the services that can meet them. All too often they have been ignored, and health service models have

been introduced irrespective of their pertinence to the needs of specific human settlements.

The utilization of health services is basically a function of their physical, social and economic accessibility. In many cases, however, social acceptability is the most important factor. Selection, training and assignment of health workers is thus crucial to successful utilization.

Contemporary health technology is such that in the case of many health problems people from the community can be trained to meet the level of competence required to perform most of the tasks. Empirical studies have consistently verified the fact that health workers are viewed as social change agents. Successful health workers dealing directly with the public should be of the same origin and background as their clients on all variables except technical competence in order to achieve acceptance among their clients.

Health services through community development is the approach that is singled out in this report as an advantageous means for integrating social action programmes.

The following features should be considered fundamental to health interventions in human settlements.

(1) environmental factors of a physical nature such as housing, water supply, sewage and solid waste disposal, pollution, occupational hazards, lack of recreational space, crowding, population density, location and climate

(2) environmental factors of a social nature such as disruption of family, isolation, oulture conflict, attitude of host or receiving settlement, socio-economic level of receiving settlement and of new settlers

(3) health delivery system factors such as efficiency, effectiveness, availability, accessibility and acceptability.

2. HUMAN SETTLEMENTS - A TYPOLOGY

2.1 The conceptual framework

The settlement of human beings in small or large groups, whether scattered or condensed, results in human environment interactions which invariably affect man's quality of life. Health, an important component of the quality of life, is influenced by the interaction, and hence the importance of dealing with the subject from the health point of view. Health problems of human settlements are viewed as reflections of the inability of man to adapt and/or adjust to various factors which constitute his physical and/or social environment.

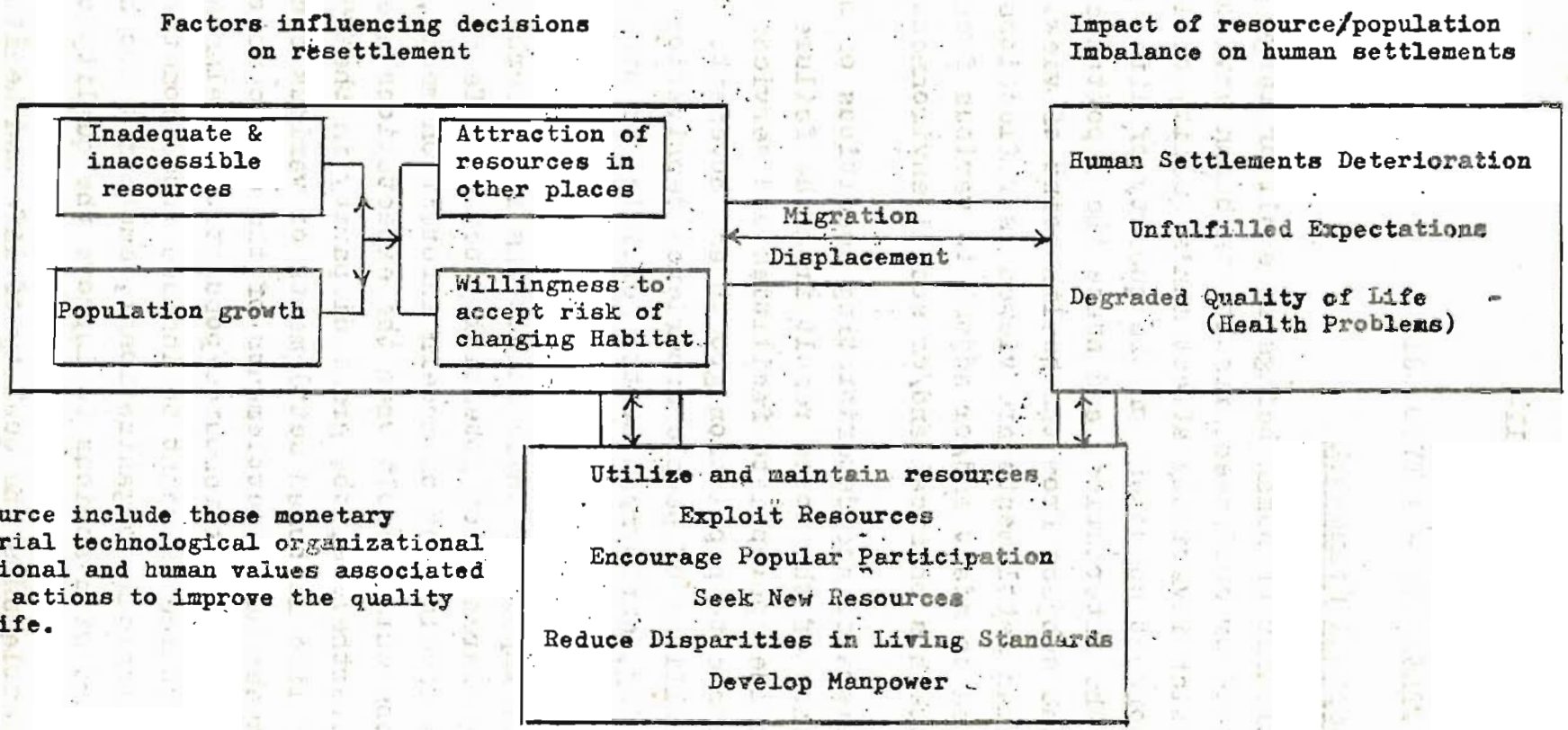
The deteriorated and deteriorating conditions of many human settlements of the world result from the failure of society to provide appropriate facilities and services for people in response to population growth and movement. As a consequence, millions of people experience deprivation of food, shelter, clothing, employment heattl servicle and other attributes of the quality of life.

The social impact of these conditions is exacerbated by (a) increasing awareness of potentially better life style, because of the development of modern information media, and (b) the frustrations which result when the expectations are not fulfilled. Nevertheless, the great disparity in the range of the quality of life in human settlements of various countries as well as between human settlements of the same country is fundamentally a result of resource/population imbalance. In this context resource is meant to include those monetary, material, technological, organizational, emotional and human values associated with actions to improve the quality of life.

In most settlements the quality of life and health status can be improved by efforts which move towards a better balance between resources and population.

The conceptual framework of the health aspects of human

FIGURE 1: CONCEPTUAL FRAMEWORK OF THE HEALTH ASPECTS OF HUMAN SETTLEMENTS



POLICIES FOR ACHIEVING AN IMPROVED BALANCE BETWEEN RESOURCES AND POPULATION

2.2 The resettlement process

The resettlement process is defined as the moving of people from one habitat to settle in another. It is formed of three main components, which are defined as (a) factors contributing to the decision to resettle;(b) type of resettlement; (c) adaptation and adjustment in the new habitat.

2.21 Reasons for leaving the original habitat

The basic reason for man to leave his current habitat is usually the inability to derive enough satisfaction for his perceived physical and emotional needs; in other words, the disparity between his aspirations and what the physical and social environment of the settlement is capable of offering. These motives may in many eases be translated into the seeking of a better material income; in other cases, it may be the desire to improve one's social status. Circumstances which threaten man's survival or dignity or inflict intolerable stress and distress on him are also prime compelling reasons for the movement . To this must be added the willingness and ability of man to take the risk that is involved in changing habitat.

These factors can be summarized as follows:

(a) Perceived lack, inadequacy, or inaccessibility of or to physical, social or emotional resources.

(b) The level of man's knowledge and information(including misingormation) about the existence in other places of the resources which would enable him to achieve his objectives.

(c) The willingness and ability of man to take the risk involved in changing his habitat.

2.2.2 Migration and displacement

For the purpose of this paper, two principal types of

resettlement have been identified:

(a) that resulting from migration
(b) that resulting from displacement.

Migration can be defined as the wilful movemet from one habitat to another for the explicit purpose of achieving certain objectives.

Displacement can be seen as the forced movement from one habitat to another. This may occur as a result of impinging natural forces such as desertification or flooding or on the other hand it may be the product of planned environmental change such as construction of dams. Within this same rubric of course must be included the influence of wars.

Both migration and displacement have much in common, and the distinction to be drawn between the two phenomena is often a fine one. It is not always evident, for example, where "push" factors and or where "pull" factors begin. For analytical purposes, however, it is worthwhile making the distinction, for in terms of the health implication for the individual, family and community, certain distinct implications often emerge.

Historically migration has been principally characterized by the resettlement of groups in or around existing settlements that are perceived as offering economic, social and cultural opportunities. In the contemporary setting, Particularly in some developing countries, rural to urban migration, as one example of this phenomenon, is accelerating and urbanization is increasing at what have hitherto been unprecendented rates. Development of new settlements has also often been an outcome of some migratory movements.

Displacement, on the other hand, may also lead to resettlement of population groups in or around existing human settlements or in areas where settlements did not exist before. In many cases, however, displacemet leads to the establishment of temporary settlements designed to last until circumstances allow the return of these groups to their original habitat, and often these temporary settlements have remained in existence so long that they even may be called permanent. The assumption that these settlements will be temporary tends to discourage responsible authorities from introducing fundamental resources compatible with the de facto permanency of these settlements, with the result that the quality of life in them is seriously affected. Permanent settlements for displaced groups are also seen to result from deliberate developmental efforts of man in introducing fundamental changes in the physical environment, e.g., man-made lakes resulting in permanent flooding of existing human settlements.

2.2.3 Adaptation and adjustment

Adaptation and adjustment are highly complex processes. In part the success with which they can be carried out depends upon the ability to create necessary social institutions and have access to necessary and appropriately designed health and social services.

Failure to achieve integration into existing institutions create new ones or have access to services, can have serious implications for the health of migrants, and may result in continued social marginality and even eventual back-migration.

Provision of amenities, work opportunities, and other conditions that facilitate adjustment of migrants must thus be seen as a primary prerequisite for successful resettlement.

2.3 A typology for human settlements

A typology of human settlements has been developed based on the analysis of the resettlement process. The desirability of a dynamic approach in considering this problem is emphasized. Because of their relevance to health and their importance in determining policy to deal with health problems of settlements, migration and displacement figured prominently in structuring the typology.

2.3.1 Settlements which result from rural-to-urban migration

Urbanization has presented a complex and often contradictory picture. On the one hand it has been a positive influence, providing a context in which better education, housing, health and social services in general could be planned To this extent it has contributed to the development of an . . . improved quality of life for many people.

At the same time, however, urbanization has also had negative impacts. It has promised a better way of life, it has raised hopes and attracted newcomers that it has frequently been unable to provide for. Rapid urban growth has precluded the possibility of planned and balanced development.

Historically much of the growth of cities followed the need for labour in industry and mercantile activities. Migrants to the cities were integrated rapidly into the urban way of life; the growth of the city and industrial development was closely interrelated. In many developing countries today the pace of urbanization has accelerated and is rapidly outstripping industrialization.

One of the dramatic consequences of this imbalance is that as migrants from rural communities come into the city they increasingly have difficulty finding employment and housing. At the same time, already overburdened cities are

unable to provide the type of services or amenities these migrants would require. As a result, much of the urbanization of recent decades has been characterized by the formation of shanty towns, squatter settlements and generally sub-satisfactory living conditions.

2.3.2 Traditional villages

Rural-urban migrations, like all forms of migration, are selective processes. Not all people leave or are equipped to leave. Those who do so are usually the young and those with high levels of dissatisfaction and aspiration. What they deprive their communities of in leaving is not simply numerical representation, but often much-needed manpower potential, creativity and a developmental force.

In many instances where rural communities have been so depicted, their political representation has been equally reduced. Investment in them is not as attractive either in terms of services or financial development, and they are condemned to relatively insecure or stagnant forms of existence.

