TOWARDS MEGALOPOLIS

by

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1.   DEFINITIONS AND BASIC ASSUMPTION

We are asked - on the basis of whatever evidence is available - to attempt the more accurate understanding of the process of the future evolution of man's system of life and human settlements which are its expression in space.

To clarify and understand the complex thinking procedure that is to be followed, it is necessary to state clearly some fundamental definitions, assumptions or hypotheses - based on systematic observations - which implicitly or explicitly constitute the basis of our effort.

Man lives in human settlements, which are the territorial arrangements made by him for his own benefit.

Our real concern is human settlements of all kinds ranging from nomadic (whether with animals in the desert or trailers on the highways) to very large cities, from their overbuilt and overcrowded central parts to their farthermost outskirts.

Furthermore, with exception of very marginal clusters, "hunter" groups or village dwellers, all settlements are more or less part of a broad human settlements system.

People tend to cluster around central facilities of various scales. One of the most characteristic scales in any city, the neighborhood scale, is defined by the overlapping "kinetic" fields of the movements of the inhabitants to satisfy their daily needs. (Fig.10)

Throughout human history man has been guided by the same five principles in every attempt he has made to live normally and survive:

1. The maximization of potential contacts: man tries to have the best possible contact with people and other elements such as water, food, houses, facilities, knowledge. This amounts to an operational definition of personal human freedom.

2. The minimization of effort in terms of energy, time and cost: In h attempt to maximize his potential contacts, man tries to bring everything close to him. To achieve this in the best possible way he always selects the course requiring the minimum effort.

3. Optimization of man's protective space at every moment and in every locality, whether in temporary or permanent situations, whether he is alone or part of a group.

4. Optimization of man's relationship with the other elements of his system of life, that is, with Nature, Society, Shells (buildings and houses of all sorts) and Networks (from roads to telecommunications).

Optimization of the synthesis of the previous four principles. This depends on time and space, actual conditions, and man's ability to create the synthesis. Human settlements have been more successful, made their inhabitants happier, and last longer when the fifth principle of balance between the other four has been applied.

In the present era old settlements like villages and cities (as they were structured in the past) are beginning to disappear and new ones like daily urban systems and megalopolises have begun to appear. This clearly shows that human settlements follow some evolutionary trends, which, however are not yet properly understood. The many different ways in which man has started his settlements could perhaps be called initial coincidental efforts. These he used as experiments; he learned which one served him best and then he continued with many mutations until he eventually found the right direction. What is certain is that when a more satisfactory solution appeared it was the only one that survived. We can see the truth of this statement in all types of units and at all scales of settlements.

The form, structure and texture of human settlements of all scales can be attributed to several forces deriving either from man or directly from nature.

When we move from the room -the smallest human settlement unit- (Fig to the house, the neighborhood, the city, and the metropolis, we discover that several forces are active, but their relationships change from case to case. The unit of the metropolis, for example, is too large to be influenced directly by man (in terms of his physical dimensions and senses), but it is influenced by the natural forces of gravity and geographic formation, by modes of transportation, and by the organization and growth of the system.

Following this train of thought for all categories of human settlements, we can conclude that within every type of settlement unit the changing forces of synthesis follow a certain pattern which, in terms of percentages, shows a decline of the forces derived from man's physical dimensions and personal energy, and a growth of those derived directly from nature itself as a developing and operating system. (Fig.3)

In the future human settlements will be created by man guided by the principles that he has applied so far which should not and cannot be changed.

2.   PRESENT CONDITIONS, TRENDS AND ANTICIPATIONS FOR THE YEAR 2000

The population of the earth, which has been increasing at a constantly accelerating rate until recently, is likely to continue growing well into the 21st century until a level of relative stabilization is reached. (See Appendix 1)

According to a variety of estimates the total population of the earth by the year 2000 will be between 6.3 and 7.0 billion.

Of particular importance are the phenomena of rapid urbanization (Fig.4), the very high birth rates, particularly in poor countries, which result in a disproportionately large youth population (Fig.5) and the increasing portion of aged population (over 65) in most of the rich and industrialized countries of Europe and America.

In our early forecasts - even back in the sixties - for future population distribution, major migration movements appeared highly probable to occur and last until the population distribution reaches a level of stability on a global scale. Forecasts were based on already existing trends, on easily identifiable future conflicts, on the highly probable development of awareness among people of the comparative advantages that better climatic conditions can offer and on a variety of studies dealing with economic, political, and other constraints that could lead to population movement. The discrepancy between the distribution of population and the distribution of resources probably to be exploited in the years to come has played an important role. In support of all the above, I quote from a recent publication of the Population Crisis Committee ("World Population Growth and Global Security", Population, No. 13, September 1983):

"Although not yet a major source of international tension, the steady increase in international migration (especially the un- authorized flow of political or economic refugees across common national borders) and the transnational effects of population growth on shared natural resources will inevitably contribute to localized conflict in regions of the globe as divergent as Central America, the Indian Subcontinent and West Africa."

"As rapid labor force growth compounds the problems of un- employment and underemployment in the developing world, incentives increase for people to seek better job opportu- nities by migrating, temporarily or permanently, legally or illegally. Political instability and local conflict add their share to the migrant flow. At the same time, better ac- cess to transportation and information about other countries has effectively lowered some traditional barriers to inter- national migration.

"International migration has benefited the economies of both
sending and receiving countries in many ways, but it is be-
coming clear that there are limits to the numbers of foreign
workers or refugees receiving countries are able to absorb
without precipitating serious social problems. The magnitude
of current migrant flows and their impact on host countries
are particularly apparent in the Western Hemisphere, Southern
and West Africa, South Asia and the Middle East."

"While emigrant movements are not new, the scale of present
flows is unprecedented and the capacity to absorb them is
evidently lessening among already overburdened developing
countries such as Kenya and Thailand as well as among those

industrial countries whose growth rates have slowed. The
doors have been closing for foreign workers in Western Europe
and in a number of oil-producing countries. Furthermore, in-
creasing ethnic consciousness and nationalism, whether a
reaction to economic recession or simply a function of the
present size of foreign worker populations, has produced
strong anti-immigrant sentiment over the last few years.
Incidents involving immigrants, such as the mass expulsion of
foreign workers from Nigeria and the violent Assam riots in
India, may be on the rise." (Fig. 6)

The continuation - and even accerelation - of such population
movements are highly probable for a variety of reasons. To this should
be added international migration (Sun Belt, USA, see Fig. 15), major
resettlement efforts, and others.

Accurate global figures on the total number of <u>settlements</u> on the surface of the earth by category (size, etc.) are not available. According to ACE estimates in 1970 there were about 14,300,000 settlements distributed by category as follows:

10,500,000	very small settlements
3,800,000	Villages
4,800	Polises
560	Metropolises
19	Megalopolises

Since 1950 and through the year 2000, the urban part of the total population has risen and will continue to rise very very rapidly. This rapid <u>increase</u>, of which over half is due to rural/urban migration, causes extreme demands on all "infrastructure facilities" and on services in poor countries, demands that cannot be met, in general. <u>Poverty</u> in the urban areas is growing, and a greater proportion of the poor - in developing countries - are now living in urban areas. <u>Unemployment</u> in urban areas is increasin in poor countries, since the growing labor force outnumbers the available jobs and the capacity to create them.

According to UN estimates, the population on projections for urban areas in the year 2000 for developing countries are:

-	all developing countries	41% of total
-	market economy dev. countries	42.4%
-	Latin America/Caribbean	74.8%
-	Asia	36%
-	Africa	36.9%

Between 1950-1970, the urban population in market economy developing countries rose at the annual rate of

-	Africa	5.0%
-	N. and S. America	4.5%
-	Asia	4.0%

ehereas the total national population growth rates were:

-	Africa	2.4%
-	N. and S. America	2.8%
-	Asia	2.3%

In 1970, cities of 100,000 or more - again - in market economy developing countries numbered 644:

    123   Africa
    174   Americas
    347   Asia

and projected for the year 2000, total of 1,862:

    508   Africa
    473   Americas
    873   Asia

Of the proportion of the populations in cities of more than 100,000 in the year 2000,

    75% will be in cities over 500,000
    62% will be in cities over 1 million
    30% will be in cities over 5 million

Latin America will have an especially high increase rate.