Rural-urban migration then, while historically a basic contribution to development, has in recent years been the cause of overcrowding, poor living conditions and frustration. To many rural communities it has meant underpopulation and under-representation.

2.3.3 Existing cities

For reasons of economic pressure, rapid population growth and movement, natural physical deterioration and changing social and ecological circumstance, many large cities are today experiencing a profound deterioration. In terms of the physical and social amenities necessary for healthful living, they are no longer able to support their populations adequately.

As dilapidated sections are deserted for newer neighbourhoods and better physical surroundings, they are taken over by newcomers who invariably lack the economic or political resources necessary to improve or at least maintain them. Socially these areas cease being able to provide the type of environment with which the city was originally equated and in time this social blight is reflected in the health of the community, in its access to services, in its ability to determine its surroundings.

It should be borne in mind then that within this overall typology the deteriorating city presents a unique problem, one that cannot be resolved in the absence of determined planning, continued investment and vitalization.

2.3.4 Human settlements which result from government or private sector developmental efforts

This type of human settlement is of particular importance because it may in fact represent a prototype of the human settlements of the future. The location of such settlements can play a fundamental role in achieving the goals of an overall settlement policy. These settlements may be of an agricultural[1] industrial[2], commercial[3], or mixed nature. It should be borne in mind that the health requirements and implications of various types of human settlements are different and while major economic contributions of these projects to the overall development of a country are likely to increase available resources for health, many of these resource development activities will inevitably lead to certain negative health and enviromental health effects (i.e., schistosomiasis, onchecerciasis). The fact that human settlements around such

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1- e.g., land settlement projects.
2- e.g., mining, steel mills, etc.
3- e.g., suburban towns in affluent countries.

projects can be planned in advance, however, provides a unique opportunity to avoid the mistakes that have characterized unplanned development.

The major reasons underlying the inadequacy and/or inappropriateness of planning for settlements can be summarized as follows:

(1) The strong emphasis on physical planning and the neglect of social aspects of human settlements. The reasons behind this are numerous, among which one can mention the following:
   (a) the reluctance or avoidance of physical planners to invite social planners to participate as members of the planning team for human settlements;
   (b) the lack of operational social information which can be incorporated in the design of human settlements, and the lack of architectural prescriptions of the sort that are amenable for use by physical planners.

(2) The lack of participation in the design of planned human settlements. This is one of the most effective ways to take social values into consideration in the design stage.

(3) The tendency of physical planners to use inappropriate designs or materials for buildings for aesthetic reasons rather than to serve the needs of the settlers. There are many examples which demonstrate that, in the long run, the construction of such buildings is more costly, since the people either desert them or demand basic modifications which increase the total cost of the buildings.
   It is important to note that in the early stages of these development type settlements, great numbers of

migrant workers may temporarily settle around them, resulting in both permanent and temporary human settlements, which have different health requirements and implications. In many countries resettlement projects are of paramount importance as a major component of a population policy designed to achieve better geographical population redistribution. Resettlement can accomplish two vital aims: it can (a) decrease urbanization pressures and (b) increase productivity in agricultural-based economies.

Activities such as oil drilling, mining, space programmes, etc., lead to the development of temporary and sometimes permanent human settlements, many of which are located in remote areas, difficult to reach and often in severe climates. In addition to the health hazards in such settlements isolation may present a risk of a variety of social and mental effects.

2.3.5 Settlements for moving groups

Under this classification are included settlements designed for migrant workers, nomads, semi-nomads, tourists and pilgrims. Due to the improvements in transportation and communication, the numbers of people involved in such groups has increased markedly in recent decades. A salient feature of this type of settlement is that costs for facilities and services can often be apportioned between the transient groups, those that may benefit indirectly from the movement (i.e. industry, tourist establishments) and the government serving the location of the settlement.

From a health point of view, moving groups deserve special attention because of the high risk of their transmitting communicable diseases along the route of their travel, and also beacuse of the difficulties often encountered in providing

services to such groups as nomads and seasonal workers.

2.3.6 Settlements for displaced persons and groups

The need for human settlements for displaced persons and groups usually results from wars or natural disasters, e.g., floods, droughts. They are almost always of an emergency nature, are unplanned and frequently woefully inadequate in terms of sanitary facilities and other services. Displacement and the associated psychological suffering moreover creates attitudes which often hinder and delay adaptation and adjustment and interferes with the provision and acceptance of services, including health services.

Displaced persons and groups are at high risk for mental health problems, communicable diseases and malnutrition.

Since human settlements resulting from displacement of groups due to developmental efforts are often planned ahead of time and the people involved are often compensated for their losses, this makes it more suitable to include these human settlements under the type discussed in Section 2.3.4 which deals with developmental efforts.

3. HEALTH PROBLEMS OF HUMAN SETTLEMENTS

In this chapter health problems of human settlements will be discussed under three main categories.

(1) Health problems resulting from poor environmental health conditions, which include:
   (a) Housing
   (b) Water supply
   (c) Sewage and solid wastes
   (d) Pollution
   (e) Occupational hazards

(2) Health problems which result from overcrowding, lack of personal hygiene and malnutrition, which mainly include:
   (a) Communicable diseases
   (b) Parasitic diseases
   (c) Nutritional deficiences

(3) Health problems which result from predisposing conditions to stress and distress leading to mental and emotional problems

3.1 Environmental health problems

The health implications of man's physical environment (World health Organization,1972) are more obvious and have received more attention than health implications of the social and cultural environment (World Health Organization, 1975). Defects in the physical environment are perhaps more readily remedied, as there has been a great deal of research work done in this area and a great deal of practical experience has been accumulated. Cost is a major deterrent in improving the environment, and there has been a tendency, along with advancing technology, to use highly sophisticated methods of environmental adaptation and control. This is not always necessary and degrees of improvement are usually available, often at low cost.

3.1.1 Excreta

Human excreta is one of the most dangerous substances with which man may come into contact. He must keep it from direct or indirect contact with himself, his food or his water, and from insects, rodents or other agents that might be the vehicle for such contact. Fortunately, for his survival, natural forces are everywhere present to render this dangerous material innocuous, but this process takes time, and the problem is to dispose of a community's excreta (World Health Organization, 1974 a) so that no inadvertent contact is possible before the purification agents have done their work. Until this is done, excreta must always be regarded as an actual or potential harbourer of pathogenic organisms which may sicken or kill.

There are few fields of human activity in which religion, tradition, tribal taboos or superstition play a greater part than in the natural act of defaecation and, as far as smaller communities in particular are concerned, a knowledge of these factors is essential to the environmental planner. Even the orientation of a latrine is (in certain religions) obligatory, and incorrectly sited structures will remain unused.

3.1.2 Water

Water use for individuals can vary from a minimum of as low as 5 litres per day under nomadic conditions. to as much as 5,000 litres per capita in countries where are highly industrialized. In developing countries there are great and disturbing deficiencies in the provision of community water supply (Pineo and Subrahmanyam, 1975). Water use for environmental health or community water supplies is just one of the many demands made on our limited fresh water resources; other uses include aquatic recreatuon, irrigation, the dilution of liquid wastes, industrial processing, navigation, hydro-electric power and wild-life propagation. All of these uses

are of concern to the health planner and multi-purpose use is essential for conservation purposes.

Water, while essential to life, can also be a primary medium for disease, the most important water-borne diseases being typhoid, cholera, dysentery, and infectious hepatitis? Water must be considered polluted, however, when it is altered in composition or condition so that it becomes less suitable for any of its many uses. This includes changes in the physical, chemical or biological properties of the ater through discharges of liquid, solid or gaseous substances or significant changes in temperature? There is growing concern about the presence in concentrations exceeding recognized standards (Word Health Organization, 1971) of trace elements in water supplies owing to their possible carcinogenic or mutagenic effect; the presence of heavy metals in sea water can contaminate fish which may later be used for human consumption.

3.1.3 Food

Food sanitation is one of the basic and most important of the preventive measures that can be taken to assure a healthful environment. Food can serve as a vehicle for the transmission of several types of organisms pathogenic to man; including viral, fungal, helminthic, bacterial and endogenous protozoal species. The most important diseases transmitted include typhoid, hepatatis, dysentery and botulism. Food also includes milk and milk products, which, unless pasteurized, can be dangerously contaminated.

3.1.4 Soil and land

Land or soil pollution has been seriously neglected in the the past but has important health consequences (Ellis et al., 1969). Soil pollution is usually associated with the indiscrimate disposal of solid wastes, chemicals,

spent material from mining or ore-processing, sewage and sewage sludge or industrial derliction. Land pollution has both direct health consequences through contamination and aesthetic consequences which are a detriment to well-being. The health implications of the various uses of urban land are increasingly being recognized (World Health Organization,1972).

3.1.5 Insects, rodents and vectors

These carriers of disease are also important in man's environment because of their destruction of food supplies and wood buildings.

Insects may serve as passive carriers of disease through contact with infectious material, or they may serve as vectors and reservoirs of a wide variety of human and animal ailments. Important diseases include yellow fever, typhus, malaria, onchocceroiasis, filatiasis, schistosomiasis and encephalitis. Man's control of insects has only been sporadically successful, and still represents one of public health's most impotant challenges.

Man has brought rodents with him into practically every human settlement from the smallest villages to the largest cities. Rodent populations have both an economic and public health importance; they are reservoirs of plague,murine typhus leptospirosis and rate bite fever among other diseases and, in addition, their depredations in homes and food stores cause severe economic losses to the community quite aside from those caused by field rodents to growing crops. While control of rodent populations can be achieved by rodenticides, the best method of doing so is to deny them food and harbourage by improving community sanitation.

3.1.6 The home environment

In most countries, particularly in the less economically developing areas, the problem of housing is urgently important. The two most striking features of poor housing are overcrowding and the lack of basic sanitation. The physiologic effects of heat, cold, illumination and noise are also important (Gormosov, 1968). More than one thousand million people throughout the world live in sub-standard housing, and this is usually associated with poverty and filth. Although statistical evidence linking sub-standard housing with health is lacking (World Health Organization 1974 b) overcrowding, a lack of facilities for personal cleanliness, the prevalence of rodents and insects resulting from inadequate disposal of solid and liquid wastes, all predispose to disease and unhappiness. Home accidents rank high on any list of health hazards and there is undoubtedly a close correlation between the standard of housing and the prevelance of accidents.

Information which defines health effects of housing providesa basis for greater collaboration between the health sector and other sectors involved in the economic and social development of communities (World Health Organization, 1961 and 1967).

3.1.7 The work environment

Occupational hazards are encountered in industry, agriculture, mining and other working environments. The major categories of environmental stress are chemical agents, accidents and psychosocial phenomena. Work satisfaction is an important factor, a fact which is being increasingly recognized, particularly with increased mechanization. Dangers to health,however, exist in all work environments from the simplest farm(through contact with animals, the use of night-soil as a fertilizer or the danger from parasites

through irrigation or fishing) through mining and home industries to the most modern factory.

3.1.8 Air

Air pollution can cause or contribute to human disease and can precipitate undesirable physiological effects. Three dramatic episodes in this century, in the Meuse Valley (1930), Donora Pennsylvania (1948) and London (1952) have demonstrated that, in extreme cases, community air pollution can result in considerable loss in life and serious illness. However, the exact nature and extent of the association between air pollution and health have not been fully established, particularly with regard to trace elements and low concentrations of the oxides or sulfur and nitrogen. Odours can interfere with a general sense of well-being; polluted air can cause erosion of buildings, the erosion of metals and have a devastating effect on vegetation. Thermal pollution of the atmosphere is a cause of growing concern, and although it is a long-range problem, it must not be allowed to develop to a point where it endangers life on a planet as we know it.