In the "Third World" cities, urban growth has caused astronomical rises in urban land prices; the 60s saw a rise of 10%-20% more than the consumer price index. For the poor who spend over 50% of their income on housing, this causes extreme hardship - either squatting, substandard housing, or forced to live farther from the central core. According to Habitat 1976, 35-60% of households in certain Third World countries cannot afford even the cheapest dwelling. (Urban Studies, 1984, No.21, Harold Lubell)

Huge slums and shantytowns from the "bustees" of Calcutta and the "bidonvilles" of Dakar to the "callampas" or "mushroom towns" of Chile and the "pueblos jovenes" around Lima have a doubling time of 5 to 10 years and contain an ever-growing proportion of the urban population, whether in the Near East, Africa, Asia or Latin America. Currently, over a third of the urban population in developing countries lives in slums and squatter settlements, most without clean water, sewerage systems or electricity.

Slums in Selected Principal Cities and Urban Doubling Times

City	Slums and squatter settlements as percent of city's population*	Urban population doubling time**
LATIN AMERICA		
Bogota (Colombia)	60 percent	22 years
Mexico City (Mexico)	46 percent	18 years
Caracas (Venezuela)	42 percent	18 years
MIDDLE EAST and AFRICA		
Addis Ababa (Ethiopia)	79 percent	11 years
Casablanca (Morocco)	70 percent	14 years
Kinshasa (Zaire)	60 percent	14 years
Cairo (Egypt)	60 percent	21 years
Ankara (Turkey)	60 percent	17 years
ASIA		
Calcutta (India)	67 percent	19 years
Manila (Philippines)	35 percent	18 years
Seoul (South Korea)	29 percent	19 years
Jakarta (Indonesia)	26 percent	19 years

*latest documented figures available, currently used by the United Nations and other expert sources, ranging from 1966 to 1981
**length of time, at current growth rate, for the country's urban population to double in size

Sources: United Nations; U.S. Agency for International Development; Municipality of Addis Ababa, 1981.

According to the UN, 40%-60% of the urban labor force works in the "informal Sector", those low-income, small-scale economic activities which receive neither recognition nor benefits from official circles.

One of the major concerns of governments, especially in poor developing countries is the large cities which "normally" grow unproportionately to the overall population growth, the overall urban growth, and especially faster than the pace of economic development - due to the difficulties in providing housing, infrastructure, education, health care, and most important of all, in creating jobs.

In 1950 there were 76 cities of over one million population, of which 24 were in Europe, 14 in North America, 13 in East Asia and the rest were located in the other five major regions of the world.

By 1975 the number of metropolitan areas of over one million had increased to 184, of which Europe had 38, East Asia 37 and North America 32 cities. (The number of cities of this category in the USSR increased from 2 (Leningrad and Moscow) to 12).

In the year 2000, according to United Nations Population Studies, there will be 437 cities of over one million population, an increase of less than 2.5 times over 1975 figures, with the highest concentration in South Asia (98 cities), followed by East Asia (83 cities), and Africa (63 cities). The highest rate of growth registered for the period 1975-2000 belongs to Africa, increasing from 11 to 63 cities, slightly less than 6 times.

The order of the 35 largest cities of the world in 1950, 1975 and 2000 is shown in Tables 1, 2 and 3 respectively.

According to the UN, the percentage of the urban population living in cities of over one million over the entire urban population of the world was 24.6 percent in 1950 (7 percent of the total population of the world) and by the year 2000 it is expected to increase to 43.4 percent.

Table 1

35 largest cities of the world, 1950
(in millions)

Rank	Name of city	Major region	Population
1	New York-N.E.N.J.	Northern America	12.3
2	London	Europe	10.4
3	Rhein-Ruhr	Europe	6.9
4	Tokyo-Yokohama	East Asia	6.7
5	Shanghai	East Asia	5.8
6	Paris	Europe	5.5
7	Gran BuenosAires	L. America	5.3
8	Chicago, N.W. Indiana	N. America	4.9
9	Moscow	USSR	4.8
10	Calcutta	South Asia	4.6
11	Los Angeles-Long Bea	N. America	4.0
12	Osaka-Kobe	East Asia	3.8
13	Milano	Europe	3.6
14	Greater Bombay	South Asia	3.0
15	Mexico City	L. Americ	3.0
16	Philadelphia- N.J.	N. America	2.9
17	Rio de Janeiro	L. America	2.9
18	Detroit, Mich.	N. America	2.8
19	Naples	Europe	2.8
20	Leningrad	USSR	2.6
21	Manchester	Europe	2.5
22	Birmingham	Europe	2.5
23	Sao Paulo	L. America	2.5
24	Cairo Biza Imbaba	Africa	2.5
25	Tientsin	East Asia	2.4
26	Boston, Mass.	N. America	2.2
27	Shenyana	East Asia	2.2
28	West Berlin	Europe	2.2
29	Peking (Beijing)	East Asia	2.2
30	San Francisco-Oaklan	N. America	2.0
31	Leeds-Bradford	Europe	1.9
32	Glasgow	Europe	1.9
33	Hamburg	Europe	1.8
34	Wien	Europe	1.8
35	Hong Kong	East Asia	1.7