3.1.9 Noise

There has been increasing concern in recent years about the adverse effects on health of noise. This concern is not confined to factories but is a problem throughout the urban areas as a whole. Noise, from whatever source, combined with vibration, may affect the nervous system, interfere with sleep and is incompatible with well-being. Motorized traffic, including aeroplanes, are particularly guilty factors and a great deal of effort is being made in these instances for noise control.

3.1.10 Radiation

Radiation is one of the most frightening of environmental problems, largely because its effects can be so disastrous and its cause, to the layman, is so mysterious. The importance of the problem is accentuated by the recent attention to energy utilization and with the increased use of nuclear power. Man is concerned, however, with both ionizing radiation(cosmic radiation, x-rays and nuclear power plants) and non-ionizing radiation (radio, television,micro-wave ovens), and with increasing knowledge of the mode of action of radiation more effective safeguards are being developed.

3.2 Communicable diseases

Communicable diseases are still responsible for high morbidity and mortality rates in human settlements in which poverty, lack of education,low environmental sanitation, poor housing, lack of nutrition and low standards of personal hugiene provide favourable conditions for the transmission and prevalence of pathogenic organisms. The frequency, length and mode of contact between people, and between man and certain animals plays an essential role in the transmission of communicable duseases as wekk as the consumption by man of contaminated water or food or exposure to air-borne pathogens. This makes the style of life of man of prime importance in the control of these diseases supported by proper sanitary facilities (Rajapopalan and Shiffman,1974) which provides him with reasonable amounts of safe drinking water and appropriate disposal methods for excreta and solid wastes. Immunization plays an important role in controlling some of these diseases as it diminishes the degree of dependency on appropriate human behaviour. Based on the above one can appreciate the value of decent housing in controlling communicable diseases, yet the exact extent to which the varioue features of housing, air

space, ventilation, sanitary excreta disposal, construction of floors and walls, etc. are related to specific diseases is not clearly understood. Nor are the interrelationships of each of these factors and their relative importance in the diffusion of infectious diseases clearly understood.

The impact of the resettlement process on the transmission of communicable diseases can result in outbreaks which, in addition to the human suffering caused may have considerable socio-economic impacts. Moving groups (migrant workers, tourists, pilgrims, nomads) are potential sources for the transmission of communicable diseases especially when they come in contact with isolated groups.

Association with animals, proximity to disease-transmitting vectors and improper ventilation are factors responsible for zoonoses, arthropod-borne infections and air-borne infections. Crowding is a factor in the transmission of communicable diseases.

Transmission of enteric infections is highly dependent on personal hygiene, the accessibility to safe drinking water, the sanitary disposal of excreta, and fly control. Research has shown that sanitary facilities, i.e. piped water and excreta disposal - are of greater importance for prevention of diarrhoeal diseases than fly control (Wolff eta., 1969).

It is known that the effect of the improvement of sanitation in rural areas is most noticeable in children under one year of age. Children living in a sanitary environment tend to contract diarrhoeal diseases less frequently than children living in poor sanitary conditions though they have the same economic and social background (Rubenstein et al., 1969).

3.3 Parasitic diseases

Human settlements, their location, design and construction have direct links with the prevalence and transmission of a number of parasitic diseases and thus with the health of inhabitants.

Most parasitic diseases are tranamitted to man within the confines of his human settlement where insect vectors of thediseases find suitable conditions for reproduction and refuge. These conditions are usually associated with poor practice in management of irrigation, drainge and wastewaters; poor practice incovering and/or disposing of excreta and solid wastes; and incorrectly located or designed or poorly constructed or maintained homes. Malaria, filariasis, intestinal helminthiasis amoebiasis, Chagas' disease and leishmaniasis are among the major parasitic diseases that are contracted by man in his habitat

Although not exclusively so, some of the vectors of parasitic disease have become well adapted to the home environment such as: the anopheleine mosquito vector of malaria; the Triatoninca bug which breeds in cracks in walls of houses and transmits Chagas's disease (American trypanosomiasis); and the Phlebotomus fly, the vector of leishmaniasis.

Schistosomiasis, another widespread parasitic disease, is transmitted to man within, or in the surroundings of human settlements where man comes into contact with infected water. However, the transmission and spread of the disease is facilitated by insanitary, inadequate or inconvenient water supply and excreta disposal and scarcity of public health and treatment services in the human settlements. The insanitary conditions in human settlements and the habits imposed by these conditions are the major factors in the propagation and spread of a number of additional human parasites such as eggs of hookworm, enterobius etc.

The environs of human settlements are where most vectors and intermediate hosts of disease breed and propagate. Water, when

improperly managed, serves as a breeding place for mosquite vectors of malaria, bancroftian filariasis, Dengue haemorrhagic fever, yellow fever, etc; Simulium fly, the vector of onchocerciasis; or snails, the intermediate host of schistosomiasis. The soil, especially in rural areas, harbous the egg and/or the infective agents of a number of parasitic diseases, e.g. hookworm, ascaria, strongyloides, trichuria, cysticerosis, amoebiasis, etc. Trees and bushes may harbour the tse-tse fly, the vector of sleeping sickness, African trypanosomiasis.

3.3.1 Malaria alone is reported to have effected, until recently, two-thirds of the population of the globe and accounted for 300 million cases per year, with 3 million deaths. It is transmitted by Anopheles mosquitos which breed in water especially in slowmoving streams, drains, seepages, in shallow marshes and on the banks of water reservoirs and lakes, or in ponds and rainpools, etc. They requir e clean and clear water, but can adapt and breed in highly polluted sewage effluent. They can breed and propagate in rural as well as urban settlements and transmit the disease under a variety of conditions.

The debilitating effects of malaria are very serious. In some countries, particularly in rural areas, large proportions of the population are infected, imposing great demands on health care services and facilities and causing great losses in productivity. The public health and socis-economic importance of the disease and the need and priority for its control are apparent and should form an essential part of any development plan in areas where the disease is prevalent. Development projects for agricultural extension or water resources are especially vulnerable to malaria and other parasitic diseases. The great expanses of water they create in the form of lakes or irrigation networks provide suitable conditions for the extended breeing of vectors and intermediate hosts of parasitic

diseases, and for the spread and intensification of transmission.

3.3.2 Schistosomiasis

It is now confirmed that schistosomiasis has established itself, or is being established, in practically all the major lakes created in Africa for hydroelectric power or agriculture, and in the irrigation schemes. The human settlements around the lakes or in their irrigated agricultural areas, have all recorded a sharp intensification of infection among the local population. The problem is aggravated by the influx of a great number of new settlers, some having no previous exposure to the disease and by the movement of the population helps to spread the disease even further to neighlouring settlements.

In settlement around man-made lakes, and in irrigated agricultural areas, due to frequent contact with infested water, the rate of schistosomiasis infection is very high, often in the range of 80 per cent or 90 per cent. For the same reason the diseases is considerably higher than in other endemic areas, especially among the children and the younger working group, i.e. fishermen and farmers. Considering the high prevaience rate of the disease and its intensity, the resultant losses are considerable and particularly serious in development projects where the success of the scheme depends on the well-being and productivity of the manpower. Studies made by Maogreith (1958) indicated that in certain areas the working capacity of those affected individuals was well below half the normal capacity.

Schistosomiasis is reported to occur in 71 countries w with over 1,363 million population of which about 600 million are restimated to be at risk and 125 million actually infected. The economic losses due to schistosomiasis may be classified

as due to (1) resource use, or the cost of manpower and material used for providing health services, (2) resource transfer, or the cost of income transferred from the healthy to the sick to mitigate the burdens of illness, and (3) resource loss or costs reflected in reduced national products. of the three, only the latter may be measured with some degree of accuracy, the other costs being inseparable from those of other diseases.

An attempt to estimate thelosses in material production of goods and services was made by Wright (1968) using the estimates of a number of persons totally and partially disabled from schistosomiasis. From the severity of the infoctions in each country, he estimated that some 25 million persons are partially and 2.65 million totally disabled in endemic areas of Africa, America and Asia. On the basis of per capita GNP this gives an annualloss of over $ 641 billion, which is considered to be only a conservative estimate and is based on minor prevalence rate. The actual losses are considered much higher.

Two other major parasitic disease, onchocerciasis and American trypenosomiasis (Chagas' disease), despite their comparatively limited geographical distribution, are considered to have great public health and socio-economic importance.

3.3.3 Onchocerciasis is estimated to affect 20 million persons main mainly in tropical Africa and partly in the mountainous areas of tropical America. It is, however, in the savannahs of tropical Africa that its effects are most serious. In these areas, onchocerciasis is considered to be a major obstacle to agricultural development, where fertile land and irrigation water exist, because the presence of the disease restricts human acticity. The disease if called river blindness and is transmitted by the blackfly genus Simulium which breeds in

running water, particularly in rapids of rivers, spillways of dams and in irrigation channels. The female blood-sucking fly becomes infective about one week after feeding on an infected indicidual and may transmit in turn the tiny filaria worms to other indicidnals. In the body of the new person, the worms grow and produce millions of microgilaria which migrate to the epidermis, including the eyes, and progressive loss of sight and then blindness.

The disease affects most seriously the adult working population and settlements with 20 per cent and more blind inhabitants are quite frequent near water courses. Apart from the suffering that the disease causes, the swarms of flies and their savage attack and bites create such nuisance and discomfort that the inhabitants are forced to leave their villages and settle in dry land far from rivers.
As such fertile lands and water are abandoned and the population lives on meagre agriculture, and depends on the rainfall, it is obvious that in areas where the disease prevails, unless the disease is controlled and the fly is reduced any attempt at socio-economic development is bound to result in failure.
3.3.4 American trypanosomiasis (Chagas' disease) is considered a disease of human settlements and its prevalence depends on the type of human settlement and on its location. A properly designed, constructed and maintained house is most effective against the establishment of this disease in a community.

The disease is usually transmitted to man by insects belonging to the sub-family of Triatominae which hides in cracks of walls and ceilings of houses and bites and feeds on sleeping man at night. The infection is contracted by contamination of the site of the bite with faeces containing the infective parasite. The disease may also be contracted outside human settlements but the proportion of outdoor transmission to man is comparatively small.

American trypanosomiasis is endemic in areas of South and Central America Where a population of 35 million is estimated at risk and 7 million infected. The disease is frequently assoeiated with cardiac complications and with colon and cesophagus dilatation. The infected individuals normally show no clinical manifestaion and may remain undetected until the dannge to the heart and other organs is considerable, evaluated. But, due to the severity of the pathological lesions it causes and the fact that infected individuals remain infected for life and that effective and safe therapeutic drugs are still lacking, the gravity of the problem can be visualized.

3.4 Non-communicable disease

It is widely held that cardiovascular disease, mainly myocardial infraction, atherosolerosis and hypertension are more prevalent in the big cities than in rural areas. Epidemiological studies have shown that myocatdial infarction and hypertension were much prevalent in developing countries and in isolated rural population groups as compared with people living in big cities of technologically advanced countries. More refined, recent studies however indicate that this may not be so. Hypertension patterns do not seem to follow any trend in relation to degree of urbanization. In remote and primitive areas, blood pressure may be lower in certain population groups than in westernized population groups, and remain low with age. However, in other population groups living in the same socio-economic conditions, the blood pressure may rise with age and reach levels comparable with those of westernized societies.

Salt intake as well as genetic factor are thought to play a role in blood pressure levels rather than degree of urbanization. One study in Kampala showed higher blood pressure in 'urban' males as compared to 'rural' males. However, females

showed no difference. Another study on prisoners of war in World War II and on prisoners of penitentiaries in Detroit also showed higher blood pressure under conditions of crowding. However, on the whole, there is no clearcut trend relating blood pressure to conditions of settlement.