Table 2

35 largest cities of the world, 1975
(in millions)

Rank	Name of city	Major region	Population
1	New York-N.E.N.J.	Northern America	19.7
2	Tokyo-Yokohama	East Asia	17.7
3	Shanghai	East Asia	12.4
4	Mexico City	Latin America	11.9
5	Los Angeles-Long Beach	Northern America	10.8
6	Sao Paulo	Latin America	10.7
7	London	Europe	10.3
8	Peking	East Asia	9.3
9	Rhein-Ruhr	Europe	9.3
10	Gran Buenos Aires	Latin America	9.3
11	Paris	Europe	9.2
12	Rio de Janeiro	Latin America	8.9
13	Osaka-Kobe	East Asia	8.7
14	Chicago, N.W. Indiana	Northern America	8.1
15	Calcutta	South Asia	7.8
16	Moscow	U.S.S.R.	7.4
17	Greater Bombay	South Asia	7.0
18	Seoul	East Asia	6.8
19	Cairo Giza Imbaba	South Asia	6.3
20	Milano	Europe	6.2
21	Jakarta	South Asia	5.7
22	Philadelphia-N.J.	Northern America	4.8
23	Detroit, Mich.	Northern America	4.8
24	Tientsin	East Asia	4.7
25	Manila	South Asia	4.5
26	Delhi	South Asia	4.4
27	Teheran	South Asia	4.2
28	Leningrad	U.S.S.R.	4.2
29	Madras	South Asia	4.1
30	Madrid	Europe	4.0
31	Karachi	South Asia	4.0
32	Hong Kong	East Asia	3.9
33	Istanbul	South Asia	3.9
34	Bangkok-Thoburi	South Asia	3.9
35	Naples	Europe	3.9

Table 3

35 largest cities of the world, 2000
(in millions)

Rank	Name of city	Major region	Population
1	Mexico City	Latin America	31.0
2	Sao Paulo	Latin America	25.8
3	Shanghai	East Asia	23.7
4	Tokio-Yokohama	East Asia	23.7
5	New York-N.E.N.J.	Northern America	22.4
6	Peking	East Asia	20.9
7	Rio de Janeiro	Latin America	19.0
8	Greater Bombay	South Asia	16.8
9	Calcutta	South Asia	16.4
10	Jakarta	South Asia	15.7
11	Los Angeles - Long Beach	Northern America	13.9
12	Seoul	East Asia	13.7
13	Cairo Giza Imbaba	South Asia	12.9
14	Madras	South Asia	12.7
15	Gran Buenos Aires	Latin America	12.1
16	Karachi	South Asia	11.6
17	Delhi	South Asia	11.5
18	Manila	South Asia	11.4
19	Teheran	South Asia	11.1
20	Baghdad	South Asia	11.0
21	Osaka-Kobe	East Asia	10.9
22	Istanbul	South Asia	10.8
23	Bangkok-Thonburi	South Asia	10.6
24	Paris	Europe	10.6
25	Dacca	South Asia	10.5
26	Bogota	Latin America	9.6
27	Chicago, N.W. Indiana	Northern America	9.3
28	London	Europe	9.2
29	Moscow	U.S.S.R.	9.0
30	Rhein-Ruhr	Europe	8.6
31	Lima-Callo	Latin America	8.6
32	Tientsin	East Asia	8.1
33	Kinshasa	Africa	8.0
34	Mileno	Europe	7.9
35	Lagos	Africa	7.7

Urban Area Expansion. Human settlements are today increasing in area more than twice as fast the rate of their population increase. The usual range of the ratio of growth rates is between 1 and 4. It is only since ca. 1920 that this ratio has become spectacularly speeded up, due to the advent of the car. This overly rapid rate of expansion in area shows signs of continuing unabated.