As far as myocardial infarction is concerned it is true that the rural developing populations have very low practically no incidence of myocardial infaretion as compared with the population groups of industrialized countries. However, myocrrdial disease where diet, degree of physical activity, predisposing genetic factors and a great many other factors play a role. Degree of urbanization does not seem to play any major role. On the one hand we have studies in rural developing populations like the Indians in the U.S.A. Indian tribes who live practically under the same socio-economic, rural conditions, experience a great differenoe in incidence of myocardial infarction. On the other hand also in highly developed countries difference of myocardial infarction appear, regardless of the size of the city under study. This has clearly pointed out by the WHO myocardial infarction register. Many cities, particularly in Europe, were surveyed, and they showed different incidence of myocardial infarction which does not relate at all to the size of the city and degree of urbanization.

The only thing which seems to be the mediator between type of human settlement and cardiovascular disease is the degree of stress, typical of industrialized affluent sociaties. This factor seems to be present in all the studies dealing with migration. In rural conditions of developing countries, myocardial infarction and hypertencion are uncommon, but they become common in the groups which migrate to more developed conditions.

The famous study on the Irish brothers also showed that myocardial infarction is much less prevalent in people who remained in Ireland as compared with their own brothers who moved to Boston and took up the way of living of that city.

In Israel, groups that immigrated from Yemen a long time ago experienced a much higher incidence of myocardial infarction than the groups who immigrated only recently from Yemen. The early settlers, therefore, adopted the way of living of Israel and had a higher incidence of myocardial infarction.

Zulus who moved to Natal have a higher incidence of hypertension than the Zulus who kept on living in rural condition in their own country. Italian immigrants to Switzerland and Jewish immigrants to Israel were also found to have a higher incidence of ischaemic heart disease. On the other hand, the famous study on the Roseto population in the USA is indicative of a low incidence of ischaemic heart disease in people who, in spite of their immigration from Italy to the USA, kept their old way of living.

Therefore, on the whole, all these studies point to a negative, harful effect of migration on incidence of hypertension and of myocardial infarction. Whether this is due to the stress of acculturation or to the picking up of the dietary and living habits of the new country is not clear-cut but the fact remains that moving to another environment may be deleterious to the cardio-circulatory function.

Cerebrovascular diseases also do not show clear-cut trends in relation to urbanization.

Of course, there might be countries where, occasionally, trends of higher incidence of cardiovascular diseases are found in urban areas as compared with rural areas but this applies to only certain races, or to one sex and not to

the other, or to certain age groups. It is not a general trend.

Among the cardiovascular diseases, rheumatic heart disease shows a fairly clear trend of higher incidence in rural areas as compared with cities, and within the cities in slums or crowded or very poor housing conditions. This would be expected since the etiological factors, streptococcus is transmittable, and would therefore be influenced by settlement conditions. Nutrition, natural resistance and availability of health care services could also exert an influence.

There is no evidence of effects of different types of settlements on diabetes. As for chronic pulmonary diseases, crowding and poor living conditions are likely to exert an effect on the transmission of infectious agents, but no specific study has reported on the relation between, for example, the type of housing and chronic pulmonary disease.

3.5 Mental health

The resettlement process certainly leads to fundamental changes in life and therefore is apt to produce mental and physical symptomatology (Cassel, 1970; Jaco, 1970). However, research has suggested that relocation to better surroundings does not appear to ameliorate the incidence of neurotic symptomatology and some studies have even demonstrated an increase in such symptomatology (Martin et al, 1957; Taylor and Chave, 1964; Hare and Shaw 1965; Fanning, 1967). It also been shown that unskilled rural migrants who come to cities from their own country are at greater risk for developing psychoses than are rural migrants to urban areas outside their own country (degaard, 1945, 1961). In particular, however, an increased prevalence of psychoses will be found among male migrants to urban centres who migrate from cultures which lack family cohesiveness (Minta and Schwartz, 1964).

3.5.1 Rural to urban migration

From a motivational point of view, little is known about what makes people leave rural settlements. We know what makes them go to the cities is the possibility of earning more money and raising their standard of living. But the few careful studies we have on the matter (Schreiber, 1972) show that there are forces within the rural community which push forward and pull against urban migration. Better understanding of these forces could provide keys which would slow down the process or urbanization, particularly in those many instances where the rate of expansion of the economy almost guarantees adverse outcome for urban newcomers. The adverse outcome is guaranteed because of lack of basic sanitation, housing, jobs, etc.

To the social psychologist, however, one of the obvious pulls that most rural environments lack are what is technically known as secondary reinforcers. Food, sex, water, sleep and some drugs are called primary reinforcers. They are so classified because they will strengthen or reinforce behaviour leading to them after a period of time without them and have clear-cut effects at a physiological level. Secondary reinforcers are also reinforcing to behaviours leading to them but they do not produce and significant physiological effect. Most species will work relatively hard for secondarily reinforcing events and some of these are easy to understand, such as working for money which leads to purchase of primary reinforcers. Other types of secondarily reinforcing events include simple exposure to new objects, however, to lights and sounds and "stimulating" events. Certainly men have capacity to be reinforced by an incredibly wide range of such stimuli. If entertainment, variety and the unexpected are embodied in the city along with satisfaction of basic material needs, the steady depletion of rural settlements can be predicted regardless of how improved they may become from the point of view of health or other basic amenities. We suggest earnestly that

transistot radios, television, films, and increased variety of goods (not necessarily "useful" ones) should be allowed to supplement the steady diet of health, welfare and education that we now offer to spur rural development. The effects of the introduction of such innovations on reducing urban migration would require careful assessment.

3.5.2 The urban environment andmental health

The most accurate statement one can make about the relationship between the urban environment and mental health is that it is a complicated one. And yet, it is the adverse mental health and psycho-social effects of urban settlements which have compelled our attention in recent years. It is believed that the cities produce an excess of , insanity, neuroses, alcoholism, drug addiction, criminality, family break-up, lack of social solidarity, suicide and homicide. The city is viewed as a place where we are either overstimilated into states of nervous tension alternating with depression and anomie and/or blunted in terms of our relationships to the extent where we refuse to become involved, however, marginally, in the misfortunes of others.

To a certain extent, social science research findings support the above perspective, but the results shift over time and they vary from country to country (Mitchell, 1968; Gruenberg, 1963). In the area of psychoses, for example, the rural-urban rate differences have never been sufficiently studied and within recent years particularly no sharp differences in overall rates are reported. Earlier in this century, there did appear to be a rate differential favouring the rural environment (U.S. National Institute of Mental Health, 1974; sanua, 1969, 1970). Now this balance would seem to be, if anything, shifting back in favour of urban centres.

Even without further information, it can be asserted that an increased prevalence of serious psychiatric disturbance in urban centres can be predicted in those countries where families will be broken up by rural-urban migration.

Milder but seriously troublesome neurotic behaviours are perhaps easier than are the major psychoses to relate to the frustration of living in noisy, drab, cramped housing (Lemkau, 1970; Carlestam and Levi, 1971; Schoor, 1970). Suicide would be less associated with overcrowding than with high density and low crowding, or in less technical terms, the lonely person living by himself in a crowded city. The high incidence of suicide in some societies among people living in such conditions makes one search for architectural, community planning solutions as well as the more traditional mental health approaches. Privacy is not an unalloyed benefit and more attention needs to be given to designing buildings which support or even compel a high degree of socialization among occupants.

Certainly reported, detected crime has a proven high incidence in urban centres as compared with rural environments. However, as far as reported property crimes are concerned, the excess of incidence observed in the urban areas can be largely accounted for by the greater numbers of young males of low socio-economic status in urban as against rural areas (Ohlin, 1968). Proportionately this group is most involved in criminal acts of all kinds, but particularly in property offences. Some isolated rural districts have extremely high homicide rates (Wolfgang and Ferracuti, 1967) and some extremely congested urban areas have almost non-existent rates of this crime, e.g. Hong Kong. There are clearly profound social conditioning experiences which

account for the frequency of violent inter-personal crimes in society.

Studies show that opium, cannabis and cocaine consumption in rural communities is often well integrated into occupational and social functioning (Buch et al., 1970). However, in contemporary urban settings, drug dependence problems are frequently encountered in younger consumers than found in rural settings (Westermeyer, 1974) and such usage is often associated with social deviance and criminality (Finestone, 1957; Ding and McDonald, 1969). There is growing concern about the widepsread prescription of psychoactive drugs. Prescription of these drugs, particularly the barbiturates, exceeds medication in any other category in some developed countries.

With few exceptions surveys have shown that increasing urbanization is clearly associated with rising rates of alcohol consumption and related problems (Brezard, 1960, 1964; Cahalan and Cisin, 1968; Mulford and Miller, 1959, 1960 Popham, 1959; Wallace, 1972). Alcohol is an important feature in most crimes of violence (Wolfgang, 1967; Amir, 1971) and alcohol consumption is implicated in 50 per cent of the deaths resulting from traffic accidents in Australia, and in from 10 to 70 per cent of all traffic accidents (Moser, 1974). It is one of the few social problem areas that is associated with rising socio-economic status and education, and this in turn suggests that public education campaigns might be an important element in any approch to reducing the adverse health and social effects of alcohol consumption in urbanizing areas.

We should expect more asthma, more allergies, more cardiovascular diseases, and more ulcers in urban developed societies as compared with rural environments. To some extent, the growing literature in this field demonstrates that this is the case (Richter, 1959; Hamburg, 1967; Hinkle, 1968; Schwab, 1971).

3.6 Accidents

In many countries accidents have now become one of the most important causes of death and incapacity and since they frequently occur in early and middle adult life the economic loss to a community is often veryconsiderable.

3.6.1 Traffic Accidents

Traffic accidents are among the most serious forms of a of accidents in terms of loss of life and incapacity. This is especially true in highly industrialized countries where number of cars per capita is high. The case of the USA is illustrative Of a total of 1,930, 082 deaths for the year 1968, 114,864 were due to accidents and of these 54,862 were due to traffic accidents. In the age group5 - 34 accidents were the largest single cause of death and of these, from one half to two-thirds were associated with traffic accidents. The problem is also serious in England and Wales. Statistics show that males are more likely to die than females and while the peak in deaths between the ages of 10 and 34 is very obvious in the former it is barely detectable in the latter. This is probably due to the larger numbers of males who doive motor vehicles, particularly in connection with their work, and possibly to the greater tendency of young males to take risks. With both males and females there is a pronounced rise in old age when the elderly find themselves less able to avoid approaching hazards.

Similar patterns are detectable in other countries (Norman, 1962). Although a considerable amount of information has been assembled in many developed countries particularly Europe (United Nations, 1974) international comparisions on a global basis are difficult since in many countries a considerable proportion of the population may be in rural areas with comparatively few traffic problems. Considerable differences are apparent between countries (Norman, 1962). Countries which

have spent money on preventive measures such as road safety on testing and approach of cars and on testing drivers are at an advantage as also are those countries which have taken action to deal with alcoholic drivers.

Although at present road traffic accidents are primarily a problem of industrialized countries, it is apparent that they present a problem to a greater or less degree for almost every country of the world and one which will become progressively more serious in developing countries as the number of cars in these countries increases.

3.6.2 Domestic accidents

The pattern of domestic accident statistics for the USA and England and Wales shows the importance of domestic accidents as a serious cause of injury and death as compared with other accidents. The dominant victims of such accidents are children under the age of ten and elderly people of advanced age. Females, particularly elderly females, are more affected than males. Data for international comparison are scanty but the international information we do have available indicates that domestic accidents arising from falls, fire and poisoning are the principal causes of death and injury in most of the countries investigated. Poorly maintained homes and furnishings are one cause of these accidents.

Evidence from the USA and otherindustrialized countries suggests that many previously reported "accidents" among young children may in fact be more appropriately categorized under mental and social health problems of the parents because they represent the "battered child syndrome". Nevertheless, it is extremely difficult to obtain data that would allow us to make that distinction.

3.6.3 Industrial accidents.

Industrial accidents also are a serious cause of loss of

life and permanent disability. Such statistics present difficulties for comparison because of the problem of the lack of a uniform classification scheme for such accidents worldwide.

In new settlements arising as a result of development projects it is reasonable to assume an increase in such assidents when the settlers are first introduced to complicated industrial or agricultural machinery.

3.7 Nutrition

The nutritional status of various human settlements is basically dependent on both the quantity of available food and on the quality and level of health services these communities receive.

At the level of the individual the choice of diet is affected by economic, social and cultural variables among which the availability of food, level of income, and food habits seem to play an essential role. It has been documented that changes in food habits of immigrants occur rather later than the acceptance of language, or acceptance of newspapers of the host country and in some cases, change of religion (Stoedzel). New settlers usually look for "their" foods and they tend to buy them even if they are more expensive than other available foods. On the other hand, temporary settlers whose main goal is to make money and go back home very often tend toeconomize on food expenditure to the detriment of their health.

The availability of certain food items greatly affects the nutritional status of the settlement community. Nomads represent an interesting case. Among them meat and milk products are available in abundance and these are high sources of protein. They are also high fat sources. The results observed are that nomads have a very good nutritional status

except for some cases of hypovitaminosis. Interestingly, in spite of their high fat intake, nomads do not suffer from cardiovascular problems to any great extent. Unfortunately, the severe shortage of food for nomads and their livestock caused by the draught these last few years has led to reports of malnutrition among nomadic children for the first time. (World Health Organization, Regional Office for the Eastern Mediterranean, 1973).

The normal fluctuation in the availability of food is more liable to affect nutritional levels in human settlements in rural areas than it is in those in or around urban centres. In crowded, unplanned, low income settlements where food shortages frequently occur, young children are liable to suffer from protein-calorie malnutrition, rickets and lack of Vitamin A, and to have a high susceptibility to infections. The result is usually a high infant mortality rate. Children in the weaning age are a special high risk group especially with working mothers who refrain from breast feeding and do not give the infants enough supplements in their diet. These settlements are in special need of child welfare programmes, including MCH services and cheap protein-rich weaning foods.

The aged and others on fixed incomes are also at risk from malnutrition as many studies in the USA and Europe have shown.

4. THE ROLE OF HEALTH AGENCIES IN IMPROVING HUMAN SETTLEMENTS

4.1 The need for a comprehensive strategy

The overall approach to the improvement of human settlements, the quality of life and health status is directed at improving resource population imbalances. Potentially, many of the imbalances that exist in some countries can be improved by (a) interventions that would improve the efficient use of existing resources and/or find new resources (i.e., resource activities), and (b) interventions that would influence population distribution (i.e., human resource activities).

Intervention strategies such as these can be applied in most settlements at any time. Incorporation of these concepts in national and international development policies, however, presents a much greater opportunity for effective and widespread application. But before such interventions can be realized it will be necessary to have a much deeper understanding of (a) how physical and social environments of settlements interact to affect health status and (b) how health considerations can be aligned with the values of the other economic and social sectors involved in development of human settlements.

4.2 Resource activities

The overall objective of this set of activities is to increase and improve the resources that are available to the the country by:

(a) improving utilization and maintenance of available resources;

(b) exploiting unutilized potential resources; and

(c) seeking new resources.

The impact of the above activities on health is two-fold:

1. Increases available resources for health activities both by decreasing its burden through (a) and augmenting them through (b) and (c).

2. Brings new challenges for health through (b) and (c).

4,2,1 Resource utilization and maintenance

The first of the resource activities is referred to as utilization and maintenance. Changes in the pattern of utilization of resources should aim at the rationalization of both investment and consumption in order to minimize unnecessary waste in national resources. This can be achieved through better planning and managment, and the use of improved technology; most important, however, may be the change in the underlying human behaviour which affects utilization patterns. This presents the major challenge, for it requires fundamental changes in both the individual's and society's systems of values. From the health point of view, changes and improvements in patterns of consumption and utilization can have very favourable impacts on health and can lead to considerable savings in health resources which can be directed to satisfy unmet health needs. Significant changes can be anticipated, for instance, in the prevalence of diseases resulting from over. consumption of food, alchol, medicinal drugs, etc. Similarly reductions in the consumption and proper utilization of certain energy-producing materials can lead to marked improvements in environmental health through a reduction in the level of environmental pollution.

Within this same context can be included those types of savings in health resources that are associated with appropriate design and maintenance of housing and community facilities, (World health Organization, 1965; Andrzjewski et al., 1964). By the same token, improved community sanitation for the control of rats and insect vectors and pests could reduce the need for curative health services and in the case of some countries make available singnificant quantities of food resources that would be otherwise contaminated.

The rationalization of investments in the environmental health services deserves special emphasis.

In the case of water supplies, there is a renewed interest in the simple slow-sand filter in many parts of the world. It is labour-intensive, but is simple to operate, has few mechanized parts and is reliable (Huisman and Wood, 1974). Wells might also be the method of choice where ground water is available; they too are simple to construct, easy to protect and the water does not require treatment, except perhaps chlorination.

While water-borne sewage disposal is the method of choice (and may be necessary in built-up communities having a piped water supply), privies and communal facilities may be entirely adequate. Although communal latrines and bath-houses are not usually considered a desirable alternative to private accommodation on a permanent basis, they have been successfuly used for many years, particularly if they are well-maintained. Communal laundries (both for villages and towns), where housewives can carry out clothes-washing, have a number of advantages. They can save water, where water is short; and by removing the necessity of women entering a stream of river they can help reduce the incidence of schistosomiasis, and at the same time reduce the pollution of water courses with soaps and detergents.

Communal slaughterhouses for small areas, consisting of little more than a concrete slab, drain, with a hanging rail and access to safe water makeshift, unsightly and insanitary installations.

In small, stable settlements, such as farms or rural villages, excreta disposal is almost always accomplished the use of pit privies or latrines, excreted material dropping into a pit where it remains undisturbed until purification is complete. The main problem, under these circumstances, is to ensure that there is adequate separation between the latrine and the well.

As settlements increase in size and population becomes denser, individual pit latrines bcome loss practical in the space available. A further complication is that people travel or work too far from home to use their own latrines, and communal facilities become necessary,

Some quite large cities still rely on a combination of pit latrines, nightsoil collection and group disposal units. Often these devices were adequate when domestic water was in in short supply, but with improved water services, a sewerage system can almost invariably be justified economically, as well as providing much better environmental protection. Where water is not piped to individual homes, itis often possible to install communal latrines connected to the sewer system. It is evident that are economies of scale in providing sewerage facilities in large metropolitan areas as compared with smaller cities, towns or villages.

In villages or other small settlements the collection and disposal of garbage and refuse is usually a hand operation carried out either by the householders themselves or by sanitary labour. Disposal is by burial or by buring (downwind of, and at a suitable distance from, the settlement) in a pit or crude incinerator intended to prevent burning particles from being blown about. Waste material will be chiefly organic, easily burnt or degradable.

In larger communities the work will nearly always be carried out by sanitary labour who will also be responsible for community cleanliness. To the organic matter will be added paper, glass and plastic containers; land-fill processes are advisable or crude burning may be used. Hand trucks or similar vehicles will be used for conveyance.

In large urban or city settlements, the proportion of glass bottles, plastic containers, paper and metal refuse increases as does the total amount to be collected from each household. Economic and other considerations determine the types of storage, the collection vehicles and the method of final disposal.

4.2

4.2.2 Resource exploitation

The second type of resource activity that can be included within the third link is designated resource explitation. Its aim is to augment existing resources through the exploitation of other potential resources that have previously not been utilized.

While resource exploitation activities, they can also create undesirable impacts on health (section 2.3.4). Within the health sector a veriety of activities can be undertaken to augment available resources through exploiting unutilized potential resources.

The major challenges for the health sector are:

(a) how to tap potential resources from other sectors of the economy to achieve health objectives

(b) how to benefit from local community resources in the development and maintenance of community health services.

The first challenge requires that health professionals acknowledge a responsibility to communicate to other relevant disciplines in the settlement, salient information on health problems and activities so that interrelationships, costs and benefits are understood.

Unfortunately this is not usually easy to do for three reasons:

(i) The difficulty of demonstrating in quantitative terms the gains that can accrue from the application of health criteria in human settlements planning.

(ii) The lack of information - in operational terms - which enables other disciplines to incorporate health recommendations in planning and/or implementing their activities.

(iii) The lack of communication between disciplines.

In many cases the recommendations of health officials do not get beyond the philosophical level and are therefore inadequate for planning purposes. It is difficult for health professionals to persuade other disciplines to aim at achieving health objectives in planning their activities, unless they can clearly demonstrate to those who control the funds the benefits of allocation.

The health sector in some countries should make an effort to exploit national agricultural and industrial potentials to develop substitutes for import items required for health activities. This should be fitted within the overall economic policy could result in considerable savings on hard currency expenditures for the health sector. In case health manpower shortages the use of existing tradional healers may be planned to widen the scope of coverage. Examples of successful use of such personnel in some parts of the world are encouraging.

The second challenge requires the people of the settlement in the development and management of their community health services. This requires the development of mechanisms through which community members can participate in problem indentification, problem soliving, planning and implementation.

It is interesting to note that the WHO/UNICEF joint study on Alernative Approaches to Meeting Basic Health Needs of Population in Developing Countriesl states that community involvement in health activities is a crucial factor in the effectiveness of health services at the local level.

1) Document JC20/UNICEF-WHO/75.2. See also WHO Chronicle, 1975, 29; 168-187.

The techniques of popular involvement in health activities presented by the study were different in each country, but all seemed to favourably influence the delivery of health services.

4.2.3 Seeking external resources

External resources are sometimes necessary to meet certain unmet needs in human settlements in some countries. Because of a variety of costs it is important to seek external resources only where they are necessary and only after a careful plan is prepared for their utilisation. External resources should augment and not distort established national priorities. In addition to financial assistance some countries may choose to seek technical assistance which can be obtained from international national and private agencies, as well as through bilateral agreement. The seeking of technical resources should also be carefully planned in order to maximize the outcome. In the case of human settlement, technical assistance could be more meaningful if it is meant to supplement and not substitute for local expertise. Preparatory work should be done by local experts and preliminary conclusions formulated before the external expert starts working on the problem.

4.3 Human resource activities

The overall objective here is to achieve a better population distribution by influencing factors that tend to compel people to move out of their original settlements. This is possible through (a) providing people with necessary knowledge and skills to improve their income within their settlement; (b) providing facilities and amenities that improve the standards of living and reduce the disparity between standards of living in various human settlements; and (c) enhancing factors which help adaptation and adjustment to the physical and social environments through popular participation in various activities of the settlement. Human resource activities in this conceptual framework are grouped under three main categories:

(i) Manpower development
(ii) Reducing disparities in living standards
(iii) Popular participation

4.3.1 Manpower development

Three points should be emphasized as regards manpower policies which seem to be of special importance in dealing with the population aspect of human settlements. These points are:

(i) Development of necessary skills from among the settlement community for the development and maintenance of the of the human settlement.

(ii) Increasing the chances for female employment as a means of improving family income and encouraging smaller family size.

(iii) Technological advances (mechanization) and their impact on manpower policies.

One of the main reasons for rural-urban migration is the lack of employment oppertunities. Since the magnitude and type of employment opportunity is dependent on the structure and size of the economy of the settlement, comprehensive rural development policies are often the only feasible approach to curtailing rural-urban migration, and within this framework development of agro-industries seems to be the most feasible approach for rural development. If this is the case, manpower development should be geared to produce skills and aptitudes suitable for the implementation of such activities.