Expanding settlements eat up large tracts of cultivated areas as well as open nature. The most rapidly expanding settlements tend to be in lower-lying areas. In the universal process of urbanization, mountain settlements have tended to decrease in importance, compared with those on the plains. This makes the encroachment of settlement expansion over valuable soil still more dramtic. The proportion of cultivated areas directly around the urban fringe is very high, as well as the proportion of specially valuable and easily perishable food crops.

The average annual population growth rate for large settlements is ca.4.5% and the average annual growth rate for their area is just over 10%. For all settlements the average annual growth rate for their area is ca.5%. In 1960 all human settlements on the globe occupied 0.4 million sq.km: in 1976 this doubled, becoming 0.8% million sq.km. By the year 2000, it is projected to reach 2.3 million sq.km.

According to a rough preliminary estimate every year human settlements eat up about 140 thousand sq.km. of arable land, 50 thousand sq.km. of pastures, and 180 thousand sq.km. of forests. Another way of expressing the dramatic expansion of cities is to recognize that between 1970 and the year 2000 the volume of new building over the entire planet will amount to 2.5 times that existing in 1970.

Historically, most large cities were located on or near large fertile areas. To serve the growing and pressing needs of these cities, cultivation in these areas has been progressively improved, so that the proportion of highly fertile land is much higher around cities than elsewhere on the earth.

Long before any actual buildings appear, the prospect of further expansion of the city increases land prices far out of the built-up area so much that fertile agricultural land is sold in an avalanche for non-rural (urban) purposes. This means that the zone where rural land is predominant continually recedes at a very fast rate, usually to much less fertile lands.

As a result of their expansion of buildings, industry, transportation, etc., expanding cities pollute the soil in and around them to an increasing degree through their sewerage systems, garbage disposal, industrial wastes, and the spread of other soil pollutants, quite apart from the destruction of the entire soil layer over large areas.

It is true that expanding cities sometimes encourage an improvement in the standards of cultivation in their immediate vicinity. However, this is outweighed by their far larger destruction of agricultural land.

The above statement can be considered as typical of average conditions over the entire earth.

The areas where most of the future expansion of cities is likely to take place follow certain well-defined "axes of urbanization". Most of these traverse the main inland plains or develop along coastal plains. This means that the future expansion of cities is anticipated to take an increasingly heavy toll of valuable cropland, in continuation of the historical trend.

During the last four decades, parallel to the evolution of large, more or less concentrated metropolises surrounded by suburbs, and representing the largest human settlement units at that time with the continuing increase of population, the improvement of communication and transportation systems, and greater scarcity of unused habitable space, settlements in many areas became more and more interconnected until the phenomenon of urbanization on a regional scale appeared. In areas where centers relatively close to each other exceeded a critical size of some 1 million inhabitants, a belt connecting these centers was progressively urbanized through gravity effect; this belt was not continuously built-up but contained a predominance of urban functions. This process resulted in the formation of a "megalopolis - a multinuclear band formation with a population of several tens of millions and an area 10 to 1000 times larger than the area of large metropolises. (Fig.9)

On the basis of COF studies, 12 megalopolises have been identified in 1970 around the world and 6 more were in the stage of formation. (Fig.10)

Projections of megalopolis structure and growth up to the beginning of the next century, show:

- a great increase in their number; over 160 megalopolises are expected to exist around the year 2000, of which 53 will be interconnected into still larger megalopolitan networks or "urbanized regions";

- a great increase in both their average and maximum populations and areas, and a great increase in their complexity. (Fig.11,12,13)

This concept of megalopolis emerges as a smooth evolutionary result of the expanding systems of settlement patterns of the preceding periods.

These high order formations are characterized by a loose
and discontinuous internal structure in spite of their relatively
high "regional" densities. The maps show not built-up areas, but
areas of intensely urbanized character. Within these high order
formations large open areas are preserved for a variety of
purposes, such as recreation, conservation, production, etc.,
again according to a hierarchical system.