Manpower development for any one human settlement should take into consideration both the short and long-term local manpower needs. Technological advances in many fields have increasingly enabled communities to perform activities with much lower skills than were required in the past. Since this is possible, the economics of providing services to communities should be based on the stratification of activities according to levels of knowledge and skills required to perform specific functions. The referral system in health care is one example in this area; it offers a solution for improving the level of health care by increasing accessibility, coverage and utilization. The fact that the skills required for detecting illness,

applying simple treatment and care for minor ailments, disseminating health information necessary to increase the community's awareness of the importance of health behaviour, implementing simple sanitary measures and immunization techniques, etc. can be acquired at reasonable cost to the community by members who will usually stay in it, provides an opportunity for many countries that lack any kind of health service with a practical solution. Even in communities that can afford higher skills, many view this approach as one that offers a more effective basis for providing health care.

4.3.2 Reducing disparities in living standards

In many countries, the gap between the standards of living in the villages and cities is enormous, giving the city an irresistible attraction to inhabitants of rural settlements. The second type of human resource activity is thus directed towards narrowing the disparity between standards of living in various human settlements by providing facilities and amenities that will reduce the need to migrate from rural areas to the big cities. This can only be achieved through comprehensive rural development policies which aim at increasing local emploment opportunities. This in turn may be the nucleus of creating sizeable rural settlements which can economically justify the provision of a better and wider range of services to the community.

Demographic change plans should also take into consideration population growth rates which may seriously interfere with achievement of objectives. Given existing population growth rates in many parts of the world it is inevitable that without appropriate and adequate family planning, standrads of living (i.e. sanitation facilities, housing, levels of education, etc.) cannot hope to be increased, nor can there be any hope of improving the development and utilization of human resources. Excessive population growth and wastage of human potential are inextricably linked. Therefore considerations of population growth rates should from an integral part of any such development

plan. Improvements in the health status of the mother and children are among the significant gains which a population policy can contribute to the improvement of the quality of life, as a result of a smaller family size. Ample documentation is available to support this statement.

4.3.3 Popular participation

Popular participation is an effective means of resolving differing views on priorities and selecting choices of programmes for public action which affect human settlements. The fact that contemporary planning techniques are incapable of integrating societal values in the planning process makes popular participation an indispensible mechanism in dealing with various aspects of human settlements.

Equally important is the personal initiative and work which can be stimulated by "self-help" projects. These add both output and savings which are crucially important in terms of meeting the needs for sanitation and other facilities and services of human settlements in poorer developing countries.

4.4 The developmental role of health

In modern times health care has come to be viewed as each man's right and hence derives its justification from the fact that it satisfies one of the basic human needs. The expression and satisfaction of this right, will in accordance with our view of the development process, differ in different developmental situations. By looking at the instrumental role of health services one can better appreciate the interdependence between health and other social sector plans which together with the economic plans constitute the national development plan frame.

Health services have an educative function which, though often unnoticed on the surface, is profoundly significant for development. The medical anthropologists more than other professionals have brought the educative function of health to the attention of development specialists. Their studies of the beliefs and practices of traditional cultures reveal the great significance placed on health in these cultures. In almost all

cases healing was attributed to invisible forces and not the agent performing the healing rite (i.e. witch doctor shaman etc.). With the introduction of modern scientific medicine attitude changes occur which significantly, though perhaps indirectly, affect economic and social development.

Development involves much more than economic changes. In fact, it involves basic changes in attitudes in order to achieve the major change from a traditional, often tribal, rural society to the innovative, individualistic and technical society associated with high levels of living.

The most important societal changes are those which involve changes in attitude for it is only with changes in attitude that we find changes in behaviour of a permanent type.

Thus for example, if it is found that a health goal of a given development situation is to have healthy children, not only physically strong but mentally alert a significant change in the eating habits of the parents must be introduced in order that protein-deficient mentally deficient children will be minimized. Eating habits often involve attitudes with respect to core cultural variables which are difficult to alter.

There are two attitudes associated with health which are useful to consider here (Taylor, 1968 and Nute, 1969). The first deals with life expectancy and the second, which is related to the first, deals with what people think about cause and effect.

4.4.1 Life expectancy

When there is an increase in health activities there is an increase in the health of the individual. With the improvement in individual health status a change in attitude toward life expectancy is observed. As individuals begin to be able to count on a longer life there is a shift in attiude away from the passive acceptance of the status quo or of the unalterable will of invisible forces. This shift away from unquestioned acceptance

of the status que and toward more personal involvement in the determination of one's future leads to changes in attitude and behaviour toward the notions of planning, time, savings and investment. Planning for the future makes sense where general improvements in health have lengthened the life expectancy since the individual can expect to be around when that future arrives.

Where a person, a village, a tribe, or a nation experience rapid improvements in health status and hence life expectancy, this new attitude permeates other aspects of life and more and more people will be affected.

4.4.2 Explanations of causation

The second change in attitude deals with changes in the explanations of cause and effect. Explanations of causation are present in all societies but what occurs is a shift in the area where cause is to be sought. This shifting of the area where cause is to be sought is of immense significance for development, for the shift that occurs is toward a notion of causation consistent with national development requirements.

With respect to these attitudes in health, it should be noted that both traditional and modern scientific views see the origins of illness in invisible agents. Of course, the difference is that in the traditional society these invisible agents are non-human spirits or ancestors while in scientific medicine the "invisible agents" are micro-organisms or constructions of the human subconscious.

Both views, however, imply the existence of a technology for the manipulation of the causes. The technology of modern scientific medicine yields much more reliable, prediciable, and lasting results in the long run than does the technology of the traditional healers.

This predictability of the modern technology affects the individual's attitude by enlarging the number of variables over which he sees himself as having control and hence prepares him psychologically, since he has a higher sense of personal

efficacy, to seek control of more variables in order to further increase his predicatbility.

Improvement in individual and group health status not only affects attitudes and behaviour patterns of individuals. To some extent at lest it affects existing social institutions. An interesting case in point is the effect of improved health care on the extended family system. The increased availability and accessibility of health services indirectly contribute toward a decline in the extended family system since the extended family system operates primarily because of a scarcity of elders.

4.4.3 Health and productivity

Some work has been done attempting to establish, at least conceptually, the relationship between social services and economic productivity.

In the early days of development planning and administration scant attention was given to the social sectors such as education, health and community development. Resources and thoughts were devoted to the hardware of development, primarily to the industrial sector, since it was assumed that such investment was the key to development - and well it may be. Later, however, in the light of experience, individuals, development agencies and governments who considered themselves to be the agents of development realized, in brief, that there was a missing link and that more careful attention to infrastructure development was necessary in order to increase the payoff of the gains in agriculture and in industry.

Development specialists now refer to investment in human capital as an integral component of any comprehensive development plan. Mushkin (1962) and Schults (1962) were among the first scholars who devoted considerable attention to the question of investment in human capital.

Real gains in productivity are offset by the uncontrolled population growth. Facing the facts of the population problem carry implications for all social and industrial sectors. On the one hand, greater attempts must be made to improve agricultural yields, to explore other resources for food potential and to increase the productivity of industry, and on the other hand, the health sector plans must include comprehensive family planning programmes which are national in scope though they may be conducted under the auspices of a separate ministry.

The point is that the population growth rate has to be curbed. It is interesting to note that recent findings bear out the fact that improvements in general socio-economic conditions of families motivates the bearing of fewer children (United Nations, Economic and Social Council, Commission for Social Development, 1970).

This is just as true in the less industrialized situations, though they differ in culture and religious traditions, as it is in the highly industrialized countries.

4.5 The shortage of health resources

There is an appalling shortage of health resources in the world but most especially in the economically less prosperous nations. The distribution within these countries of the health manpower is always in favour of the urban centres leaving the rural areas, where most of the people live. Part of the reason of this maldistribution can be attributed to the fact that both public and private sectors have traditionally stressed hospital services for acute illness over integrated health care for the whole community.

The facts indicate that poverty of resources in health will be with the poor nations for some time to come but these same facts make it all the more important to use our existing resources to the health sector.

4.5.1 The allocation of resources

In today's world, allocation of resources depends to a great extent on the degree to which satisfaction of particular needs such as the need for health care, is instrumental in achieving or contributing to over all development goals. Priorities of allocation of resources can either be done on rigorous cost-benefit analysis, purely political basis or a mixture of both. The health sector usually fails to compete with other sectors especially in cases where cost-benefit analysis is used. This has resulted in a lot of effort being spent in applying rigorous economic analysis and econometrics to health hazards and health activities. It should be emphasized that while some aspects of health are amenable to this treatment, it is still extremely difficult and sometimes undesirable to apply it to many aspects of health.

The increasing interest of health professionals in applying such analysis tends to de-emphasize the non measurable attributes of health which in many situations are far more important than the measurable attributes of health. The educative role of health in shaping human attitudes for development is a point in case.

4.5.2 The need for planning

While planning is not a palliative for all problems ecountered in the health system it is nevertheless a means of overcoming certain hazards or aspects of arbitrariness which result from unplanned situations. This is particularly important in terms of the physical environment where man's ability to disturb or alter the great forces of nature has increased to the point where mistakes or unknown effects may have disastrous and perhaps irreversible consequences (world Health Organization, 1970).

If a country does not make choices through health plans the choices will be determined anyway but very haphaszardly

either by ability to pay, geographic location, by publicity given to a particular case or class of health hazard, or to a new technique e.g., heart transplanting, and the like. Planning at least has the advantage over non-planning in that it provides a decision method for choosing which health technology should be developed and for determining the long run as well as short run costs of investing in any particular technology.

Since there is a scarcity of health resources especially in developing countries, planning provides a rational mechanism of:

1. rationing the country's existing health resources;
2. detailing a course of long-range action to increase the supply of health resources which require long years to develop;
3. implementing methods whereby the productivity of existing health resources can be increased.

4.6 Health delivery system

The delivery system can be found wanting in several important areas as follows: Design of the services; Planning and management; Blockage of health plan implementation by health professionals; and irrelevant education of health manpower.

4.6.1 Design of services

A health system which is to be appropriate for the developing situation must be designed in such a way that it reaches into the homes and communities (as well as the health centres) in order to have any significant impact on the regulation of health hazards. The western designed systems tend to be structured in accordance with purely clinical dictates.

4.6.2 Planning and management

It is not enough to set planning objectives with respect to health in the planning office. These objectives have to be

implemented and this requires co-ordinated efforts of all those engaged in the delivery of health care. Such co-ordination is a prerequisite to effective and efficient delivery.

4.6.3 Blockage of health plan implementation by health professionals

The tremendous resistance of health professionals, especially physicians, to delegate parts of their traditional roles is a well known fact. It constitutes a major obstacle to delivery of health care. Such an obstacle is minimized when a country follows an organization of the delivery system which places the professionals in the situation of salaried employees of the hospital, polyolinic or other health facility where all work as a team. Roemer (1969) has devoted considerable attention to the advantages and disadvantages of the direct versus indirect approach to the delivery of health care and devotes some attention to this problem of resistance to delegate functions.

4.6.4 Irrelevant education of health manpower

We do not deny the necessity to have physicians and other health personnel trained in aspects of clinical medicine but we do deny that clinical training to the exclusion of training for community medicine should be undertaken in developing nations. The young phsician returning home to his country in Africa or Asia often cannot face up to the needs he finds. He spent many years in training only to find that his hard won skills are not appropriate for his role at home. He has been taught to think of himself as a clinical phsician. At home, where he is responsible for the health of 50,000 to 100,000 people he feels unsuited and frightened in the face of the challenge of whole communities waiting desperately for skills which he alone has. He cannot handle the quantity problems nor the variety of health hazards. If he stays in his country, he usually ends up ignoring the real problem and goes to an

urban centre hospital where the skills he learned are at least able to be used in a somewhat familiar setting; meanwhile, the people continue to suffer for lack of preventive health measures.