Economic projections indicate that the investment between
1960 and 2000 will probably be at least twice the cumulative
investment of the period prior to 1960, from the beginning of
history.

3.   THE PROCESS OF EVOLUTION IN THE NEXT 15 YEARS

Our studies confirm that the period between now and the year 2000 is likely to be the most difficult one for humanity; within it, a large number of difficult problems are likely to accumulate, many of which already exist. Some of the most serious are: an alarming scarcity of food, water, and other natural resources for a growing population; slow rate of growth of the economy of most of the poor countries, leading to stagnation and dissatisfaction with the increasing gap that separates them from rich countries; environmental deterioration through air, water and land pollution and widespread danger to flora and fauna; intensification of dissatisfaction due to higher expectations and lower attainments; increasing tension and stress; violence; the possible collapse of prevailing social or political systems; insufficient technological and organizational progress to cope with these problems efficiently.

Almost all, if not all, of these problems and their multiple repercussions are already manifest within human settlements, are harming them and are influencing the rate and degree of growth or deterioration of their structure, function and distribution in space. Fundamentally, these problems are causing tremendous imbalance among the basic elements of human settlements - the individual Human Being, Society in its various expressions, Constructions (Shells), Networks and Nature - in all sizes and types of settlements, and from all points of view: economic, social, political, administrative and cultural.

Furthermore, many of these problems are also "caused" by human settlements: their distribution in relation to each other, their location on the surface of the earth, their structure, their function, and growth or decline.

To give a more specific example of this cause-effect relation in human settlements, one could only refer to just a few aspects and some of the very concrete and timely issues that have attracted the attention of or are closely connected with some of the major themes of this seminar.

When we speak of the evolution of Human Settlements, we tend to consider the most advanced cases and rightly view them as the highest stage in human achievement. However, we all know that there do exist on this earth societies and settlements that were characteristic of the settlements many centuries ago, along with others - the very new, specialized settlements - that are technologically more advanced than many of the most advanced settlements in developed countries, and an abundance of settlements of various levels of evolution in between. This phenomenon will continue during the next 15 to 20 years and there is a high probability that progress in all settlements of all the levels will be much more rapid. However, the limitations are many - and are expected to last.

I assume that all of you are more familiar or more directly interested in the major settlement areas - Metropolitan and so on - where the most dramatic growth and changes have occurred and will continue to take place. By definition they are the most successful "entities" in the full spectrum of the Urban Center.

These settlements are the most dynamic, the most complex, the most expensive, the richest in opportunities, but at the same time the most problematic (in the areas of growth and change, structure and function). Governments, universities, individuals, scholars and practitioners have so far written a lot, decided a lot and implemented a lot. With the exception of a few concentrations on rural developments and small scale planning, the major effort so far has been concentrated on the Metropolitan scale settlements - the most demanding ones.

We have different and, in many cases, contradicting ideological approaches, interpretations and policies with results that are at times positive, at times negative, and not necessarily able to provide evidence of relevance. Not rarely do they confuse the real issues. While issues and problems have been extensively analyzed over years, many good policies and strategies are abandoned, and other "bad" ones replace them - policies that harm the physical structure of these settlements for "centuries" to come.

Not all major settlements of the world are equipped with networks appropriate to their scale. For example, in 1979 there were 61 metro systems in operation around the world, 22 others under construction, and 9 in the planning stage. A comparison, however, of the list of those with metro systems with the settlements with populations of over one million in Tables 1, 2 and particularly Table 3, will reveal that a large number of them do not have a metro system and have no chance of acquiring one in the period up to the year 2000. Furthermore, out of a world total of 33,000 airports (as reported by the International Civil Aviation Organization), only a few (from 200-500) are "large, commercial airports with sizeable airline service" and do not belong to, or are not able to serve adequately, the growing megalopolitan systems in their vicinity.

As all activity in human settlements takes place in space, and any decision or action implies "location" and "connection", spatial consideration within and without the settlement is of great importance.

How much do we know about the location and the connection, let us say, of "services" in metropolitan areas? How much about the appropriate "hosting" environment? Geographers, planners, architects and real estate specialists have and should show interest in this very crucial question.

Location of offices, the retail trades, medical services and educational services are the areas that until now have attracted our interest, in the form of surveys, research work, and even some theories. In North America and many western European countries - France, Netherlands, England, for example - and Japan, much experimentation and knowledge has been accumulated. The knowledge, however, on these, as well as on many other important sectors of "services" is limited concerning the spatial extent of what "we should be looking for".

Related to this very serious problem - which must increasingly preoccupy all authorities and specialists concerned about the coming "Transactional City" and the very rapidly growing "quaternary" sector of the economy - is the international debate in the arena of development on the concentration of "services" in the center versus the decentralization or relocation of "services" from the center to the periphery "which would alleviate the standing conflict and spread public expenditure more equally to other regions of the country." (For reference on these issues see Jean Gottmann's The Coming of the Transactional City, University of Maryland, Institute for Urban Studies, 1983)

Lack of knowledge, inappropriate use of knowledge, fragmented ap-
proaches, partial consideration of problems, lack of responsibility,
lack of ability for prediction, limited material and human resources -
money, material, expertise - and lack of familiarity with "new phenomena"
never experienced before, are a few of the reasons why the period
between now and the year 2000 is likely to be the most difficult one for
Human Settlements.

In the past Man has always been the dominating factor both in the
initial creation of his environment and also in maintaining a desirable balance
between the various elements. However Man now finds himself in a complex
world of limitless dimensions in which he has to cope with new problems
hitherto unimagined, and increasing at an unprecedented and threatening rate.
Studies of Human Settlements - both in the technologically advanced and in
the developing countries - show that: (1) the balance between the five elements
of human settlements has been dangerously upset, and in some respects,
irrevocably damaged during recent years; (2) while this imbalance is harming
all the elements, it is particularly hurtful to Man - the element that should
condition the environment to meet its needs; (3) despite the facilities provided
by modern technology Man seems to have lost control over the tools, created
by him, to form his environment at a human scale; (4) even worse, Man now
seems to be oblivious as to what his real needs are; what he wants to do; and
"where to go from here".

Human settlements all over the world are experiencing a period of
crisis; but they cannot be changed overnight. Their structure alone is
likely to remain largely unchanged for periods of 50 or 100 years.!

The odds are that, for the period between now and the year 2000
and for Human Settlements as well as on a global scale, some progress in
improving conditions in Human Settlements can be achieved through:

- Greater "humanization" of standards in the use of technology in
  the most advanced societies as well as the readoption of appro-
  priate "rejected" technologies, and
- The upgrading of standards in many of the poor and technologi-
  cally less advanced countries.

However, we shall definitely witness an increased inter-dependence of countries and centers through intensive "networking" via communication and transportation networks as well as a greater sharing of technological knowhow and progress, but at the same time, and unavoidably, an increasing gap between poor and rich countries.

Experience has shown that human settlements will find the correct road after many coincidental efforts or, in special cases, conscious goal-oriented efforts. Experience has also shown that this will take time, leading to many more mistakes and making people suffer over longer periods of time than is necessary.

Our challenge now is to create a goal-oriented effort representing the desires of humankind that C.A.Doxiadis used to call "our great master". To do this we must discover what the inevitable future is which has been decided by nature and man; what can be controlled by us; what the most desirable city for man is and finally how we can write the specifications for it, lay its foundations and build it. "This is our great task: to help man find his own road".

4.   NEED FOR IMMEDIATE ACTION

No matter how optimistic, pessimistic or objective our stud
may have tried to be, and no matter how high a probability their
statements or measurements have, there is no certainty that man
will find and put into effect the right solutions to some of the
very critical problems in time to save the situation. And in
time means here and now. Because whatever happens now decisively
conditions the future.

The main question - and the essence behind the whole
effort - is: should we allow the transition to the future to go
on by itself following the present trends, or should we try to
understand what is happening, conceive clearly what we want our
future to be, and then guide the forces in that direction
reducting friction as much as possible during this long period
of evolution?

No doubt, there is a need for action. There is also possibility for
efficient and immediate action which would greatly improve the overall
conditions and the quality of life in human settlements. Somewhere on the
earth examples exist of efficient methods successfully applied to solve
problems,totally or partially, but these methods are not applied elsewhere
either because they are not widely known or because they are not given
proper recognition. On the other hand, it is know and supported by many
studies that past and present failures to maintain a balanced relationship
between human settlements and natural resources result from the inability
to apply existing knowledge of processes rather than from any lack of
understanding of the processes.