From this discussion of the problems of implementation of health plan objectives we must now move to a consideration of how to evaluate or follow up the health plan implementation. Evaluation then is but another step in the process of planning which health agencies must undertake.

4.7 Evaluation of health systems

Evaluation is a diagnostic activity upon which action should follow. Information generated from the evaluation functions of measuring, comparing and interpreting is feedback which is used to decide on the type of action programme necessary in order to correct the actual performance of the system. Thus evaluation is an integral part of the planning process for it provides the direction that replanning should take.

4.7.1 Goals

Any system is evaluated on the basis of the achievement of its goal(s) and these goals are reflected in the output of the system itself. In the evaluation of the achievement of a system goal or of system goals we attempt to answer two questions. The first is how efficiently was this goal or set of goals achieved? This means, stated another way, at what cost was every unit of output which reflected the realization of the goal(s) achieved? A system is said to be efficient if it achieves a unit of output at least cost. Costs include the cost of utilization of the resources necessary to produce the output (e.g., in health this would be manpower) (doctors, nurses, auxiliary workers; facilities - clinics, hospitals, etc; equipment; and financial resources). The second question,

and more generally difficult to answer is simply stated as follows. How effective is this output in realizing some ultimate goal?

4.7.2 Inputs and outputs

We evaluate any system by its ability to achieve its goals (that is, its planning goals). In the practical order the system is judged by the relation between the imputs and the outputs and one how such relation affects the goal. In the health field the first problem in evaluating output is in our lack of knowledge about what costitutes output. Too often health system inputs such as number of beds, number of physicians, number of nurses per population, etc. are treated as system outputs. So far we do not have any direct measures of the output of health though we can say that the output of health is a certain level of health status which could be achieved and which could be considered as an increase in the health of the human capital. From this, we can see that it is not accurate to cosider such statistics as decline in deaths due to certain causes or decline in morbidity as statistics reflecting the output of health. Such an approach is negative and misses the point that we should think in terms of health output as a positive thing, as an increase in health status.

4.7.3 Flow of health services

In evaluating the health system we can measure the change in health status by measuring the flow of health services either in real units or in money terms. This is, at present, the only way have to approximate a measure of the output of health. A measure for evaluation of the health system which is highly desirable, but a measure for which we do not yet possess accurate enough tools, is that of measuring the change in the level of health status by measuring the change in the level of health status by measuring behavioural changes due to or caused by the flow of services. An example would be measuring the

effect on or contribution toward increased productivity resulting from the flow of health services. This is extremely difficult to do, if not impossible, because of the fact that productivity relates to the way in which time on the job is spent in productive effort and not only to the actual time spent on the job. Of course we can and do measure the productivity indicator Absenteeism due to sickness and this does serve as a useful guide.

As As can be observed from the above discussion of evaluation of health system goals, such evaluation is highly dependent on health information systemsto provide the data for comprehensive evaluation of the system and on the clear statement of health goals. The more precisely the health system goals are stated the more helpful the evaluation will be as a source of feedback into the replannig process.

4.7.4 Health service statistics

Countries are developing statistics on the input factors and from them we can obtain an idea of what is available in a country to affect the flow of service. Statistics are also being developed on the utilization of services by the population. The problem here is that these statistics give the evaluator of the health system only the information as to number of service-seekers; such statistics do not tell the evaluator who needs the services nor whether the services for which there are statistics are actually appropriate to the service-seekers'needs in terms of overall health objectives. We would like to see statistics relating the service-seekers actually needing service to how effectively the services were used.

4.7.5. The post-evaluation action follows two approaches. One is control oriented and the other the change oriented (Hassouna, 1971). In the control approach the evaluator assumes that

the goal(s) and the whole plan of the system being evaluated is sacred, beyond question, and that the only fault lies in the performers. Such a method of post-evaluation action results in the evaluator trying to close the gap by whipping the performers in the gap if actual performance is less than expected. The change oriented evaluator searches the model, i.e., the whole system and its goals are subject to question. He elicits the support of the system performers in identifying the course of action to be followed to correct the deficiency. In the developing nations the change oriented approach is very important. It is the only way that we can hope to read the environmental clues as to the way of better achieving the goals if they are realistic and if they are notrealistic of how to better state them.

When evaluating systems, one should guard against the tendency of comparing a system in relation to another system which does not face the same constraints. Goals have to be evaluated with an understanding of their relevance to a particular country, not in relation to how they compare with the goals of any other country.

5. HEALTH AND ENVIRONMENTAL HEALTH SERVICES IN HUMAN SETTLEMENTS PERSPECTIVES

5.1 Prerequisites for action

It is true to say that in the case of many countries the health problems of human settlements have assumed unnecessarily serious proportions because of the lack of action at oppropriate stages. In many cases the prerequisites for action - aside from the fact of whether it is the right or wrong action - are lacking, inadequate or inaccessible. These prerequisites for action could be summarized as follows:

(a) A reasonable level of knowledge and information about the problem
(b) A suitable technology for intervention
(c) A mechanism through which the technology could be applied and its results monitored and evaluated

The discussion of these points is of utmest importance for understanding the perspectives of health and environmental health services in human settlements. The first item will be discussed under the heading "The state of knowledge and Information" and the second item under the heading "The state of Health Technology". The third item will be discussed under the title "Organization and Management of Health Services".

5.1.1 The state of knowledge and information

In the discussion of the "Typology of Human Settlements" (Section 2.3) it was suggested that existing knowledge of the relationship between health and the various types of human settlements is inadequate. What information is available is not action-oriented and hence not appropriate for policy, planning, implementation or evaluation levels. Much more inter-disciplinary research is needed.

5.1.2 The state of health technology

The ability to intervene at any stage of a health problem is dependent upon the availability of the type of health technology needed.

It goes without saying that despite the importance and necessity of both the curative and rehabilitative techniques, both are inferior to preventive strategies in minimizing costs of ill-health, i.e. human suffering, individual and community social and economic costs.

Availability of a health intervention technique however does not necessarily mean that it can be used everywhere. Both socio-cultural and political factors intervene to define the acceptability and economic costs involved and hence the appropriateness of the technology. Schistosomiasis for instance is associated with the opening up of lands to irrigation is some developing countries. The chain of infection, however, is understood and the technology for control exists. But the disease continues to spread because of (a) inability of influencing the attitudes of people about defecating and urinating in irrigation channels and (b) the inability of planning to provide adequate sewage collection and disposal facilities in the settlements of these irrigation areas.

It must be emphasized that the economic costs of using a particular technology should take into account the costs of obtaining the necessary skills required to apply the technique. This is of special importance because in spite of the ability of the community to pay all other types of economic costs, the scarcity of skilled manpower may become the main obstacle.

The challenge that faces health professionals today is thus not only how to develop new techniques and add to the wealth of health technology, but to create and improve systems

that can use appropriate technology. One way this challenge can be met is by placing more reliance on simple, effective, acceptable and less costly techniques.

5.1.3 Organization and management of health services

The organization and management of health services is normally influenced by the patterns of organization and management of service activities at national or local levels. It is also determined by type and level of technology that it is proposed to use. Stratification of health care services into functional levels with a single entry point and a referral machanism has hitherto been generally accepted. Nevertheless the behavioural changes required from both health workers and consumers for the successful adoption of such a system raises fundamental difficulties concerning implementation in different socio-economic and cultural contexts.

The integration of all aspects of health services, preventive, curative, promotive and environmental health, is idealized by many health professionals, yet in actual practice it has amounted in the past to either housing the various health activities in one facility or assigning all these activities to one health worker, e.g., at the local level. To be effective, however, it takes much more. Integration is an attitude of mind and can only be achieved through an educational process which in the case of health amounts to fundamental changes in health curricula.

Participative management of health services is an attractive idea which has been successfully implemented in some countries. Just as the previous two concepts, referral and integration, the successful application of participative management is highly dependent on changes of attitude in both health workers and consumers.

5.2 The community development approach

5.2.1 Orientation

The concept of community participation in the management of the health agency and its services brings us to a discussion of community development as suitable approach. However, there must be adequate backing (technical, legal and financial) to reduce the serious impacts on the community which result from the lack of co-ordination and co-operation between the various agencies in the community. This is of paramount significance for the health agency because many of the community activities which greatly affect health are not directly supervised by the health agencies.

- Because a community development approach has often been lauded as a successful mechanism for the diffusion of technoloical innovations it is useful to note some of the principal facts and hypotheses about it in considering it as a mechanism through which health technology can be applied.

Community development can take place in many ways: as the result of major political changes on a national basis or by a more capillary-like action on the community.

5.2.2 Contact and communication

Contact and communication are important and should be carried out in the proper way: it must be a two-way process, must stimulate action by, not impose it on, the community. One should be prepared to accept slow progress and even hostility and initial (temporary) failure, and the fact that the community may be below the "take off" point and therefore not be ready for it.

5.2.3 Community potentialities

Community development goes far beyond the process of indentifying needs and asking for help. Itinvolves the

realization of community potentialities also to solve problems, to mobilize the necessary resources and to create the local organization that best suits the needs. This may provide a local integration of activities that at higher levels appear under different departments and that, at these levels, may be objected to. At times some (healtly) contract may therefore be expected between "development below" and "guldance from above".

5.2.4 Point of entry

There is some evidence to support the view that, although it may be necessary to use different approaches in different situations, a most successful "point of entry" for community development is to stimulate ability to produce more food, better food, to improve marketing of products, to change land use and ownership (in this order). Small loans for better equipment or to initiate activities may produce substantial improvements.

5.2.5 Primary health action

Many social scientists and health professionals feel that primay health action as a result of community development is the answer to the inability of governments to meet the essential health needs of many different kinds of human settlements. This is defined as a series of simple activities specifically aimed at meeting the essential health requirements of individuals, families and communities and directed to improving the quality of their lives. Primary health action should be undertaken in the most practical and viable manner consistent with local realities using mainly local resources. The essential elements may vary from one community to another and may include: emergency care; reporting of notifiable infectious diseases; assistance to vulnerable groups such as mothers and children; routine treatment; referral; fertility regulation; health education and all sorts of environmental improvements.

5.2.6 Environmental improvements

Environmental improvements occupy a special place because of the capital investments involved - that may become available from outside - and the need for continuous maintenance that may have to be the community. One important aspect is that although the community may easily recognize the importance of certain improvements, they may still be unacceptable because they have come too early in the community's own agenda and are competing with more urgent priorities (e.g. food).

5.2.7 Education

Education must be an integrated part of all efforts of community development. It should be realized that action may not be possible without education and that education without action is sterile, meaningless and risks being irrelevant. Education operates at different levels in the community and may be addressed to all or to specific groups (i.e. mothers and children).

5.2.8 Financing

Financing of community development efforts is not a separate or secondary issue. Alternatives are financing from "above" or "below" or various combinations of the two. Although it is important that the shift in emphasis by governments in favour of primary health action must be reflected in budgetary decisions, it is even more important for the community to be committed in the short or long run to self-sufficiency, otherwise this will never be realized. Several local schemes have been tried: "seed money" to be paid back by the community, individual payment for services using different types of local income (land, sheep, etc.) pre-paid services, etc. The latter may be very useful to introduce community leaders to the realities and mechanisms of the cost of health care and to force them to find imaginative solutions to reduce these costs (e.g. environmental improvements).

5.2.9 Local Manpower

A fundamental aspect of community development concerns the mobilization, training and proper utilization of local manpower, i.e. manpower that becomes available from within the community. The mobilization of personnel takes place at different levels according to the conditions of the community: it may be the education of selected people in a family; the training and utilization of traditional healers; or the formation of more specifically oriented village health workers. For the village health worker it is important to be part of and selected by the community, to be trained to implement simple tasks, to receive community recongnition in the form of some kind of remuneration depending on whether the health worker is in full or part-time employment and to establish a good and effective relationship with the professional health service workers. In many cases, especially in small communities, health assistance is only one function of the 'multi-purpose village worker' who, in this case, deals with matters having to do with food production, environmental hygiene, education and health care.

5.2.10 Evaluation

Even simple community development projects require some mechanism for evaluation in response to local needs of people or agencies outside the community. It is important that, as far as possible, information is used that becomes available in the process of doing the work and, if this is not possible, the collection of information should take place with the least disturbance to the community.

A recent study (the WHO/UNICEF joint study on Alternative Approaches to Meeting Basic Health Needs of Population in Developing Countries) has emphasized the inherent limitations of the "disease-oriented machinery" to improve the quality of life of the community. This is due to the multiplicity of socio-economic/cultural factors which influence health and are

far beyond the scope of a disease-oriented machinery. Actually the fundamental reason for the failure of the disease-oriented machinery stems from the fact that it views human settlements as crowds, not as communities. Yet a full approach to solving human problems is not easy because of the lack of such an attitude to human problems among various professionals dealing with such problems and the absence of an operational mechanism to relate the various factors involved in a specific human problem in a meaningful way. Thus the only effective way of dealing with human problems is to involve men as members of a community in shaping their future and solving their community problems. This requires thedevelopment of a mechanism through which community members can participate in the planning management and evaluation of the various activities in their community. It is interesting to note that the WHO/UNICEF joint study referred to earlier states that community involvement in health activities was a crucial factor in the effectiveness of health services at the local level. Various ways of popular involvement in health activities were presented by the study. These ways varied in different countries but all seemed to influence favourably the delivery of health services.

5.2.11 Contributions of the community

A way of making health a community affair is inducing the community to contribute to health activities either in kind (construction of waterworks as in Ivanjica (Yugoslavia) and Tanzania; of health posts as in Tanzania) or in cash small financial participation as in Bangladesh and Jamkhed (India). Another way is to link it with activities outside the health field. In Ivanjica, shows are organized featuring films on health together with films on health together with films on agriculture and other subjects; in Jurain (Bangladesh) health education on nutrition is combined with an agricultural project and social activities provide an entry point to health

action; in Jamkhed the project has identified itself with a general improvement scheme where objectives comprise agricultural upgrading, water supply and housing; in the Department of Maradi (Niger) multisectoral groups have been organized to promote health, rural development, literacy and education.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This paper has dealt with the relationship between settlements, the way people live in their settlements and health.

The discussion demonstrates that there are important health implications which vary according to the mode of settlement, even though data are lacking which would allow verification of this by quantitative analysis.

For this analysis of health and human settlements a comprehensive approach was chosen which views health as but one variable, albeit an extremely important one, in understanding the problems and processes of human settlement. An effort has been made in the analysis to form practical approaches for dealing with health and human settlements, taking into account abstract concepts such as urbanization and population distribution but at the same time being mindful of the detailed technology essential for copeing with specific prolems.

Because of the extraordinary diversity and complexity of human settlements a typology of human settlements was presented to facilitate analysis and aid in the delineation of differing health implications resulting from various types of human settlemnts.

The main obstacles which face national governments in d dealing with human settlements arise from three general sources:

(1) Man's limited ability to cope with his environment;
(2) The lack of a general theory of development;
(3) The lack of an adequate theory of technology transfer.

6.1.1 Man's limited ability to cope with his environment

Evidence from many countries and many types of settlements suggests that man's limited ability to cope with his environment is a major problem. Very little is known about the precise dynamics which would explain why some individuals and/or groups are able to adapt and adjust to new environments or why certain individuals and/or groups succumb to certain health hazards in the adaptation/adjustment process and others do not.

6.1.2 The lack of a general theory of development

The lack of a general theory with predictive capability as well as after-the-fact evaluation capability that would enable planners to fully understand the process of human settlement is a serious handicap to action by national governments. As it is today, the science of Ekisties, which is an endeavour to understand the process of human settlement, offers only partial explanations and tends towards a static approach stressing the physical variables.

A suitable and operational framework is needed within which various factors that affect men's quality of life in various modes of habitat can be related so as to develop well co-ordinated action-oriented programmes and projects. The lack of such a framework has led to an increased tendency to apply partial solutions to specific interrelated problems with unsatisfactory results.

In many cases action does not go beyond symptomatic treatment of problems either because of the inability to define the underlying causative factors or the inability to deal with them because of technological contraints or scarcity of resources. The lack of a truly effective national and international mechamism for an equitable distribution or rechanncling of national or world income as a means of redressing the population/resource imbalances is a case in point.

6.1.3 The lack of an adequate theory of technology transfer

An adequate theory of technology transfer is needed which would have predictive as well as descriptive and explanatory capability. Such a theory would necessarily define the inter-relationships between the psychological, social and economic variables. What national governments attempting to deal with the problems of human settlement need from technology transfer researchers is a prescription which would not only attack the problems but the underlying causes of settlement problems as well. What they actually have to guide them are, at best, conflicting and partial theories of technology transfer. This is keenly appreciated in the health sector where in at least some modes of habitat, correction of some health hazards can be met with existing technology properly applied. The crux of the matter lies in determining how to "properly apply" existing technology.

It has been observed that there is a tendency to view the solution of a specific problem in one country as the universal solution for apparently similar problems in other countries. Attempts at technology transfer which are unmindful of differing cultural settings invariably fail.

Likewise, attempts by a technology holder to advocate less capitalintensive technology often end in failure because the technology holder has ignored the psychosocial variables involved. Often representatives of technology holding countries are individuals with predominantly engineering and business backgrounds who have very little understanding of psychosocial dynamics involved.

Potential technology recipients in developing countries often seek to obtain the "latest" technology whether it is appropriate to their countries' circumstances or not. Some people perceive modernization or development as a goal-directed

process intended to close the modernity gap that they fell exists between their countries and the countries that they perceive an their "significant other" countries (Hoerning, 1969-70). Hence their desire to have precisely the same technology as their "significant other" countries regardless of its suitability.

Both the technology holders and potential receivers of the technology may be unaware of or unwilling to analyse the paychosocial dynamics involved. When this occurs the result is the application of unsuitable technology. For example, in many settlements water purification - which is an essential health service - can economically and adequately be met by using wells or slow sand filtration. Instead, highly mechanized plants have often been constructed, and these plants are not only initially very expensive but have higher operating and maintenance costs as well.

6.2 Recommendations

In light of these considerations the following recommendations are presented:

6.2.1 Research and planning

(1) Fundamental (basic) research priorities should be redirected to:
   (a) research which is development related
   (b) research which offers the most potential for generation of indigenous technologies. That is, the aim should be to generate new technologies and reorient old technologies more appropriate to local conditions which are need oriented rather than simply transferring technology developed elsewhere and for other purposes and conditions.

(2) In line with the above, the objectives of research should be structured so that:

(a) they are need-oriented
(b) they increase self-reliance as a strategy of development

(3) The comprehensive interdisciplinary team approach to research should be encouraged to replace the individual type of research. Foreign experts should complement rather than substitute for national researchers and health researchers should be included in these interdisciplinary teams.

6.2.2 Implementation and evaluation

The recognition of problems, the will to act, a framework to guide action, and the capability to act expressed as the presence of a suitable technology and the possession of requirements to apply the technology (i.e., manpower, finance, organization, and the presence of popular support) are among the important antecedents to action. The main channels of action are preventive, curative and rehabilitative. The extent to which any one or all channels are appropriate to remedy a specific health hazard is subject to: the availability of an appropriate technology, the acceptability of the technology to the community; and the costs, economic and social, of applying the technology. Hence, it is only when confronted with the specifics of a given type of habitat and concomitant health hazard that detailed and particular recommendations can be made. However, the following suggested health priorities are recommended as a guide to orienting action since they deal with the four major factors influencing the health of human settlements (namely, effect of malnutrition, impact of communicable diseases and of environmental hazards, and inadequacy of health care services).

(1) Malnutrition - The effect of malnutrition can be very great in affecting health and in rendering people more susceptible to other health hazards. The extent to which malnutrition is a problem in any given type of human settlement can

and should be assessed by health researchers as part of the attempt to develop early warning mechanisms and to guide planning and development in human settlements. There are some generally recognized standards of necessary caloric and protein-calorie intake per day. Where malnutrition is a problem of a significant number of people a major portion of health resources should be allocated to ameliorate it. WHO in conjunction with other international agencies should work out techniques to easily and economically detect unacceptable levels of malnutrition and should assist in designing long range (as well as immediate relief) projects to control malnutrition.

(2) Environmental health - Undoubtedly the major environmental influence in some countries is deficiencies in basic sanitation particularly the lack of adequate pure water supplies and satisfactory methods of disposal of human wastes. Environmental hazards have a profound effect on health and mortality. Hence provision of pure water and adequate sanitation services should be recognized as the most important direct health service which can be provided. Again, concerted attempts should be made to develop indigenous technologies or to use existing technologies to provide these fundamental services to all elements of the population.

(3) Communicable diseases - Although there have been great advances in communicable disease control they still have a profound influence not only on mortality but also in reducing the work capacity. Communicable diseases are the major cause of illness and premature death, especially among young children, in developing countries. Priority should therefore be given to (a) provision of pure water and improvement of sanitation; (b) mechanisms for early detection and evaluation and (c) personal preventive and curative services. The focus of the detection and preventive services should be on

the 0-5 age group where the impact of these diseases in most acute.

(4) Health care services - In many parts of the world personal health care services are inadequate. Personal health care services without the most important health services of pure water and adequate sanitation facilities are relatively useless in elevating health status since theywould in effect, be giving only symptomatic treatment. Hence, it is extremely important to have the correct sequencing of health services in human settlements.

In many countries of the world consistent, clear and basic health education is needed in order to induce behaviour change and to augment the effectiveness of other health services. Research has shown that community workers who have the same background and orientation as the people of the community are more successful in inducing behaviour change than are professionals such as dectors. It is therefore important that the training of health personnel be reoriented to increase the number of auxiliaries and health change agent aides. The delivery of health care services can best be viewed as a problem of technology transfer in which communication variables are important and in which the health personnel should seek to persuade and motivate their clients to adopt appropriate health behaviour in order to minimise the impact of existing health hazards and/or to prevent other health hazards from having an effect (e.g., importance of persuading people that personal hygiene is a preventive measure; that dietary and exercise behaviour patterns can minimize the probability of heart trouble and so on).

Every effort should be made by health personnel to adopt a client oriented rather than a doctor oriented approach in the establishment of priorities the design and the delivery of health services.

6.2.3 The role of international agencies

Since a comprehensive approach as suggested above requires a high degree of co-ordination and co-operation the following are especially important:

(1) Facilitation of pooling of resources to enable international agencies to play a more effective part in attacking health hazards of human settlements

(2) Promotion of international assistance projects which support and do not distort national priorities and planning objectives.

(3) Promotion of a team approach in which qualified nationals are given a leadership role and in which national institutes are used as the channel through which agency services are provided and through which research is conducted.

These recommendations are summarized in Fig. 2.

- support national institutes
- exchange of research results
- develop new technologies
- manpower training.

- manpower training encourage pre-investment studies
- develop realistic objectives based on psycho-social as well as economic facts

- undertake demonstration projects
- implement after conducting research to determine major problems and their impact.

- team approach
- client orient-action
- determination of criteria for success
- early warning devices.

Fig. 2. SUMMARY OF RECOMMENDATIONS

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