There are things we can change overnight, but we never do.

There are tensions all over the globe and there are margins in all
situations for the possible release of these tensions that we never use. Instead
of trying to find a new solution to the problems, or applying old solutions
which have been unjustifiably abandoned, most of us tend to stick to fighting
urbanization - an impossible task. Urbanization seems to provide a life style
and a pattern of allocation of human effort and time which is desirable to most
humans, even if it is not recognized as such by experts. On the other hand
taming urbanization, by bringing existing rural and urban agglomerations
together into urbanized systems, is both desirable and feasible.

Satisfaction of many of the present global needs, particularly in
respect to incompatible distribution of population and resources might take
many years, many decades, before a state of equilibrium and relaxation of
tensions can be reached. But in order to do this, the process of conceiving
the magnitude of the problem, collecting the necessary data, programming,
planning, and implementation should start immediately.

4.1   Action for Settlements of all Scales

Many millions of human settlements - small and large, dynamic and static, closely or loosely connected, or enclosed in major systems - are now spread over the surface of our globe.

Type of human settlement	Population range	Estimated population	%	Estimated no. of settlements	%
very small settlement	1-100	276 million	7.7	10,440,000	73.4
village	100-5,000	1,569 million	43.6	3,747,610	26.3
polis	5,000-200,000	607 million	22.4	40,692	0.3
metropolis	200,000-10 million	455 million	12.6	560	—
megalopolis	10-500 million	490 million	13.6	19(518)*	—
total		3,597 million	100.0	14,229,380	100.0

* This 518 is an average estimate of the number of settlements included in the 19 megalo-polises. This number has been subtracted where applicable from the preceding types of human settlements.   (1970)

In the process of urbanization many of them may disappear, many may be embraced within major systems, many will definitely grow at various levels. Action in each case needs special consideration of the various dimensions of problems within the limits of the settlement itself, but also within the broader system or systems with which it is connected.

Although there are no globally valid principles to guide identical action for cities and villages with similar characteristic long worldwide experience and special studies within the frame of our research projects show that, in terms of probable priority, one could suggest specific action for prevailing problems.

On each type of settlement, there is much to say on the identification of problems, the definition of goals and objectives, both short-term and long-term (ultimate and immediate), and the establishment and implementation of policies which are consistent with the immediate goals and at the same time lead towards the ultimate ones.

4.2 Action for Urbanization Pressure Areas

The major areas shown in Fig. 9 are those that, it is believed, will experience <u>the gravest and most pressing problems</u> during the next <u>20 to 30 years</u>, both for the settlements (and systems of settlements) in them and for their total environment, in view of:

a. High densities of population (increasing with time), especially in selected core areas.

b. High total population (increasing with time).

c. Megalopolitan development, i.e. development of large independently megalopolises and, what is more important, of large interconnected systems of megalopolises (urbanized regions, or small eperopolises) that will tend to become the dominating feature within these areas. These characteristics are expected to grow spectacularly in size and complexity with time.

These major pressure areas are divided into four categories:

A. Megalopolitan systems are already developed and are evolving toward one unified complex system expected to form in them in the future. Total population and core densities are high.

B. Total population is smaller than in A; megalopolitan development is simpler (overall linear formation), but already present.

C. Megalopolitan development is still in its early phases, evolving toward several distinct megalopolitan systems which, however, have to be considered as one major unit within a unified study area because of the functional interrelations between these megalopolitan systems.

D. Same as B, but megalopolitan development still in its early phases.

Several <u>types of problems</u> can be distinguished within these pressure areas:

a. Problems of structure, function and development of the megalopolitan systems implying the need for measures leading to the proper organization and governance of these systems.

b. Problems of changing land uses, "eating up" of open land through expanding urbanization, and environmental deterioration due to growing megalopolitan systems, leading to proposals of environmental control and protection measures distinguished according to zones of increasing human intervention in the natural environment.

c. Problems of overall regional structure and development studied in the light of the growing megalopolitan systems within these areas, leading to corresponding proposals for regional control and development.

For each area, partial studies and modes of action could be devised, dealing either with specific problems (or groups of problems), or with specific sub-areas; in any case, the overall perspective of the total area, and of the entire system of problems should not be lost from sight: this means that each partial study should always be considered as part of the total one for each major study area.